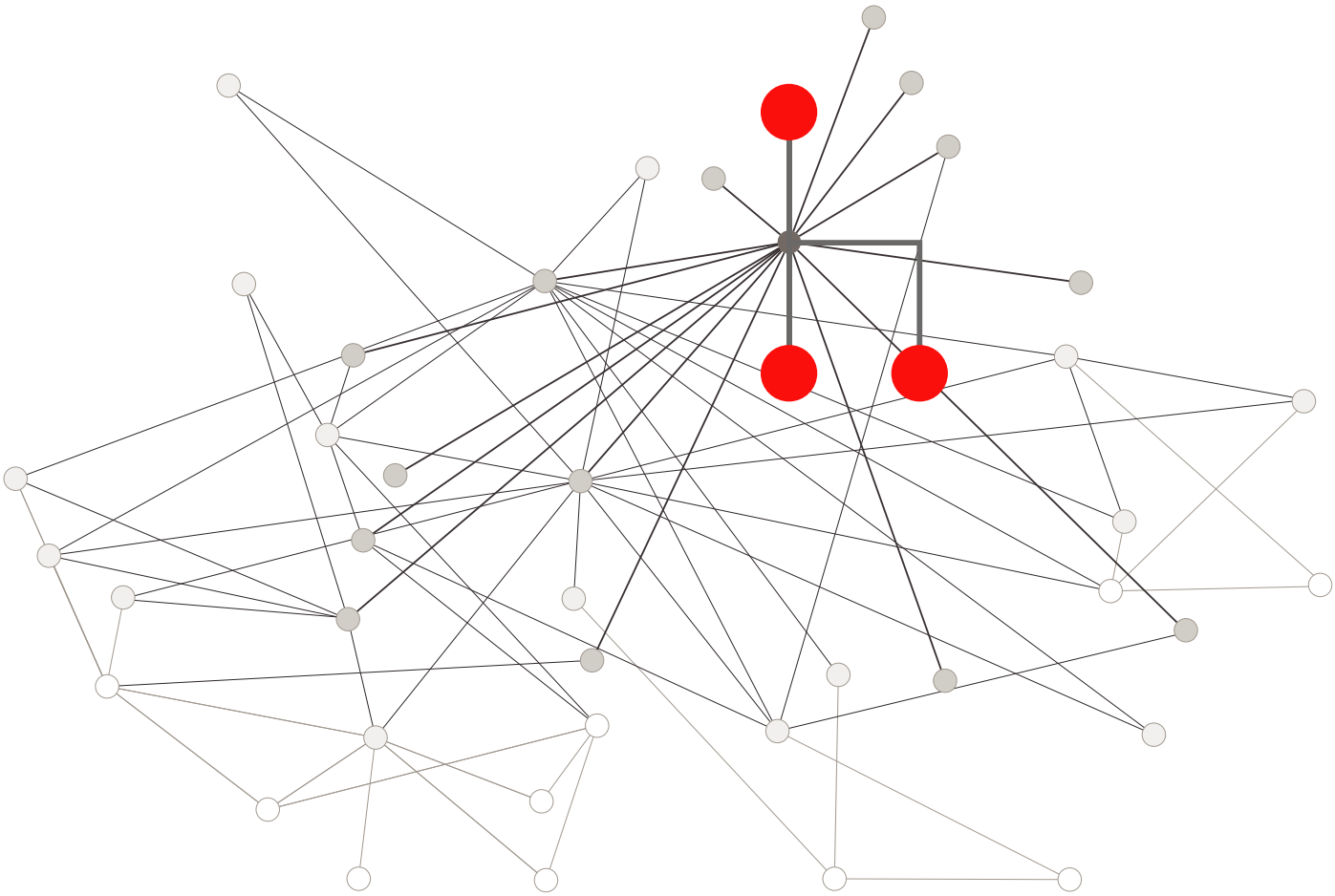

A Computational Study on Form

a Grammar-based Tool for Multipurpose Chair Design

Sara Filipe Lopes Garcia

Orientador: Doutor Luís António dos Santos Romão

Doutoramento em Design 2018

Tese especialmente elaborada para a obtenção do grau de doutor

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FACULDADE DE ARQUITETURA
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Sara Filipe Lopes Garcia

Volume II

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3 MULTIPURPOSE CHAIR SAMPLE: APPENDIXES

Appendix 3.A Subpopulations

Appendix 3.A.1 Daciano Seats Database

Designer	Name	Producer	Date	Type	Source (p.)
Costa, Daciano	for: Reitoria da ULisboa	Móveis Sousa Braga	1960-61	Chair	110
Costa, Daciano	for: Reitoria da ULisboa, Gabinete do Reitor	UNK	1960-61	Furniture Series	113
Costa, Daciano	Cortez Series	Metalúrgica da Longra	1962	Typist chair	257
Costa, Daciano	Cortez Series	Metalúrgica da Longra	1962	Drawing stool	257
Costa, Daciano	Cortez Series	Metalúrgica da Longra	1962	Office chair	257
Costa, Daciano	Cortez Series	Metalúrgica da Longra	1962	Office armchair	257
Costa, Daciano	Cortez Series	Metalúrgica da Longra	1962	Visitor's chair	257
Costa, Daciano	Cortez Series	Metalúrgica da Longra	1962	Conference chair	257
Costa, Daciano	Prestígio Series	Metalúrgica da Longra	1962	Chair & Armchair	259
Costa, Daciano	for: Banco Nacional Ultramarino	Móveis Sousa Braga	1963	Seating system	235
Costa, Daciano	TL Series	Metalúrgica da Longra	1964-65	Easy Chair, Sofa & Coffee Table	261
Costa, Daciano	for: Biblioteca Nacional de Lisboa, Sala de leitura	UNK	1965-68	Library Chair & Table	125
Costa, Daciano	for: Biblioteca Nacional de Lisboa, Salão nobre	UNK	1965-68	Chair & Conference Table	125
Costa, Daciano	for: Biblioteca Nacional de Lisboa, Gabinete do director	UNK	1965-68	Easy chair & Side Table	125
Costa, Daciano	for: Casino do Estoril, Salão Restaurante	Olaio	1966-67	Chair	130
Costa, Daciano	for: Casino do Estoril, Boîte	Móveis Sousa Braga	1966-67	Chair & Table	130
Costa, Daciano	Alvor-Grill (Habitat 70)	Móveis Sousa Braga (reissued by M. Longra)	1966-68	Chair & Table	144,187, 243
Costa, Daciano	for: Hotel Alvor Praia; Coffee-shop da piscina	Móveis Sousa Braga	1966-68	Chair	144
Costa, Daciano	Costureira (Habitat 70)	Móveis Sousa Braga	1969-70	Chair	242
Costa, Daciano	MA1 (Habitat 70)	Móveis Sousa Braga	1969-70	Easy chair	243
Costa, Daciano	CB2 (Habitat 70)	Móveis Sousa Braga	1969-70	Armchair	243
Costa, Daciano	ME1 (Habitat 70)	Móveis Sousa Braga	1969-70	Table	243
Costa, Daciano	CA1 (Habitat 70)	Móveis Sousa Braga	1969-70	Chair	243
Costa, Daciano	Palace	Móveis Sousa Braga (reissued by Uniforma)	1970-71	Chair	147
Costa, Daciano	Quadratura Series (for: LNEC, CCB)	Metalúrgica da Longra	1971 (1990-92)	Chair, Stool & Table	155, 187
Costa, Daciano	Dfi Series	Metalúrgica da Longra	1971	Office Chair, Desks & Cabinets	267
Costa, Daciano	for: LNEC, Sala de Congressos	Metalúrgica da Longra	1971-72	Chair	154
Costa, Daciano	for: Hotel Altis, Quarto-tipo	UNK	1971-74	Chair	159
Costa, Daciano	for: Hotel Penta, Restaurante	Móveis Sousa Braga	1971-75	Chair	164
Costa, Daciano	Mitnova Series	Metalúrgica da Longra	1975	Office Desks & Cabinets	271
Costa, Daciano	Tripeça	Móveis Sousa Braga	1972-77	Chair	169
Costa, Daciano	for: Casino Park Hotel, Bar	UNK	1972-84	Easy chair	172
Costa, Daciano	for: Fundação Calouste Gulbenkian; Sala de Jantar da Direcção	UNK	1966-69; 1999-01	Armchair & Table	137
Costa, Daciano	Boroa 1	Sunviauto	1990-92	Easy chair & Side Table	182
Costa, Daciano	Boroa 2	Sunviauto	1990-92	Easy chair	182
Costa, Daciano	for: CCB, Grande Auditório	Olaio (reedição DDI 1996)	1990-92	Chair	185
Costa, Daciano	for: CCB, Sala de jantar da Presidência	Olaio	1990-92	Chair	187

Costa, Daciano	Coliseu/Orquestra	Móveis Viriato	1993-94	Chair	189
Costa, Daciano	Coliseu/Café	Julcar	1993-94	Chair	191
Costa, Daciano	Fradique	Julcar	1993-95	Bench	209
Costa, Daciano	Tabuado	Julcar	1993-95	Bench	211
Costa, Daciano	Penta Series	Julcar	1994-95	Sled chair	280
Costa, Daciano	Penta Series	Julcar	1994-95	Swivelling chair	280
Costa, Daciano	Ribeirinho	N/A	1996	Bench	218
Costa, Daciano	Flora	N/A	1996	Bench	218
Costa, Daciano	Bandarra	N/A	1996	Bench	220
Costa, Daciano	Sudeste	N/A	1996	Bench	220
Costa, Daciano	for: Edifício dos Paços do Concelho de Lisboa; Sala de sessões públicas	Ângelo de Sousa Braga	1997-98	Chair	192
Costa, Daciano	for: Edifício dos Paços do Concelho de Lisboa; Gabinete do Presidente	Ângelo de Sousa Braga	1997-98	Chair & Conference Table	197
Costa, Daciano	Sancho Series	Ângelo de Sousa Braga	1997-99	Chair, Armchair & Table	285
Costa, Daciano	for: Crowne Plaza Resort (Madeira), Quarto-tipo	Ângelo de Sousa Braga	1998-00	Chair	199
Costa, Daciano	for: Crowne Plaza Resort (Madeira), Quarto-tipo	Ângelo de Sousa Braga	1998-00	Easy chair	199
Costa, Daciano	Daciano da Costa (for: Centro Histórico de Beja)	Larus	2004	Bench	233
TOTAL					**53**

Legend: Sample chairs

Source:

Daciano da Costa: designer – exhibition catalogue (Martins 2001).

Appendix 3.A.2 Morrison Seats Database

Designer	Name	Producer	Date	Type
Morrison, Jasper	1''	Emeco	2017	Chair
Morrison, Jasper	Kile	Fredericia	2017	Sofa
Morrison, Jasper	Riva	Kettal	2016	Easy chair
Morrison, Jasper	APC	Vitra	2016	Chair
Morrison, Jasper	T1	Maruni	2016	Chair
Morrison, Jasper	Duos	Andreu World	2016	Chair
Morrison, Jasper	Soft	Vitra	2016	Sofa
Morrison, Jasper	O-Stool	Maruni	2016	Stool
Morrison, Jasper	December	Nikari	2016	Easy chair
Morrison, Jasper	Bankside	B&B Italia	2016	Easy chair
Morrison, Jasper	Occasional	Vitra	2016	Easy chair
Morrison, Jasper	Alfi	Emeco	2015	Chair
Morrison, Jasper	Kali	Offecct	2015	Chair
Morrison, Jasper	Hal	Vitra	2011-14	Chair & Armchair
Morrison, Jasper	Unos	Andreu World	2014	Chair
Morrison, Jasper	Orla	Cappellini	2014	Easy chair & Sofa
Morrison, Jasper	Bruno	Maruni	2014	Sofa
Morrison, Jasper	Cap	Cappellini	2013	Armchair
Morrison, Jasper	Fionda	Mattiazzi	2013	Folding chair
Morrison, Jasper	Village	Kettal	2013	Armchair
Morrison, Jasper	Botan	Maruni	2013	Bench
Morrison, Jasper	Lightwood	Maruni	2011-13	Chair & Armchair
Morrison, Jasper	Park Life	Kettal	2012	Series
Morrison, Jasper	Kamado Shrine	UNK	2012	Bench
Morrison, Jasper	Tagliatelle	Alias	2011	Chair
Morrison, Jasper	Camp	Cappellini	2010	Sofa
Morrison, Jasper	Trattoria	Magis	2009	Chair
Morrison, Jasper	Bac	Cappellini	2009	Armchair
Morrison, Jasper	Basel	Vitra	2008	Chair
Morrison, Jasper	Place	Vitra	2008	Sofa
Morrison, Jasper	Pipe	Magis	2008	Chair
Morrison, Jasper	Monopod	Vitra	2008	Chair
Morrison, Jasper	Lotus	Cappellini	2006	Office chair
Morrison, Jasper	Wooden Furniture	Muji	2005	Chair, Table & Shelf
Morrison, Jasper	Air	Magis	1999-2005	Armchair, Folding chair & Chair
Morrison, Jasper	Park	Vita	2004	Sofa
Morrison, Jasper	Soft Sim	Vitra	2004	Chair
Morrison, Jasper	Lac	Cappellini	2004	Chair
Morrison, Jasper	Superblong	Cappellini	2004	Sofa
Morrison, Jasper	Morrison Stool	Cappellini	2003	Stool
Morrison, Jasper	Tate	Cappellini	2000	Chair
Morrison, Jasper	Low Pad	Cappellini	1999	Easy chair
Morrison, Jasper	Elan	Cappellini	1999	Sofa
Morrison, Jasper	Slim	Vitra	1999	Chair
Morrison, Jasper	Hi Pad	Cappellini	1999	Chair
Morrison, Jasper	La Tourette	Hubert Weinzierl	1998	Chair
Morrison, Jasper	Orly	Cappellini	198	Sofa
Morrison, Jasper	Vega	Artifort	1997	Chair
Morrison, Jasper	Lima	Cappellini	1996	Folding chair

Morrison, Jasper	Sofa	Vitra	1993	Sofa
Morrison, Jasper	3 Sofa Deluxe	Cappellini	1991	Sofa
Morrison, Jasper	Bench Family	Vitra	1989	Bench
Morrison, Jasper	Plywood	Vitra	1988	Chair
Morrison, Jasper	Thinking Man's Chair	Cappellini	1986	Easy chair
Morrison, Jasper	Slatted	SCP	1983-86	Stool
TOTAL				**55**

Legend:	Sample chairs

Source:

Jasper Morrison official web page – seating projects (Morrison 2017)

Appendix 3.A.3 Iconic Seats Database

Product					Sources (p.)					
Designer	**Name**	**Producer**	**Date**	**Type**	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**
Aalto, Alvar	No. 406	Artek	1938-39	Easy chair	36	N/A	N/A	165	N/A	N/A
Aalto, Alvar	No. F35	Artek	1930	Chair	N/A	N/A	N/A	160	N/A	N/A
Aalto, Alvar	No. 31	Artek	1931-32	Easy chair	N/A	N/A	44	161	N/A	N/A
Aalto, Alvar	No. 37	Artek	1935-36	Easy chair	N/A	N/A	N/A	162	N/A	N/A
Aalto, Alvar	No. 44	Artek	1935-36	Easy chair	N/A	N/A	N/A	162	N/A	N/A
Aalto, Alvar	Paimio	Artek	1930-31	Easy chair	30	138	42	163	19	56
Aalto, Alvar	No. 43/39	Artek	1936	Lounge chair	N/A	140	N/A	165	21	N/A
Aalto, Alvar	No. 60	Artek	1932-33	Stool	32	N/A	46	164	20	N/A
Aalto, Alvar	Y-leg	Artek	1946-47	Stool	N/A	N/A	N/A	201	N/A	N/A
Aalto, Alvar	X600, X601	Artek	1954	Stool	N/A	N/A	N/A	266	N/A	N/A
Aalto, Alvar	No. 69	Artek	1933	Chair	N/A	N/A	N/A	164	20	N/A
Aarnio, Eero	Pony	Stending	1970	Child's chair	N/A	N/A	N/A	471	N/A	N/A
Aarnio, Eero	Pastille	Adelta	1967-68	Easy chair	N/A	N/A	N/A	367	24	105
Aarnio, Eero	Cognac	Asko	1967	Easy chair	N/A	N/A	N/A	368	22	N/A
Aarnio, Eero	Ball (Globe)	Adelta	1963-65	Easy chair	N/A	N/A	162	369	23	93
Aarnio, Eero	Tomato	Adelta	1971	Easy chair	N/A	N/A	N/A	428	N/A	N/A
Aarnio, Eero	Bubble	Adelta	1968	Hanging chair	N/A	N/A	168	369	N/A	N/A
Albini, Franco	Fiorenza	Arflex	1952	Easy chair	N/A	N/A	N/A	296	25	N/A
Albini, Franco	Gala	Vittorio Bonacina & C.	1950	Easy chair	N/A	N/A	N/A	297	N/A	N/A
Albinson, Don	Albinson No. 601	Knoll	1965	Stacking chair	N/A	N/A	N/A	338	N/A	N/A
Amat, D.T.	Indiana	Amat	1975	Garden chair	N/A	N/A	N/A	458	N/A	N/A
Ambasz, Emilio; Piretti, Giancarlo	Vertebra	Castelli	1977	Office chair	N/A	N/A	N/A	453	N/A	N/A
Andersen, Gunnar	Prototype	Andersen, Gunnar	1952-53	Atrwork	N/A	N/A	N/A	305	N/A	N/A
Arad, Ron	Well Tempered	Vitra	1986	Easy chair	N/A	130	N/A	N/A	N/A	N/A
Arad, Ron	Schizzo	Vitra	1989	Chair	N/A	N/A	N/A	535	N/A	N/A
Arad, Ron	Empty	Driade	1993	Chair	N/A	N/A	N/A	565	N/A	N/A
Arad, Ron	FPE	Kartell	1997	Chair	98	N/A	N/A	N/A	N/A	N/A
Arad, Ron	Rover	One Off	1981	Easy chair	84	N/A	178	502	26	116
Arad, Ron	Big Easy Volume	One Off	1989	Easy chair	N/A	N/A	N/A	541	N/A	126
Arad, Ron	After Spring/Before Summer	One Off	1992	Lounge chair	N/A	N/A	N/A	542	N/A	N/A
Arad, Ron	Creature Comfort	One Off	1992	Lounge chair	N/A	N/A	N/A	542	N/A	N/A
Arad, Ron	Doubletake	One Off	1992	Lounge chair	N/A	N/A	N/A	543	N/A	N/A
Arad, Ron	Up Like A Bear	One Off	1992	Lounge chair	N/A	N/A	N/A	543	N/A	N/A
Archizoom Associati	Safari	Poltronova	1968	Livingscape	N/A	N/A	N/A	414	27	N/A
Archizoom Associati	Mies	Poltronova	1969	Lounge chair	N/A	222	N/A	415	N/A	N/A
Archizoom Associati	Superonda	Poltronova	1966	Sofa	N/A	N/A	N/A	409	N/A	98
Armgardt, Jan	No. JA43G	Katz-Flechtmöbel	1991	Chair	N/A	N/A	N/A	564	N/A	N/A
Arosio, Pietro	Mirandolina, No. 2068	Zanotta	1992	Stacking chair	N/A	N/A	N/A	552	N/A	N/A
Arribas, Alfredo	Jane Greystoke	Carlos Jané Camacho	1990	Chair	N/A	N/A	N/A	558	N/A	130
Artschwager, Richard	Chair/Chair	Vitra	1986-87	Easy chair	N/A	N/A	N/A	525	N/A	N/A
Atfied, Jane	RCP 2	Made of Waste	1992	Chair	N/A	N/A	N/A	588	N/A	N/A
Aulenti, Gae	Aulenti Collection, No. 54A	Knoll	1975	Easy chair	N/A	N/A	N/A	446	N/A	N/A
Aulenti, Gae	April, No. 210	Zanotta	1964	Folding chair	N/A	N/A	N/A	336	N/A	N/A
Bätzner, Helmut	Bofinger, No. BA 1171	Wilhelm Bofinger	1964-66	Chair	N/A	46	N/A	374	28	N/A
Behrens, Peter	Armchair for Behrens House	Hofmöbelfabrik	1900-01	Armchair	N/A	N/A	N/A	56	N/A	N/A
Behrens, Peter	Wertheim chair	Anton Blüggel	1902	Chair	N/A	N/A	N/A	59	N/A	N/A

Behrens, Till	Kreuzschwinger	Schlubach	1983	Chair	N/A	N/A	N/A	504	N/A	N/A
Behrens, Till	Schalenschwinger	Hinrich Praefke	1992	Easy chair	N/A	N/A	N/A	505	N/A	N/A
Bellini, Mario	Cab, No. 412	Cassina	1976	Chair	N/A	98	N/A	444	29	114
Bellini, Mario	Amanta	Herman Miller	1966	Easy chair	N/A	N/A	N/A	345	N/A	N/A
Bellini, Mario	La Bambole	B & B Italia	1972	Easy chair	N/A	N/A	N/A	440	N/A	N/A
Bellini, Mario	Break, No. 401	Cassina	1976	Easy chair	N/A	N/A	N/A	445	N/A	N/A
Bellini, Mario	Teneride	Cassina	1968	Artwork	N/A	N/A	N/A	379	N/A	N/A
Bellini, Mario; Thiel, Dieter	Imago	Vitra	1984	Office chair	N/A	N/A	N/A	510	N/A	N/A
Bellini, Mario; Thiel, Dieter	Figura	Vitra	1985	Office chair	N/A	N/A	N/A	511	N/A	N/A
Bellmann, Hans	Chair	AG Möbelfabrik	1952	Chair	N/A	N/A	N/A	271	N/A	N/A
Belotti, Giandomenico	Spaghetti	Alias	1979	Chair	N/A	N/A	N/A	464	N/A	N/A
Beltzig, Günter	Floris	Galerie Objekte	1967	Chair	N/A	N/A	N/A	375	N/A	100
Bertoia, Harry	No. 420C	Knoll	1950-52	Chair	N/A	N/A	N/A	254	N/A	N/A
Bertoia, Harry	Bird	Knoll	1950-52	Easy chair & Ottoman	N/A	N/A	98	254	N/A	N/A
Bertoia, Harry	Diamond	Knoll	1950-52	Easy chair	48	86	100	255	30	70
Bey, Jurgen	Tree Trunk	Droog	2000	Bench	102	N/A	N/A	N/A	N/A	N/A
Bill, Max	Ulmer Hocker	Zanotta	1954	Stool	N/A	N/A	N/A	268	N/A	N/A
Binfaré, Francesco	L'Homme et la Femme	Edra	1996	Sofa	N/A	N/A	N/A	602	N/A	N/A
Binfaré, Francesco	Tangeri Bed	Edra	1996	Sofa	N/A	N/A	N/A	603	N/A	N/A
Binfaré, Francesco; Magistertti, Vico	Insica	De Padova	1992	Office chair	N/A	N/A	N/A	576	N/A	N/A
Blanca, Oscar	Gaulino	Carlos Jané Camacho	1987	Stacking chair	N/A	N/A	N/A	544	N/A	N/A
Bloc, André	Bellevue	UNK	1951	Chair	N/A	118	N/A	N/A	N/A	N/A
Blumer, Riccardo	Laleggera	Alias	1993-96	Stacking chair	N/A	N/A	N/A	554	N/A	N/A
Boeri, Cini	Bobo	Arflex	1967	Easy chair	N/A	N/A	N/A	399	N/A	N/A
Boeri, Cini	Serpentone	Arflex	1971	Sofa	N/A	N/A	N/A	423	N/A	N/A
Boeri, Cini; Katayanagi, Tomu	Ghost	Fiam	1987	Easy chair	N/A	N/A	N/A	526	N/A	N/A
Bonetti, Mattia; Garouste, Elisabeth	Prince Imperiale	Néotù	1985	Artwork	N/A	N/A	N/A	531	N/A	N/A
Bonetto, Rodolfo	Melamina	Driade	1970	Easy chair	N/A	N/A	N/A	424	N/A	N/A
Booth, Sam	Oritetsu	L.W.D.	1996	Stacking chair	N/A	N/A	N/A	589	N/A	N/A
Borsani, Osvaldo	No. P40	Tecno	1954	Lounge chair	N/A	N/A	N/A	290	31	73
Borsani, Osvaldo	No. D70	Tecno	1954	Sofa	N/A	N/A	N/A	291	32	N/A
Botta, Mario	Seconda	Alias	1982	Chair	N/A	N/A	180	506	N/A	117
Bottoni, Piero	Lira	Zanotta	1934	Chair	N/A	N/A	N/A	153	N/A	N/A
Bouroullec, Ronan; Bourollec, Erwan	Samourai	Cappellini	2002	Armchair	104	N/A	N/A	N/A	N/A	N/A
Branzi, Andrea	Century	Memphis	1982	Divan	N/A	N/A	N/A	485	N/A	N/A
Branzi, Andrea	Niccola	Zanotta	1992	Easy chair & Ottoman	N/A	N/A	N/A	585	N/A	N/A
Branzi, Andrea	Animali Domestici	Zabro	1985	Artwork	N/A	232	N/A	UNK*	N/A	N/A
Breuer, Marcel	Slatted chair	Furniture Workshop	1922-24	Armchair	N/A	N/A	N/A	99	N/A	N/A
Breuer, Marcel	Cesca, No. B64	Knoll	1928	Armchair	N/A	28	N/A	109	35	52
Breuer, Marcel	No. B6	Standard-Möbel	1926-27	Chair	N/A	N/A	N/A	104	N/A	N/A
Breuer, Marcel	No. B33	Thonet	1927-28	Chair	N/A	N/A	N/A	108	34	N/A
Breuer, Marcel	Cesca, No. B32	Knoll	1928	Chair	26	N/A	28	109	35	52
Breuer, Marcel	No. 301	Embru	1932-34	Chair	N/A	N/A	N/A	166	36	N/A
Breuer, Marcel	for: Sommerfeld House	Furniture Workshop	1921	Easy chair	N/A	N/A	N/A	101	N/A	N/A
Breuer, Marcel	Wassily, No. B3	Knoll	1925-27	Easy chair	20	212	20	105	33	48
Breuer, Marcel	No. B25	Thonet	1928-29	Easy chair	N/A	N/A	N/A	110	N/A	N/A
Breuer, Marcel	No. B35	Thonet	1928-29	Easy chair	N/A	74	N/A	111	N/A	N/A
Breuer, Marcel	No. 313	Embru	1935-34	Lounge chair	N/A	30	N/A	167	37	N/A
Breuer, Marcel	Isokon armchair	Isokon	1936	Easy chair	N/A	N/A	N/A	169	39	N/A

Breuer, Marcel	Isokon chaise longue	Isokon	1935-36	Lounge chair	N/A	N/A	54	168	38	N/A
Breuer, Marcel	Isokon chair	Isokon	1936-37	Stacking chair	N/A	N/A	N/A	170	N/A	N/A
Breuer, Marcel	Couch	Tecta	1930-31	Sofa	N/A	N/A	N/A	118	N/A	N/A
Brown, Ford	Sussex	Morris & Co.	1864-65	Armchair	N/A	N/A	N/A	33	40	N/A
Bugatti, Carlo	Bench	Buggati, Carlo	1900	Bench	N/A	N/A	N/A	47	41	N/A
Bugatti, Carlo	Cobra	Buggati, Carlo	1902	Artwork	N/A	N/A	N/A	46	N/A	N/A
Carabin, François-Rupert	Chair	Carabin, François-R.	1896	Artwork	N/A	N/A	N/A	38	N/A	N/A
Casciani, Stefano	Albertina	Zanotta	1983-84	Easy chair	N/A	N/A	N/A	492	N/A	N/A
Castiglioni, Achille	Irma, No. 2280	Zanotta	1979	Chair	N/A	N/A	N/A	459	N/A	N/A
Castiglioni, Achille	Primate	Zanotta	1970	Kneeling stool	N/A	N/A	N/A	427	N/A	N/A
Castiglioni, Achille; Castiglioni, Pier	Spluga	Zanotta	1960	Chair	N/A	N/A	N/A	318	N/A	N/A
Castiglioni, Achille; Castiglioni, Pier	Sanluca	Bernini	1959	Easy chair	N/A	N/A	N/A	304	N/A	88
Castiglioni, Achille; Castiglioni, Pier	Mezzadro	Zanotta	1957	Stool	58	216	120	310	42	82
Castiglioni, Achille; Castiglioni, Pier	Sella	Zanotta	1957	Stool	N/A	N/A	N/A	311	43	N/A
Castiglioni, Achille; Castiglioni, Pier	Allunaggio	Zanotta	1966	Stool	N/A	N/A	N/A	319	N/A	N/A
Castle, Wendell	Molar chair	Beylerian	1969	Chair	N/A	N/A	N/A	372	44	N/A
Castle, Wendell	Chair with Sports Coat	Castle, Wendell	1978	Artwork	N/A	N/A	N/A	467	N/A	N/A
Castle, Wendell	Molar sofa	Beylerian	1969	Sofa	N/A	N/A	N/A	373	45	110
Chadwick, Donald; Stumpf, William	Equa	Herman Miller	1984	Office chair	N/A	N/A	N/A	521	N/A	N/A
Chadwick, Donald; Stumpf, William	Aeron	Herman Miller	1992	Office chair	96	N/A	N/A	551	46	N/A
Chareau, Pierre	No. MC767	Chareau, Pierre	1927	Chair	N/A	N/A	N/A	139	N/A	N/A
Chareau, Pierre	No. MF158	Chareau, Pierre	1928	Easy chair	N/A	N/A	N/A	138	N/A	N/A
Cherner, Norman	Cherner	Plycraft	1958	Chair	N/A	N/A	128	256	N/A	N/A
Citterio, Antonio	Compagnia delle Filippine	B & B Italia	1993	Easy chair	N/A	N/A	N/A	578	N/A	N/A
Citterio, Antonio; Löw, Glen	Dolly	Kartell	1996	Folding chair	N/A	N/A	N/A	595	N/A	N/A
Citterio, Antonio; Löw, Glen	Citterio Collection, No. AC1	Vitra	1990	Office chair	N/A	N/A	N/A	549	N/A	N/A
Colani, Luigi	Zocker	Top System	1971-72	Child's chair	N/A	170	N/A	429	47	N/A
Colombo, Joe	LEM	Bieffeplast	1964	Easy chair	N/A	N/A	N/A	352	N/A	N/A
Colombo, Joe	No. 4801	Kartell	1963-64	Easy chair	N/A	N/A	N/A	353	49	N/A
Colombo, Joe	Elda	Comfort	1963-65	Easy chair	N/A	N/A	158	361	48	N/A
Colombo, Joe	Additional Living System	Sormani	1967-68	Lounge chair	N/A	N/A	N/A	354	N/A	104
Colombo, Joe	Tube	Flexform	1969-70	Lounge chair	N/A	N/A	N/A	360	N/A	N/A
Colombo, Joe	Universale	Kartell	1965-67	Stacking chair	64	N/A	N/A	364	50	94
Colombo, Joe	Birillo	Zanotta	1969-70	Bar stool	74	N/A	172	355	N/A	N/A
Colombo, Joe	Multi chair	Sormani	1970	Multi chair	N/A	N/A	N/A	439	N/A	N/A
Colwell, David	Contour	4'S Company	1968	Easy chair	N/A	N/A	N/A	382	N/A	N/A
Coop Himmelblau	Vodöl	Vitra	1989	Artwork	N/A	234	N/A	N/A	N/A	N/A
Coray, Hans	Landi	Vitra	1938	Chair	38	34	N/A	192	51	61
Corretti, Gilberto; Deganello, Paolo	Archizoom Uno	Marcatré	1973	Office chair	N/A	N/A	N/A	448	N/A	N/A
Cortes, Pepe	Gracia	Punt Mobles	1991	Bench	N/A	N/A	N/A	547	N/A	N/A
Dalí, Salvador	Hands chair	Arthur English	1936	Artwork	N/A	N/A	N/A	188	N/A	N/A
Dalí, Salvador	Mae West sofa	Green & Abbott	1936	Sofa	N/A	N/A	N/A	189	N/A	N/A
Dalisi, Riccardo	Pavone	Zanotta	1986	Artwork	N/A	N/A	N/A	490	N/A	N/A
Davis, James; Walley, David	Chair 9 & 10	Yellow Diva	1996	Easy chair	N/A	N/A	N/A	600	N/A	N/A
Day, Robin	Polyprop	Hille	1962-63	Chair	62	N/A	146	327	53	92
Day, Robin	Hillestak	Hille	1950	Stacking chair	N/A	N/A	N/A	236	N/A	N/A
de Feure, Georges	for the Paris Exposition	Siegfried Bing	1900	Sofa	N/A	N/A	N/A	40	N/A	N/A
De Lucchi, Michele	First	Memphis	1983	Chair	N/A	226	N/A	483	54	119

De Lucchi, Michele	Lido	Memphis	1982	Sofa	N/A	N/A	N/A	484	N/A	N/A
De Pas, Gionatan; D'Urbino, Donato; Lomazzi, Paolo	Linda	Zanotta	1975	Chair	N/A	N/A	N/A	461	N/A	N/A
De Pas, Gionatan; D'Urbino, Donato; Lomazzi, Paolo	Duecavalli	Driade	1969	Easy chair	N/A	N/A	N/A	337	N/A	N/A
De Pas, Gionatan; D'Urbino, Donato; Lomazzi, Paolo	Joe	Poltronova	1970	Easy chair	N/A	N/A	N/A	422	56	111
De Pas, Gionatan; D'Urbino, Donato; Lomazzi, Paolo; Scolari, Carla	Blow	Zanotta	1967	Easy chair	66	48	N/A	413	55	102
Dean, Roger	Sea Urchin	Hille	1968	Beanbag	N/A	N/A	N/A	402	N/A	N/A
Deganello, Paolo	Re	Zanotta	1991	Chair	N/A	N/A	N/A	580	N/A	N/A
Deganello, Paolo	AEO, No. 650	Cassina	1973	Easy chair	N/A	96	N/A	494	N/A	N/A
Deganello, Paolo	Torso, No. 654	Cassina	1982	Easy chair	N/A	N/A	N/A	495	N/A	N/A
Design 134	Airport	Ibra	1989	Bench	N/A	N/A	N/A	546	N/A	N/A
di Belgiojoso, Ludovico; Peresutti, Enrico	Elettra	Arflex	1953	Easy chair	N/A	N/A	N/A	295	N/A	N/A
Dieckmann, Erich	Chair and Armchair	Furniture Workshop	1926	Chair & Armchair	N/A	N/A	N/A	102	N/A	N/A
Dieckmann, Erich	Armchair	Furniture Workshop	1926	Easy chair	N/A	N/A	N/A	103	57	N/A
Diffrient, Niels	Diffrient Operational	Knoll	1980	Office chair	N/A	N/A	N/A	520	N/A	N/A
Dillon, Jane; Wheeler, Peter	Multipla	Kron	1992	Easy chair	N/A	N/A	N/A	583	N/A	N/A
Ditzel, Nanna	Egg	Sika Design	1957	Hanging chair	N/A	N/A	124	N/A	N/A	N/A
Dixon, Tom	Kitchen	Space	1987	Artwork	N/A	N/A	N/A	528	N/A	N/A
Dixon, Tom	S	Cappellini	1988	Chair	92	N/A	190	529	N/A	127
Dixon, Tom	Bird	Cappellini	1992	Lounge chair	N/A	N/A	198	573	N/A	N/A
Dixon, Tom	Bird 2	Cappellini	1992	Chair	N/A	N/A	N/A	573	N/A	N/A
Dixon, Tom	Pylon	Cappellini	1991	Artwork	N/A	N/A	N/A	572	N/A	N/A
Dresser, Christopher	Armchair	Chubb & Sons	1880	Easy chair	N/A	N/A	N/A	34	N/A	N/A
du Pasquier, Nathalie	Royal	Memphis	1983	Lounge chair	N/A	N/A	N/A	487	N/A	N/A
Dubreuil, André	Spine	A. D. Decorative Arts Ltd.	1988	Easy chair	N/A	N/A	N/A	N/A	N/A	124
Eames, Charles & Ray	DAX	Herman Miller	1948	Armchair	N/A	150	N/A	N/A	N/A	N/A
Eames, Charles & Ray	Children's chair	Evans Products Co.	1945	Child's chair	N/A	36	N/A	N/A	N/A	N/A
Eames, Charles & Ray	LCW/DCW	Herman Miller	1945	Easy chair	40	144	60	196	58	N/A
Eames, Charles & Ray	LCM	Herman Miller	1945-46	Easy chair	N/A	N/A	N/A	197	59	64
Eames, Charles & Ray	La Chaise	Vitra	1948	Lounge chair	N/A	152	64	217	60	N/A
Eames, Charles & Ray	DAR	Herman Miller	1948-50	Armchair	42	N/A	N/A	219	61	71
Eames, Charles & Ray	RAR	Herman Miller	1948-50	Rocking chair	N/A	N/A	66	218	N/A	N/A
Eames, Charles & Ray	DSX	Herman Miller	1950	Chair	N/A	N/A	84	N/A	N/A	N/A
Eames, Charles & Ray	DKW	Herman Miller	1951	Chair	N/A	N/A	N/A	274	62	N/A
Eames, Charles & Ray	DKR	Herman Miller	1951	Chair	46	40	N/A	275	N/A	N/A
Eames, Charles & Ray	Sofa Compact	Herman Miller	1954	Sofa	N/A	N/A	N/A	280	N/A	N/A
Eames, Charles & Ray	No. 670 & No. 671	Herman Miller	1956	Easy chair & Ottoman	56	90	116	277	63	80
Eames, Charles & Ray	Aluminium Group, No. EA 105	Herman Miller	1958	Office chair	N/A	N/A	N/A	278	64	86
Eames, Charles & Ray	Aluminium Group, No. 684	Herman Miller	1958	Swivel chair	N/A	42	N/A	N/A	N/A	N/A
Eames, Charles & Ray	Aluminium Group, No. EA 117	Herman Miller	1958	Office chair	N/A	N/A	N/A	279	N/A	N/A
Eames, Charles & Ray	Time-Life stools	Herman Miller	1960	Stool	N/A	N/A	N/A	321	N/A	N/A
Eames, Charles & Ray	La Fonda	Herman Miller	1961	Chair	N/A	N/A	N/A	328	N/A	N/A
Eames, Charles & Ray	Tandem Shell Seating	Herman Miller	1962-63	Seating system	N/A	N/A	N/A	330	N/A	N/A
Eames, Charles & Ray	Tandem Shell Seating	Herman Miller	1962	Seating system	N/A	N/A	N/A	331	N/A	N/A
Eames, Charles & Ray	No. ES 106	Herman Miller	1968	Lounge chair	N/A	N/A	N/A	332	N/A	N/A
Eames, Charles & Ray	Soft Pad, No. EA 435	Herman Miller	1969	Office chair	N/A	N/A	170	333	N/A	N/A

Eames, Charles; Saarinen, Eero	Organic	Vitra	1940	Armchair	N/A	142	N/A	N/A	N/A	N/A
Eiermann, Egon	No. SE18	Wilde & Spieth	1952	Folding chair	N/A	N/A	N/A	245	65	N/A
Ekselius, Jan	Jan	Stending	1970	Easy chair & Ottoman	N/A	N/A	N/A	468	N/A	N/A
Ellis, Harvey	Armchair	Gustav Stickley's C. W.	1903-04	Armchair	N/A	N/A	N/A	81	N/A	N/A
Ellis, Harvey	Chair	Gustav Stickley's C. W.	1903-04	Chair	N/A	N/A	N/A	80	N/A	N/A
Elmslie, George; Feick, George; Purcell, William	for: Merchants Bank of Winona	W. G. Purcell	1912-13	Easy chair	N/A	N/A	N/A	87	N/A	N/A
Esherick, Wharton	Pair of armchairs	Esherick, Wharton	1939	Armchair	N/A	N/A	N/A	184	N/A	N/A
Fabbri, Agenore	Nastro di Gala	Tecno	1991	Bench	N/A	N/A	N/A	570	N/A	N/A
Fabricius, Preben; Kastholm, Jørgen	Scimitar	Jacksons	1963	Easy chair	N/A	N/A	148	N/A	N/A	N/A
Ferrari-Hardoy, Jorge; Kurchan, Juan; Bonet, Antonio	Butterfly (Hardoy)	Stör Import-Export	1938	Easy chair	N/A	114	N/A	187	66	60
Fleetwood, Roy	Wing	Vitra	1988	Sofa	N/A	N/A	N/A	522	N/A	N/A
Fornasetti, Piero	Lyre	Fornasetti	1951	Artwork	N/A	N/A	N/A	306	N/A	N/A
Fornasetti, Piero	Sun	Fornasetti	1955	Artwork	N/A	N/A	N/A	306	N/A	N/A
Fornasetti, Piero	Moor	Fornasetti	1955	Artwork	N/A	N/A	N/A	308	N/A	N/A
Fornasetti, Piero	Cortinthian Capitello	Fornasetti	1955	Artwork	N/A	N/A	N/A	309	N/A	N/A
Frank, Jean-Michel	Chair	Ecart	1935	Chair	N/A	N/A	N/A	186	N/A	N/A
Frankl, Paul	Stool	Frankl, Paul	1925	Stool	N/A	N/A	N/A	126	N/A	N/A
Gaillard, Eugène	for: *L'Art Nouveau* Pavilion	Siegfried Bing	1900	Chair	N/A	N/A	N/A	43	N/A	N/A
Gallé, Émile	for: Maison Hannon	Gallé, Émile	1902	Chair	N/A	N/A	N/A	44	N/A	N/A
Gatti, Piero; Paolini, Cesare; Teodoro, Franco	Sacco	Zanotta	1968	Beanbag	68	126	N/A	411	67	106
Gaudí, Antonio	for: Casa Calvet	Gaudí, Antonio	1898-1900	Artwork	N/A	N/A	N/A	45	68	N/A
Gehry, Frank	Wiggle	Vitra	1972	Chair	80	52	N/A	456	69	N/A
Gehry, Frank	Easy Edges, Lounge Chair	Chiru	1971-72	Chair	N/A	N/A	174	N/A	N/A	113
Gehry, Frank	Easy Edges, Rocking Chair	Chiru	1972	Rocking chair	N/A	N/A	N/A	457	N/A	N/A
Gehry, Frank	Little Beaver	Vitra	1980	Easy chair & Ottoman	N/A	N/A	N/A	524	N/A	N/A
Gehry, Frank	Power Play	Knoll	1990-92	Easy chair & Ottoman	N/A	N/A	192	568	N/A	131
Ghyczy, Peter	Garden Egg	Reuter Products	1968	Easy chair	N/A	N/A	N/A	366	N/A	N/A
Gilardi, Piero	Massolo (Porfido)	Gufram	1974	Ottoman	N/A	N/A	N/A	430	N/A	N/A
Gili, Anna	Tonda	Cappellini	1991	Easy chair & Ottoman	N/A	N/A	N/A	601	N/A	N/A
Gimson, Ernest	Chair	Gimson & Barnsley	1895	Chair	N/A	N/A	N/A	36	N/A	N/A
Godwin, Edward	Chair	William Watt	1883	Chair	N/A	N/A	N/A	N/A	70	N/A
Goldman, Paul	Cherner	Plycraft	1957	Chair	N/A	N/A	N/A	N/A	N/A	81
Graffi, Carlo	Armchair	UNK	1950	Easy chair	N/A	N/A	N/A	302	N/A	N/A
Gragg, Samuel	Chair	Gragg, Samuel	1808	Chair	N/A	N/A	N/A	26	N/A	N/A
Gray, Eileen	Transat	Ecart	1925-26	Easy chair	24	N/A	24	144	71	49
Gray, Eileen	Non-Conformist	Aram Designs	1926	Easy chair	N/A	N/A	N/A	145	N/A	N/A
Gray, Eileen	Bibendum	Aram Designs	1929	Easy chair	N/A	N/A	32	145	N/A	N/A
Gray, Eileen	Roquebrune	Aram Designs	1932	Chair	N/A	N/A	N/A	146	N/A	N/A
Grcic, Konstantin	One	Magis	2003	Chair	106	N/A	N/A	N/A	N/A	N/A
Gregotti, Vittorio	Chaise longue	UNK	1953	Lounge chair	N/A	N/A	N/A	UNK*	N/A	N/A
Gropius, Walter	for: Faguswerk	Teta	1911	Sofa	N/A	N/A	N/A	92	N/A	N/A
Gropius, Walter	for: Faguswerk	Tecta	1911	Easy chair	N/A	N/A	N/A	93	N/A	N/A
Gropius, Walter	for: Bauhaus Weimar	Tecta	1923	Easy chair	N/A	N/A	N/A	100	N/A	N/A
Gruppo A.R.D.I.T.I.	Memoria	Cassina	1972	Easy chair	N/A	N/A	N/A	437	N/A	N/A
Gruppo DAM	Libro	Gruppo I. Busnelli	1970	Easy chair	N/A	N/A	N/A	432	N/A	N/A
Gruppo Strum	Pratone	Gufram	1966-70	Lounge chair	N/A	218	N/A	435	72	N/A
Guhl, Willy	Garden Chair	Eternit	1954	Garden chair	N/A	122	N/A	N/A	N/A	N/A

Guimard, Hector	for Maison Coillot	Guimard, Hector	1898-1900	Chair	N/A	N/A	N/A	39	N/A	N/A
Guimard, Hector	Chair	Guimard, Hector	1900	Chair	N/A	N/A	N/A	42	73	N/A
Hannah, Bruce; Morrison, Andrew	No. 2328	Knoll	1970	Office chair	N/A	N/A	N/A	447	N/A	N/A
Hartcourt, Geoffrey	Cleopatra, No. 248	Artifort	1973	Lounge chair	N/A	N/A	N/A	454	N/A	N/A
Held, Marc	Culbuto	Knoll	1967	Easy chair & Ottoman	N/A	N/A	N/A	329	N/A	N/A
Herbst, René	Armchair	E. Siegel et Stockman	1928	Easy chair	N/A	N/A	N/A	149	N/A	N/A
Herbst, René	Sandows	Formes Nouvelles	1928-29	Chair	N/A	106	N/A	150	74	N/A
Herbst, René	Fauteuil de repos	Formes Nouvelles	1928-29	Easy chair	N/A	N/A	N/A	151	75	N/A
Hilton, Matthew	Balzac	SCP	1991	Easy chair & Ottoman	N/A	N/A	196	N/A	N/A	N/A
Hironen	Unichair	Hironen	1993	Easy chair & Ottoman	N/A	N/A	N/A	575	N/A	N/A
Hoffmann, Josef	Armchair	Anton Pospischil	1899	Armchair	N/A	N/A	N/A	68	N/A	N/A
Hoffmann, Josef	No. 330	Jacob & Josef Kohn	1902	Chair	N/A	N/A	N/A	75	N/A	N/A
Hoffmann, Josef	for: Wittgenstein apartment	Wiener Werkstätte	1904	Armchair	N/A	N/A	N/A	74	N/A	N/A
Hoffmann, Josef	No. 728	Jacob & Josef Kohn	1905-06	Armchair	16	N/A	N/A	76	76	N/A
Hoffmann, Josef	Variation of the Cabaret Fledermaus chair	Thonet	1905-06	Chair	N/A	N/A	N/A	77	77	N/A
Hoffmann, Josef	No. 322	Jacob & Josef Kohn	1904	Chair	N/A	N/A	N/A	N/A	78	N/A
Hoffmann, Josef	No. 371	Jacob & Josef Kohn	1905-6	Chair	N/A	182	N/A	N/A	78	N/A
Hoffmann, Josef	Sitzmaschine	Jacob & Josef Kohn	1908	Easy chair	14	64	14	79	79	46
Hollein, Hans	Mitzi, No. D90	Poltronova	1981	Sofa	N/A	N/A	N/A	481	N/A	N/A
Homann, Alfred	Ensemble, No. B10	Fritz Hansen	1992	Stacking chair	N/A	N/A	N/A	557	N/A	N/A
Høvelskov, Jørgen	Harp	Christensen & Larsen	1968	Easy chair	N/A	N/A	N/A	249	N/A	N/A
Hvidt, Peter; Mølgaard-Nielsen, Orla	AX, No. 6020	Fritz Hansen	1950	Easy chair	N/A	N/A	78	243	N/A	N/A
Igarashi, Takenobu	Zao	Yamada Shomei Lighting	1992	Stool	N/A	N/A	N/A	574	N/A	N/A
Iribe, Paul	Armchair	Iribe, Paul	1913	Easy chair	N/A	N/A	N/A	88	N/A	N/A
Isozaki, Arata	Marilyn	Tendo	1972	Chair	N/A	N/A	N/A	442	N/A	N/A
Jacobs, Carl	Jason	Kandya	1950	Stacking chair	N/A	N/A	N/A	270	N/A	N/A
Jacobsen, Arne	Ant, No. 3100	Fritz Hansen	1951-52	Chair	N/A	120	92	283	80	N/A
Jacobsen, Arne	Series 7, No. 3107	Fritz Hansen	1955	Chair	52	N/A	110	284	81	74
Jacobsen, Arne	Series 7, No. 3217	Fritz Hansen	1955	Office chair	N/A	N/A	N/A	285	N/A	N/A
Jacobsen, Arne	Grand Prix, No. 4130	Fritz Hansen	1955	Chair	N/A	N/A	N/A	288	N/A	N/A
Jacobsen, Arne	Egg, No. 3316	Fritz Hansen	1957-58	Easy chair	N/A	N/A	122	286	82	84
Jacobsen, Arne	Swan, No. 3320	Fritz Hansen	1957-58	Easy chair	N/A	N/A	126	287	83	N/A
Jacobsen, Arne	Drop	Fritz Hansen	1958	Chair	N/A	N/A	136	N/A	N/A	N/A
Jacobsen, Arne	Oxford, No. 3291	Fritz Hansen	1965	Office chair	N/A	N/A	N/A	347	N/A	N/A
Jakobsen, Hans; Nielsen, Inger	Spring	Interiors Via European Design Team	1990	Easy chair	N/A	N/A	N/A	548	N/A	N/A
Jalk, Grete	Chair	Poul Jeppesen	1963	Easy chair	N/A	N/A	152	320	N/A	N/A
Jeanneret, Pierre; Le Corbusier; Perriand, Charlotte	Basculant, No. B301	Cassina	1928	Easy chair	N/A	70	N/A	130	94	N/A
Jeanneret, Pierre; Le Corbusier; Perriand, Charlotte	No. B306	Cassina	1928	Lounge chair	N/A	72	26	131	95	N/A
Jeanneret, Pierre; Le Corbusier; Perriand, Charlotte	Grand Confort No. LC2	Cassina	1928	Easy chair	N/A	N/A	30	133	93	N/A
Jeanneret, Pierre; Le Corbusier; Perriand, Charlotte	No. B302	Cassina	1928-29	Swivel chair	N/A	N/A	N/A	132	N/A	N/A
Jeckyll, Thomas	Chair	Bishop & Bernard	1876	Chair	N/A	N/A	N/A	35	N/A	N/A
Jones, Allen	Chair-Sculpture	Jones, Allen	1969	Artwork	N/A	N/A	N/A	416	N/A	N/A
Juhl, Finn	NV-44	Niels Roth Andersen	1944	Armchair	N/A	N/A	N/A	207	N/A	N/A
Juhl, Finn	Chieftain	Niels Roth Andersen	1949	Easy chair	N/A	N/A	70	208	84	N/A

Juhl, Finn	NV-45	Niels Roth Andersen	1945	Easy chair	N/A	N/A	58	209	85	N/A
Juhl, Finn	Pelican	Niels Vodder	1940	Easy chair	N/A	N/A	56	227	N/A	N/A
Katavolos, William; Kelley, Douglas; Littell, Ross	New York	ICF	1952	Sofa	N/A	N/A	N/A	252	N/A	N/A
Katavolos, William; Kelley, Douglas; Littell, Ross	T, No. 3LC	Cadsana	1952	Chair	N/A	N/A	N/A	253	N/A	72
Kawakami, Motomi	Fiorenza	Alberto Bazzani	1968	Lounge chair	N/A	N/A	N/A	363	N/A	N/A
Kinsman, Rodney	F Range	OMK Design	1966	Easy chair	N/A	N/A	N/A	407	N/A	N/A
Kinsman, Rodney	Omkstak	OMK Design	1971	Stacking chair	78	N/A	N/A	463	N/A	112
Kinsman, Rodney	Vienna	OMK Design	1984	Chair	N/A	N/A	N/A	507	N/A	N/A
Kinsman, Rodney	Seville	OMK Design	1991	Bench	N/A	N/A	N/A	556	N/A	N/A
Kita, Toshiyuki	Wink	Cassina	1976-80	Easy chair	N/A	194	176	496	86	N/A
Kjaerholm, Poul	No. PK25	Fritz Hansen	1951	Easy chair	N/A	N/A	N/A	238	N/A	N/A
Kjaerholm, Poul	No. PKo	Fritz Hansen	1952	Easy chair	N/A	N/A	N/A	239	N/A	N/A
Kjaerholm, Poul	No. PK22	Fritz Hansen	1955-56	Easy chair	N/A	N/A	114	281	N/A	78
Kjaerholm, Poul	No. PK31	Fritz Hansen	1958	Easy chair	N/A	N/A	132	N/A	N/A	N/A
Kjaerholm, Poul	No. PK9	Fritz Hansen	1960	Chair	N/A	N/A	142	N/A	N/A	N/A
Kjaerholm, Poul	No. PK20	Fritz Hansen	1967	Easy chair	N/A	N/A	N/A	342	N/A	N/A
Kjaerholm, Poul	Hammock, No. PK24	Fritz Hansen	1965	Lounge chair	N/A	94	164	343	N/A	N/A
Klint, Kaare	Faaborg	Rud Rasmussens Snedkerier	1914	Armchair	N/A	N/A	16	176	N/A	
Klint, Kaare	Redchair	Rud Rasmussens Snedkerier	1927	Chair & Armchair	N/A	N/A	N/A	176	N/A	N/A
Klint, Kaare	Safari	Rud Rasmussens Snedkerier	1933	Easy chair	N/A	N/A	N/A	181	88	N/A
Klint, Kaare	Deck	Rud Rasmussens Snedkerier	1933	Lounge chair	N/A	N/A	N/A	180	87	N/A
Knorr, Donald	No. 132U	Knoll	1949	Chair	N/A	N/A	N/A	222	N/A	N/A
Koch, Mogens	MK	Rud Rasmussens Snedkerier	1932	Folding chair	N/A	N/A	N/A	182	N/A	N/A
Komai, Ray	No. 939	J. G. Furniture Systems	1949	Chair	N/A	N/A	N/A	223	N/A	N/A
Kramer, Friso	Chair	De Cirkel	1954	Chair	N/A	N/A	N/A	244	N/A	N/A
Kukkapuro, Yrjö	Karuselli	Avarte	1964-65	Easy chair & Ottoman	N/A	N/A	156	359	89	N/A
Kukkapuro, Yrjö	Fysio	Avarte	1978	Office chair	N/A	N/A	N/A	449	N/A	N/A
Kuramata, Shiro	Sing Sing Sing	Xo	1985	Armchair	N/A	N/A	N/A	512	N/A	N/A
Kuramata, Shiro	How High the Moon	Vitra	1986	Easy chair	88	200	186	513	90	122
Kuramata, Shiro	Indian Rhapsody	Tosh Sash Co.	1989	Bar stool	N/A	N/A	N/A	532	N/A	N/A
Kuramata, Shiro	Miss Blanche	Kokuyo	1989	Easy chair	N/A	204	N/A	533	91	128
Landels, Willie	Throw-away	Zanotta	1965	Sofa	N/A	N/A	N/A	406	N/A	N/A
Lane, Danny	Etruscan	Lane, Danny	1984	Artwork	N/A	N/A	N/A	527	N/A	121
Lange, Gerd	Flex 2000	Thonet	1973-74	Stacking chair	N/A	N/A	N/A	474	N/A	N/A
Laverne, Erwine; Laverne, Estelle	Champagne	Laverne	1957	Armchair	N/A	N/A	N/A	250	92	N/A
Laverne, Erwine; Laverne, Estelle	Daffodil & Jonquil	Laverne	1957	Easy chair	N/A	N/A	N/A	250	N/A	83
Laverne, Erwine; Laverne, Estelle	Lotus	Laverne	1958	Chair	N/A	N/A	N/A	251	N/A	N/A
Laverne, Erwine; Laverne, Estelle	Tulip	Laverne	1960	Easy chair	N/A	N/A	N/A	381	N/A	N/A
Lazzeroni, Roberto	Cigarra	Ceccotti	1988	Armchair	N/A	N/A	N/A	545	N/A	N/A
Lazzeroni, Roberto	Star Trek	Ceccotti	1994	Easy chair & Ottoman	N/A	N/A	N/A	581	N/A	N/A
Legrain, Pierre-Émile	Armchair	Legrain, Pierre-Émile	1925	Easy chair	N/A	N/A	N/A	125	N/A	N/A
Legrain, Pierre-Émile	Chaise longue	Legrain, Pierre-Émile	1928	Lounge chair	N/A	N/A	N/A	124	N/A	N/A
Leleu, Jules-Émile; Leleu, André	Stool	Leleu, Jules-Émile	1925	Stool	N/A	N/A	N/A	127	N/A	N/A
Leonardi, Cesare; Stagi, Franca	Ribbon, No. CL9	Bernini	1961	Easy chair	N/A	N/A	N/A	377	N/A	90
Leonardi, Cesare; Stagi, Franca	Dondolo	Elco	1967	Rocking chair	N/A	N/A	N/A	376	N/A	N/A

Lissitzky, El	No. D61	Tecta	1930	Armchair	N/A	N/A	N/A	134	N/A	N/A
Lissitzky, El	No. D62	Tecta	1928	Easy chair	N/A	N/A	N/A	135	N/A	N/A
Lissoni, Piero	Aprile	Cappellini	1996	Armchair	N/A	N/A	N/A	553	N/A	N/A
Lloyd Loom Studio	No. U64	W. Lusty & Sons	1945	Easy chair	N/A	N/A	N/A	202	N/A	N/A
Lomazzi, Paolo	Onda	Zanotta	1985	Sofa	N/A	N/A	N/A	UNK*	N/A	N/A
Loos, Adolf	for: Café Museum	Jacob & Josef Kohn	1898	Chair	N/A	N/A	N/A	66	N/A	40
Loos, Adolf	Armchair	J. Bohn	1899	Armchair	N/A	N/A	N/A	69	N/A	N/A
Lorenz, Anton	Armchair	Tecta	1932	Easy chair	N/A	N/A	N/A	119	N/A	N/A
Lovegrove, Ross	M	Mordoso	1994	Sofa	N/A	N/A	N/A	582	N/A	N/A
Lovegrove, Ross	Crop	Fasem	1996	Chair & Armchair	N/A	N/A	N/A	608	96	N/A
Lovegrove, Ross	Bone	Ceccotti	1996	Artwork	N/A	N/A	N/A	609	97	N/A
Lovegrove, Ross	Magic	Fasem	1997	Chair	N/A	N/A	N/A	610	N/A	N/A
Lovegrove, Ross	FO8	Cappellini	1992	Chair	N/A	N/A	N/A	611	N/A	N/A
Luchi, Roberto; Orlandini, Paolo	SoHo	Knoll	1994	Office chair	N/A	N/A	N/A	550	N/A	N/A
Luckhardt, Hans; Luckhardt, Wassili	No. ST14	Thonet	1929	Chair	N/A	108	N/A	121	N/A	N/A
Luckhardt, Hans; Luckhardt, Wassili	Siesta Medizinal	Thonet	1936	Easy chair	N/A	80	N/A	N/A	N/A	N/A
Mackintosh, Charles	for: Argyle Street Tea Rooms	Cassina	1897	Chair	N/A	N/A	N/A	N/A	98	39
Mackintosh, Charles	for: Argyle Street Tea Rooms	UNK	1897	Armchair	N/A	N/A	N/A	N/A	99	N/A
Mackintosh, Charles	for: Miss Cranston's Tea Rooms	Freud	1900	Chair	10	N/A	10	N/A	N/A	N/A
Mackintosh, Charles	for: Rose Boudoir	UNK	1902	Chair	N/A	N/A	N/A	63	N/A	N/A
Mackintosh, Charles	Lug chair for Hous'hill	Francis Smith	1904	Easy chair	N/A	N/A	N/A	64	N/A	N/A
Mackintosh, Charles	Hill House chair	Alex Martin	1904	Chair	N/A	N/A	N/A	65	N/A	N/A
Mackintosh, Charles	for: 78 Derngate, Northamp-ton	UNK	1919	Chair	N/A	N/A	N/A	91	N/A	N/A
Mackintosh, Charles	Oak armchair	UNK	c. 1903	Easy chair	N/A	N/A	N/A	N/A	N/A	43
Magistretti, Vico	Selene	Heller	1969	Stacking chair	N/A	N/A	N/A	384	100	109
Magistretti, Vico	Gaudí	Artemide	1970	Armchair	N/A	N/A	N/A	426	N/A	N/A
Magistretti, Vico	Golem	Carlo Poggi	1970	Chair	N/A	N/A	N/A	443	N/A	N/A
Magistretti, Vico	Sindbad	Cassina	1981	Sofa	N/A	N/A	N/A	498	N/A	N/A
Magistretti, Vico	Veranda	Cassina	1983	Sofa	N/A	N/A	N/A	497	N/A	N/A
Magistretti, Vico	Silver	De Padova	1989	Office chair	N/A	N/A	N/A	519	N/A	N/A
Majorelle, Louis	Chair	Majorelle, Louis	1900	Artwork	N/A	N/A	N/A	41	N/A	N/A
Makepeace, John	Ebony Gothic/Mitre	Makepeace, John	1978	Armchair	N/A	N/A	N/A	466	N/A	N/A
Mallet-Stevens, Rob-ert	Pair of Armchairs	UNK	1929-30	Armchair	N/A	N/A	N/A	122	N/A	N/A
Mallet-Stevens, Rob-ert	Chair	Ecart	1928	Chair	N/A	N/A	N/A	123	N/A	N/A
Maran, Marco	Sinué	Fasem	1995	Armchair	N/A	N/A	N/A	599	N/A	N/A
Mari, Enzo	Sof Sof	Driade	1971	Chair	N/A	N/A	N/A	441	N/A	N/A
Mari, Enzo	Box	Driade	1975-76	Chair	N/A	N/A	N/A	462	N/A	N/A
Martin, Etienne-Henri	Chauffeuse 1500	C. S. T. N. Mangau	1970-71	Easy chair	N/A	N/A	N/A	469	N/A	N/A
Matégot, Mathieu	Nagasaki	UNK	1951	Chair	N/A	N/A	N/A	316	N/A	N/A
Mathsson, Bruno	Grasshopper	Karl Mathsson	1931	Easy chair	N/A	N/A	40	N/A	N/A	N/A
Mathsson, Bruno	Pernilla	Karl Mathsson	1934	Lounge chair	N/A	N/A	N/A	172	101	N/A
Mathsson, Bruno	Eva	Dux	1934	Easy chair	N/A	N/A	52	173	102	57
Matta, Roberto	Malitte	Knoll	1966	Seating system	N/A	N/A	N/A	396	N/A	99
Matta, Roberto	MAgriTTA	Gavina	1970	Artwork	N/A	N/A	N/A	420	N/A	N/A
Matta, Roberto	Margarita	Gavina	1970	Artwork	N/A	N/A	N/A	421	N/A	N/A
Mazza, Sergio	Toga	Artemide	1968	Easy chair	N/A	N/A	N/A	370	N/A	N/A
McArthur, Warren	Ambassador	Classicon	1932	Easy chair & Ottoman	N/A	N/A	N/A	147	N/A	N/A
Meda, Alberto	Light Light	Alias	1987	Chair	N/A	54	N/A	N/A	N/A	N/A
Meda, Alberto	Armframe	Alias	1996	Easy chair	N/A	N/A	N/A	607	N/A	N/A

Meda, Luca	Risiedo	Molteni & C.	1990-91	Chair	N/A	N/A	N/A	579	N/A	N/A
Mendini, Alessandro	Lassù	Vitra	1974	Artwork	N/A	224	N/A	N/A	N/A	N/A
Mendini, Alessandro	Redesigned Wassily	Studio Alchimia	1978	Easy chair	N/A	N/A	N/A	477	N/A	N/A
Mendini, Alessandro	Proust	Cappellini	1978	Easy chair	N/A	192	N/A	478	103	115
Mendini, Alessandro	Kandissi	Studio Alchimia	1978	Sofa	N/A	N/A	N/A	479	N/A	N/A
Mendini, Alessandro	Redesigned Thonet	Studio Alchimia	1979	Artwork	N/A	N/A	N/A	476	N/A	N/A
Mendini, Alessandro	Zabro	Zanotta	1984	Artwork	N/A	N/A	N/A	491	N/A	N/A
Mies van der Rohe	No. MR20	Thonet & Knoll	1927	Armchair	N/A	N/A	N/A	112	104	51
Mies van der Rohe	No. MR10	Thonet & Knoll	1927	Chair	N/A	104	N/A	113	105	N/A
Mies van der Rohe	Barcelona, No. MR90	Knoll	1929	Easy chair	28	214	34	114	106	55
Mies van der Rohe	Brno, No. MR50	Knoll	1929-30	Chair	N/A	N/A	36	115	N/A	N/A
Mies van der Rohe	Tugendhat, No. MR70	Knoll	1929-30	Easy chair	N/A	N/A	N/A	117	N/A	N/A
Mies van der Rohe	Chaise longue	Knoll	1931	Lounge chair	N/A	N/A	N/A	116	N/A	N/A
Milne, Andrew	Armchair	Mines & West UK	1947	Armchair	N/A	N/A	N/A	206	N/A	N/A
Mo, Carlo	Chip	Tecno	1991	Artwork	N/A	N/A	N/A	571	N/A	N/A
Mogensen, Børge	No. 1789	Fritz Hansen	1945	Sofa	N/A	N/A	N/A	215	N/A	N/A
Mogensen, Børge	Hunting chair	Fredericia Furniture	1950	Easy chair	N/A	N/A	80	N/A	N/A	N/A
Mogensen, Børge	Spanish chair, No. 2226	Fredericia Furniture	1959	Easy chair	N/A	N/A	138	282	N/A	N/A
Mollino, Carlo	for: Lisa & Gio Ponti	Apelli & Varesio	1940	Chair	N/A	N/A	N/A	225	N/A	62
Mollino, Carlo	for: Minola House	Apelli & Varesio	1944	Easy chair	N/A	N/A	N/A	224	N/A	63
Mollino, Carlo	for: Lattes Publishing House	Apelli & Varesio	1951	Chair	N/A	N/A	N/A	301	N/A	N/A
Mollino, Carlo	Armchair	Apelli & Varesio	1952	Easy chair	N/A	N/A	N/A	299	107	N/A
Mollino, Carlo	for: Casa Cattaneo, Agra	Apelli & Varesio	1953	Chair	N/A	158	N/A	299	N/A	N/A
Mollino, Carlo	for: Restaurant Pavia	Ettore Canali	1954	Chair	N/A	N/A	N/A	298	N/A	N/A
Mollino, Carlo; Morbelli, Aldo	for: RAI Auditorium	UNK	1951	Easy chair	N/A	N/A	N/A	300	N/A	N/A
Morita, Masaki	Blue sofa	UNK	1989	Sofa	N/A	N/A	N/A	N/A	N/A	129
Morrison, Jasper	Thinking Man's Chair	Cappellini	1987	Easy chair	N/A	N/A	188	534	108	123
Morrison, Jasper	Ply	Vitra	1988	Chair	90	132	N/A	N/A	N/A	N/A
Morrison, Jasper	Sofa	Vitra	1989-91	Sofa	N/A	N/A	N/A	563	N/A	N/A
Morrison, Jasper	Three	Cappellini	1992	Sofa	N/A	N/A	N/A	562	N/A	N/A
Morrison, Jasper	Air	Magis	1999	Chair	100	N/A	N/A	N/A	N/A	N/A
Morrison, Jasper	Low Pad	Cappellini	1999	Easy chair	N/A	N/A	200	N/A	N/A	
Moser, Koloman	Armchair, No. 719/F	Jacob & Josef Kohn	1901	Armchair	N/A	N/A	N/A	78	N/A	N/A
Moser, Koloman	for: Sanatorium Purkersdorf	Wittmann	1902	Easy chair	12	N/A	N/A	72	109	42
Motte, Joseph-André	Tripode	Rougier	1949	Easy chair	N/A	N/A	N/A	203	N/A	N/A
Mourgue, Olivier	Djinn chair	Airborne	1965	Easy chair	N/A	N/A	N/A	391	111	95
Mourgue, Olivier	Djinn chaise longue	Airborne	1965	Lounge chair	N/A	N/A	154	390	110	N/A
Mourgue, Olivier	Bouloum	Arconas	1968	Lounge chair	N/A	N/A	N/A	392	N/A	N/A
Mourgue, Pascal	Rio	Artelano	1991	Stacking chair	N/A	N/A	N/A	598	N/A	N/A
Mucchi, Gabriele	Genni	Zanotta	1935	Lounge chair	N/A	N/A	N/A	152	112	N/A
Murdoch, Peter	Spotty	International Paper	1963	Child's chair	N/A	N/A	N/A	405	113	91
Nakashima, George	Conoid	Nakashima, George	1961	Bench	N/A	N/A	N/A	322	N/A	N/A
Nelson, George	Coconut	Vitra	1955	Lounge chair	N/A	88	108	264	114	79
Nelson, George	Modular	Herman Miller	1956	Seating system	N/A	N/A	N/A	262	N/A	N/A
Nelson, George	Kangaroo, No. 5672	Herman Miller	1956	Easy chair	N/A	N/A	N/A	263	N/A	N/A
Nelson, George	Marshmallow	Herman Miller	1956	Sofa	N/A	188	N/A	265	115	N/A
Nelson, George	Pretzel	ICF	1957	Armchair	N/A	N/A	N/A	257	N/A	N/A
Nelson, George	DAF	Herman Miller	1956-1958	Armchair	N/A	N/A	130	260	N/A	N/A
Nelson, George	MAA	Herman Miller	1958	Armchair	N/A	N/A	N/A	261	N/A	85
Nelson, George	Sling Sofa	Herman Miller	1964	Sofa	N/A	N/A	N/A	334	N/A	N/A
Nelson, George	Perch, No. 64940	Herman Miller	1964	Drawing stool	N/A	N/A	N/A	339	N/A	N/A
Newson, Marc	Lockheed Lounge	Idée	1985-86	Lounge chair	N/A	172	184	537	117	N/A

Newson, Marc	Wooden Chair	Cappellini	1992	Easy chair	N/A	N/A	N/A	569	N/A	N/A
Newson, Marc	Felt	Cappellini	1994	Easy chair	N/A	N/A	N/A	536	116	N/A
Nicholson, Kit	Standard	UNK	1935	Chair	N/A	N/A	N/A	159	N/A	N/A
Noguchi, Isamu	No. IN70 & No. IN71	Herman Miller	1946	Sofa & Ottoman	N/A	N/A	N/A	231	118	N/A
Noguchi, Isamu	No. IN22	Herman Miller	1949	Stool	N/A	N/A	N/A	230	N/A	N/A
Noguchi, Isamu	Rocking stool	Knoll	1954	Stool	50	N/A	N/A	269	119	N/A
Olbrich, Joseph	for: Villa Friedmann	UNK	1898-99	Armchair	N/A	N/A	N/A	55	N/A	N/A
Olbrich, Joseph	for: 1900 Paris Exhibition	Hofmöbelfabrik	1900	Armchair	N/A	N/A	N/A	54	N/A	N/A
Pankok, Bernhard	for: a ladies' room	Vereinigte Werkstätten	1900-01	Armchair	N/A	N/A	N/A	52	N/A	N/A
Panton, Verner	Cone	Polythema	1958	Chair	N/A	N/A	N/A	313	120	87
Panton, Verner	Panton	Vitra	1959-60	Stacking chair	70	164	166	365	121	89
Panton, Verner	Wire Cone	Fritz Hansen	1960	Chair	N/A	N/A	134	315	N/A	N/A
Panton, Verner	Upholstered seating system	Storz + Palmer	1963	Seating system	N/A	N/A	N/A	398	N/A	N/A
Panton, Verner	S	Thonet	1966	Chair	N/A	N/A	N/A	380	N/A	N/A
Panton, Verner	Pantower	UNK	1968-69	Seating system	N/A	220	N/A	394	122	N/A
Panton, Verner	System 1-2-3	Fritz Hansen	1973	Seating system	N/A	N/A	N/A	472	N/A	N/A
Panton, Verner	Sitting Wheel	Panton, Verner	1974	Seating system	N/A	N/A	N/A	434	N/A	N/A
Panton, Verner	Sisters Emmenthaler	Cassina	1979	Sofa	N/A	N/A	N/A	470	N/A	N/A
Pareschi, Gianni	Novia	Ciatti	1996	Stacking chair	N/A	N/A	N/A	597	N/A	N/A
Paul, Bruno	Armchair	Vereinigte Werkstätten	1901	Easy chair	N/A	N/A	N/A	53	N/A	N/A
Paulin, Pierre	Mushroom, No. 560	Artifort	1963	Easy chair	N/A	N/A	N/A	387	N/A	N/A
Paulin, Pierre	No. 545	Artifort	1963	Easy chair	N/A	N/A	N/A	388	N/A	N/A
Paulin, Pierre	Ribbon, No. 582	Artifort	1966	Easy chair	N/A	N/A	160	389	N/A	N/A
Paulin, Pierre	Tongue, No. 577	Artifort	1967	Lounge chair	N/A	168	N/A	386	124	101
Paulin, Pierre	ABCD	Artifort	1968	Sofa	N/A	N/A	N/A	385	N/A	N/A
Paulin, Pierre	ABCD	Artifort	1968	Easy chair	N/A	N/A	N/A	385	N/A	N/A
Paulin, Pierre	Groovy, No. F598	Artifort	1973	Easy chair	N/A	N/A	N/A	455	N/A	N/A
Paulin, Pierre	Dangari	Sauvagnat Allibert Groupe	1978	Garden chair	N/A	N/A	N/A	465	N/A	N/A
Pensi, Jorge	Toledo	Amat	1986-88	Chair	N/A	202	N/A	517	125	125
Peregalli, Maurizio	Glasnost	Noto-Zeus	1988	Armchair	N/A	N/A	N/A	516	N/A	N/A
Perriand, Charlotte	Synthese des Arts	Galerie Steph Simon	1953	Stacking chair	N/A	N/A	N/A	317	N/A	N/A
Pesce, Gaetano	Donna, Up 5 & Up 6	B & B Italia	1969	Easy chair & Ottoman	72	50	N/A	400	126	107
Pesce, Gaetano	Up Series	B & B Italia	1969	Seating system	N/A	N/A	N/A	401	127	N/A
Pesce, Gaetano	Sit Down	Cassina	1975-76	Easy chair	N/A	N/A	N/A	436	N/A	N/A
Pesce, Gaetano	Dalila	Cassina	1980	Easy chair	N/A	N/A	N/A	501	N/A	N/A
Pesce, Gaetano	Pratt	Pesce, Gaetano	1983	Artwork	N/A	N/A	N/A	500	N/A	N/A
Pesce, Gaetano	I Feltri	Cassina	1987	Easy chair	N/A	N/A	N/A	499	N/A	N/A
Pesce, Gaetano	543 Broadway	Bernini	1993	Chair	N/A	N/A	N/A	591	N/A	N/A
Pesce, Gaetano	Umbrella	Zerodisegno	1992-95	Folding chair	N/A	N/A	N/A	590	N/A	N/A
Pichler, Walter	Galaxy 1	Svoboda & Co.	1966	Easy chair	N/A	N/A	N/A	358	N/A	N/A
Pieck, Han	Armchair	Lawo	1946-47	Easy chair	N/A	N/A	N/A	221	N/A	N/A
Pillet, Christophe	Agatha Dreams	Ceccotti	1995	Lounge chair	N/A	N/A	N/A	592	N/A	N/A
Pillet, Christophe	Y's	Cappellini	1995	Swivel chair	N/A	N/A	N/A	593	N/A	N/A
Piretti, Giancarlo	Plia	Castelli	1969	Folding chair	N/A	128	N/A	383	128	108
Platner, Warren	No. 1725 A	Knoll	1966	Easy chair	N/A	N/A	N/A	340	129	97
Pollock, Charles	No. 12E1	Knoll	1965	Office chair	N/A	N/A	N/A	335	N/A	N/A
Pollock, Charles	Penelope	Castelli	1982	Chair	N/A	N/A	N/A	518	N/A	N/A
Ponti, Gio	Superleggera	Cassina	1951-57	Chair	60	124	118	289	130	76
Power, Tim	Chip	Zeritalia	1993-95	Stacking chair	N/A	N/A	N/A	594	N/A	N/A
Pratt, Davis	Airchair	Pratt, Davis	1948	Easy chair	N/A	N/A	N/A	232	N/A	N/A
Prina, Nani	Sess Longue	Sormani	1968	Sofa	N/A	N/A	N/A	397	N/A	N/A
Prouvé, Jean	Fauteuil métallique (Cité)	Tecta	1927	Easy chair	N/A	N/A	38	141	N/A	

Prouvé, Jean	Chaise Inclinable	Tecta	1924-30	Folding chair	N/A	78	N/A	140	N/A	N/A
Prouvé, Jean	Grand Repos	Tecta	1928-30	Easy chair	N/A	76	N/A	141	N/A	N/A
Prouvé, Jean	Standard	Tecta	1930	Stacking chair	N/A	N/A	N/A	142	131	N/A
Prouvé, Jean	Visteur	Les Ateliers Jean Prouvé	1942	Easy chair	N/A	N/A	N/A	198	N/A	N/A
Prouvé, Jean	Chair	Les Ateliers Jean Prouvé	1945	Chair	N/A	N/A	N/A	199	N/A	N/A
Prouvé, Jean	Antony	Les Ateliers Jean Prouvé	1950	Easy chair	N/A	N/A	104	242	N/A	69
Prouvé, Jean; André, Jacques	Garden chair	Les Ateliers Jean Prouvé	1936	Easy chair	N/A	32	N/A	N/A	N/A	N/A
Pugin, Edward	Chair	UNK	1858	Chair	N/A	N/A	N/A	UNK*	N/A	N/A
Raacke, Peter	Papp	Papp-Faltmöbel E. Raacke	1967	Easy chair	N/A	N/A	N/A	404	N/A	103
Race, Ernest	BA	Race Furniture	1945	Chair & Armchair	N/A	N/A	N/A	204	N/A	N/A
Race, Ernest	Antelope, Chair	Race Furniture	1950	Chair	44	N/A	88	272	132	68
Race, Ernest	Antelope, Bench	Race Furniture	1950	Bench	N/A	N/A	N/A	273	N/A	N/A
Race, Ernest	Neptune	Race, Ernest	1953	Lounge chair	N/A	N/A	N/A	237	N/A	N/A
Rams, Dieter	No. RZ 62	Vitose & Zapf	1962	Easy chair	N/A	N/A	N/A	346	N/A	N/A
Rash, Heinz & Bodo	Sitzgeiststuhl	Rash, Heinz & Bodo	1924	Chair	N/A	N/A	N/A	107	N/A	N/A
Rasulo, Prospero	Calea	Arflex	1996	Stacking chair	N/A	N/A	N/A	596	N/A	N/A
Riemerschmid, Richard	Chair	Handwerkskunst	1905	Chair	N/A	N/A	N/A	60	N/A	N/A
Riemerschmid, Richard	Armchair	Handwerkskunst	1905	Armchair	N/A	N/A	N/A	61	N/A	N/A
Riemerschmid, Richard	Chair for a music room	Handwerkskunst	1898-99	Chair	N/A	N/A	N/A	N/A	133	41
Rietveld, Gerrit	Kinderstoel	Rietveld, Gerrit	1915-19	Child's highchair	N/A	N/A	N/A	96	N/A	N/A
Rietveld, Gerrit	Hogestoel	Rietveld, Gerrit	1919	Easy chair	N/A	N/A	N/A	97	N/A	N/A
Rietveld, Gerrit	Red/Blue	Cassina	1918-23	Easy chair	18	210	18	95	135	47
Rietveld, Gerrit	Berlin chair	G. A. van de Groenekan	1923	Chair	N/A	N/A	N/A	98	N/A	N/A
Rietveld, Gerrit	Chair	G. A. van de Groenekan	1925	Chair	N/A	N/A	N/A	136	N/A	N/A
Rietveld, Gerrit	Beugelstoel	Metz & Co.	1927	Chair	N/A	N/A	N/A	136	N/A	N/A
Rietveld, Gerrit	Beugelstoel 2	Metz & Co.	1927	Easy chair	N/A	N/A	N/A	137	N/A	N/A
Rietveld, Gerrit	Zig-Zag	Cassina	1932-34	Chair	34	112	50	157	136	58
Rietveld, Gerrit	Crate	Cassina	1934	Easy chair	N/A	N/A	N/A	158	N/A	N/A
Rietveld, Gerrit	Zig-Zag, Armchair	Metz & Co.	1942	Armchair	N/A	N/A	N/A	156	N/A	N/A
Rietveld, Gerrit	Aluminium chair	G. A. van de Groenekan	1942	Easy chair	N/A	82	N/A	193	137	N/A
Rietveld, Gerrit	Steltman	G. A. van de Groenekan	1963	Chair	N/A	N/A	N/A	323	N/A	N/A
Risom, Jens	No. 666 WSP	Knoll	1942	Chair	N/A	N/A	N/A	200	N/A	N/A
Rizzatto, Paolo	Young Lord & Lady	Alias	1996	Office chair	N/A	N/A	N/A	606	N/A	N/A
Robsjohn-Gibbings, Terence	Armchair	Widdicomb Furniture Co.	1950	Easy chair	N/A	N/A	N/A	235	N/A	N/A
Rosselli, Alberto	Jumbo	Saporiti	1969	Easy chair	N/A	N/A	N/A	371	N/A	N/A
Rossetti, Dante	Rossetti	Morris & Co.	1864-65	Armchair	N/A	N/A	N/A	32	N/A	N/A
Rossi, Aldo	Parigi	Unifor	1989	Easy chair	N/A	N/A	N/A	540	N/A	N/A
Rowland, David	No. GF40/4	General Fireproofing Co.	1964	Stacking chair	N/A	N/A	N/A	325	N/A	N/A
Rowland, David	No. GF40/4	General Fireproofing Co.	1964	Chair with tablet	N/A	N/A	N/A	324	N/A	N/A
Ruhlmann, Jacques-Émile	Défenses chair	Ruhlmann et Laurent	1920	Easy chair	N/A	N/A	N/A	89	N/A	N/A
Ruhlmann, Jacques-Émile	Palette	Ruhlmann et Laurent	1925	Chair	N/A	N/A	N/A	129	N/A	N/A
Ruhlmann, Jacques-Émile	Maharaja	Ruhlmann et Laurent	1929	Swivel chair	N/A	N/A	N/A	128	N/A	N/A
Russell, Gordon	Armchair	Russell, Gordon	1929	Easy chair	N/A	N/A	N/A	178	N/A	N/A
Saarinen, Eero	Grasshopper	Knoll	1946-47	Easy chair	N/A	N/A	N/A	228	N/A	N/A
Saarinen, Eero	Womb	Knoll	1947-48	Easy chair & Ottoman	N/A	38	62	229	138	65
Saarinen, Eero	No. 71 Series	Knoll	1951	Office chair	N/A	N/A	N/A	260	N/A	N/A
Saarinen, Eero	Tulip, No. 150	Knoll	1955-56	Armchair	54	N/A	N/A	259	139	75
Saarinen, Eero	Tulip, No. 151	Knoll	1955-56	Chair	54	162	112	259	139	N/A
Saarinen, Eliel	for: Saarinen House	Adelta	1929	Chair	N/A	N/A	N/A	177	N/A	N/A

Sachs, Rolf	Original	Sachs, Rolf	1993	Chair	N/A	N/A	N/A	587	N/A	N/A
Sachs, Rolf	DJ Evolution	Tagliabue	1995	Armchair	N/A	N/A	N/A	586	N/A	N/A
Santachiara, Denis	Mama	Baleri	1995	Rocking chair & Ottoman	N/A	N/A	N/A	584	N/A	N/A
Sapper, Richard	Sapper Collection	Knoll	1978-79	Office chair	N/A	N/A	N/A	450	N/A	N/A
Sapper, Richard; Zanuso, Marco	Lambda	Gavina	1959-64	Chair	N/A	44	N/A	N/A	N/A	N/A
Sapper, Richard; Zanuso, Marco	No. 4999/5	Kartell	1961-64	Child's chair	N/A	N/A	N/A	362	161	N/A
Sawaya, William	Patty Difusa	Sawaya & Moroni	1993	Easy chair	N/A	N/A	N/A	577	N/A	N/A
Scarpa, Afra & Tobia	No. 925	Cassina	1965	Easy chair	N/A	N/A	N/A	349	N/A	N/A
Scarpa, Carlo	No. 765	Bernini	1934	Chair	N/A	N/A	N/A	183	N/A	N/A
Scarpa, Carlo	Kentucky, No. 783	Bernini	1977	Chair	N/A	N/A	N/A	460	N/A	N/A
Scarpa, Tobia	Bonanza	B & B Italia	1969	Easy chair	N/A	N/A	N/A	348	N/A	N/A
Schinkel, Karl	Armchair	Tecta	1820-25	Garden chair	N/A	22	N/A	27	140	N/A
Schreiner, Frank (Stiletto)	Consumer's Rest	Brüder Siegel Leipheim	1983	Artwork	N/A	228	N/A	503	N/A	120
Schultz, Richard	Leisure Collection	Knoll	1966	Lounge chair	N/A	N/A	N/A	344	N/A	N/A
Scott, Fred	Supporto	Hille	1979	Office chair	82	N/A	N/A	451	N/A	N/A
Serafini, Luigi	Santa	Sawaya & Moroni	1990	Artwork	N/A	N/A	N/A	559	N/A	N/A
Sípek, Borek	Bambi	Néotù	1988	Artwork	N/A	N/A	N/A	530	N/A	N/A
Sípek, Borek	Sedlak	Vitra	1992	Artwork	N/A	N/A	N/A	UNK*	N/A	132
Smithson, Alison & Smithson, Peter	Trundling Turk, No. NF 3400	Tecta	1954	Easy chair	N/A	N/A	N/A	247	N/A	N/A
Sottsass, Ettore	Synthesis 45	Olivetti	1970-71	Office chair	76	N/A	N/A	452	N/A	N/A
Sottsass, Ettore	Seggiolina	Studio Alchimia	1980	Artwork	N/A	N/A	N/A	480	N/A	N/A
Sottsass, Ettore	Westside Collection	Knoll	1983	Easy chair	N/A	N/A	N/A	493	N/A	N/A
Sottsass, Ettore	Teodora	Vitra	1986-87	Artwork	N/A	N/A	N/A	486	N/A	N/A
Stam, Mart	No. S33	Thonet	1926	Chair	22	N/A	22	106	141	50
Starck, Philippe	Richard III	Baleri	1981	Easy chair	N/A	N/A	N/A	539	N/A	N/A
Starck, Philippe	Costes	Driade	1982	Easy chair	N/A	N/A	N/A	508	142	118
Starck, Philippe	Sarapis	Driade	1985	Bar stool	N/A	N/A	N/A	514	N/A	N/A
Starck, Philippe	Ed Archer	Driade	1986	Chair	N/A	N/A	N/A	509	N/A	N/A
Starck, Philippe	Lola Mundo	Driade	1986	Chair	N/A	N/A	N/A	538	N/A	N/A
Starck, Philippe	Dr. Glob	Kartell	1988	Stacking chair	N/A	N/A	N/A	515	143	N/A
Starck, Philippe	W. W. Stool	Vitra	1990	Stool	N/A	174	N/A	567	N/A	N/A
Starck, Philippe	Boom Rang	Driade	1992	Chair	N/A	N/A	N/A	566	N/A	N/A
Starck, Philippe	Louis 20	Vitra	1992	Chair & Armchair	94	56	194	N/A	N/A	133
Starck, Philippe	Lord Yo	Driade	1994	Easy chair	N/A	N/A	N/A	604	144	N/A
Starck, Philippe	Miss Trip	Kartell	1996	Chair	N/A	N/A	N/A	605	145	N/A
Starck, Philippe	Dr. No	Kartell	1996	Stacking chair	N/A	N/A	N/A	605	N/A	N/A
Stoppino, Giotto	Alessia	Driade	1970	Chair	N/A	N/A	N/A	425	N/A	N/A
Studio 65	Capitello	Gufram	1971	Artwork	N/A	N/A	N/A	431	N/A	N/A
Studio 65	Marilyn	Gufram	1972	Sofa	N/A	N/A	N/A	433	N/A	N/A
Studio Architetti Associati	Chaise longue	Sim	1953	Lounge chair	N/A	N/A	N/A	303	N/A	N/A
Studio Simon	Omaggio ad Andy Warhol	Gavina	1973	Stool	N/A	N/A	N/A	417	N/A	N/A
Summers, Gerald	Armchair	Makers of Simple Furniture	1933-34	Easy chair	N/A	110	48	174	N/A	N/A
Summers, Gerald	Pair of side chairs	Makers of Simple Furniture	1938	Chair	N/A	N/A	N/A	175	N/A	N/A
Székely, Martin	Pi	Néotù	1984	Lounge chair	N/A	N/A	N/A	523	N/A	N/A
Takahama, Kazuhide	Suzanne	Gavina	1965	Lounge chair	N/A	N/A	N/A	351	N/A	96
Takahama, Kazuhide	Kazuki	Gavina	1968	Chair	N/A	N/A	N/A	418	N/A	N/A
Takahama, Kazuhide	ESA	Gavina	1968	Seating system	N/A	N/A	N/A	350	N/A	N/A
Takahama, Kazuhide	Mantilla	Gavina	1973	Sofa	N/A	N/A	N/A	419	N/A	N/A
Tallon, Roger	Module 400	Éditions Lacloche	1964	Chair	N/A	190	N/A	378	146	N/A
Terragni, Giuseppe	Sant'Elia	Zanotta	1936	Easy chair	N/A	N/A	N/A	154	147	N/A

Terragni, Giuseppe	Follia	Zanotta	1934-36	Easy chair	N/A	N/A	N/A	155	N/A	59
Thaden, H. V.	Plywood chair	Thaden Jordan Furniture	1947	Easy chair	N/A	116	N/A	220	N/A	N/A
Thonet, August	No. 7500	Thonet	1880-83	Rocking chair	N/A	180	N/A	30	N/A	N/A
Thonet, August	No. 209	Thonet	1904	Armchair	N/A	N/A	12	N/A	N/A	
Thonet, Michael	No. 4	Thonet	1848	Chair	N/A	N/A	N/A	29	N/A	N/A
Thonet, Michael	No. 1	Thonet	1851	Rocking chair	N/A	N/A	N/A	30	N/A	N/A
Thonet, Michael	No. 14	Thonet	1859	Chair	8	24	N/A	28	148	36
Thonet, Michael	No. 14, Armchair	Thonet	1859	Armchair	N/A	N/A	N/A	29	149	N/A
Thonet, Michael	No. 17	Thonet	1862	Chair	N/A	N/A	N/A	31	N/A	N/A
Travasa, Giovanni	Palla, No. 827	Vittorio Bonacina & C.	1966	Easy chair	N/A	N/A	N/A	403	N/A	N/A
Umeda, Masanori	Getsuen	Edra	1990	Easy chair	N/A	N/A	N/A	560	150	N/A
Umeda, Masanori	Rose	Edra	1990	Easy chair	N/A	N/A	N/A	561	151	N/A
Unknown	Shaker Rocking chair	Mount Lebanon Shaker C.	1820	Rocking chair	N/A	N/A	N/A	37	N/A	37
Unknown	Indian chair, No. 1761 N	Maple & Co.	1904	Easy chair	N/A	N/A	N/A	179	N/A	N/A
Unknown	French Terrace	Everaut	1930	Chair	N/A	26	N/A	143	N/A	N/A
Unknown	Chair No. Lst 21B	Mauser-Werke	1958	Chair	N/A	N/A	N/A	312	N/A	N/A
van de Velde, Henry	Bloemenwerf	Société Henry van de Velde	1895	Chair	N/A	N/A	N/A	48	152	38
van de Velde, Henry	Havana	Société Henry van de Velde	1897	Easy chair	N/A	N/A	N/A	49	153	N/A
van de Velde, Henry	for: hair-dressing salon Haby	Société Henry van de Velde	1901	Easy Chair	N/A	N/A	N/A	50	N/A	N/A
van de Velde, Henry	for: Münchhausen apartment	Hofmöbelfabrik	1904	Chair	N/A	N/A	N/A	51	N/A	N/A
van Severen, Maarten	No. 2	Van Severen, Maarten	1992	Chair	N/A	N/A	N/A	555	N/A	N/A
Venturi, Robert	Grandmother	Knoll	1984	Sofa	N/A	N/A	N/A	488	N/A	N/A
Venturi, Robert	Art Deco	Knoll	1984	Chair	N/A	N/A	N/A	489	N/A	N/A
Venturi, Robert	Sheraton	Knoll	1984	Chair	N/A	N/A	N/A	489	N/A	N/A
Venturi, Robert	Queen Anne	Knoll	1984	Chair	N/A	198	N/A	489	N/A	86
Venturi, Robert	Chippendale	Knoll	1984	Chair	N/A	N/A	N/A	489	N/A	N/A
Volther, Poul	Corona, No. EJ 605	Eric Jørgensen	1961	Easy chair	N/A	N/A	144	393	N/A	N/A
Wagner, Otto	for: 1900 Paris Exhibition	UNK	1900	Easy chair	N/A	N/A	N/A	67	N/A	N/A
Wagner, Otto	for: telegraph office *Die Zeit*	Jacob & Josef Kohn	1902	Armchair	N/A	N/A	N/A	70	154	N/A
Wagner, Otto	for: Austrian Post Office Savings Bank	Jacob & Josef Kohn	1905-06	Armchair	N/A	N/A	N/A	71	155	N/A
Wanscher, Ole	The Colonial Chair	P. J. Furniture	1949	Easy chair	N/A	N/A	74	N/A	N/A	N/A
Warren, Thomas	Centripetal Spring	American Chair Company	1849	Office chair	N/A	62	N/A	N/A	N/A	N/A
Weber, Kem	Airline	Airline Chair Co.	1934-35	Easy chair	N/A	N/A	N/A	171	N/A	N/A
Wegner, Hans	Chinese	Fritz Hansen	1943	Chair	N/A	N/A	N/A	212	N/A	N/A
Wegner, Hans	Peacock, No. JH 50	P. P. Møbler	1947	Easy chair	N/A	N/A	N/A	213	N/A	N/A
Wegner, Hans	Round chair, No. JH 501	P. P. Møbler	1949	Chair	N/A	N/A	68	211	157	66
Wegner, Hans	Folding chair, No. JH 512	P. P. Møbler	1949	Folding chair	N/A	N/A	76	214	N/A	N/A
Wegner, Hans	Y (Wishbone)	Carl Hansen	1950	Chair	N/A	N/A	72	210	156	N/A
Wegner, Hans	Flag Halyard, No. PP 225	P. P. Møbler	1950	Easy chair	N/A	N/A	82	248	N/A	N/A
Wegner, Hans	Teddy Bear, No. PP 19	P. P. Møbler	1950	Easy chair	N/A	N/A	86	N/A	N/A	N/A
Wegner, Hans	Cow Horn, No. PP 505	P. P. Møbler	1952	Chair	N/A	N/A	96	241	N/A	N/A
Wegner, Hans	Sawhorse, No. CH 28	Carl Hansen	1952	Easy chair	N/A	N/A	94	N/A	N/A	N/A
Wegner, Hans	Valet, No. PP 250	P. P. Møbler	1953	Chair	N/A	N/A	102	240	N/A	N/A
Wegner, Hans	Ox, No. EJ 100	Eric Jørgensen	1960	Easy chair	N/A	N/A	140	356	N/A	N/A
Wegner, Hans	Shell, No. CH07	Carl Hansen	1963	Easy chair	N/A	166	150	357	N/A	N/A
Wegner, Hans	Circle, No. PP130	P. P. Møbler	1986	Easy chair	N/A	N/A	182	N/A	N/A	N/A
Wewerka, Stefan	Dreibeiniger Stuhl, No. B1	Tecta	1979	Chair	N/A	N/A	N/A	475	N/A	N/A
Wewerka, Stefan	Einschwinger, No. B5	Tecta	1982	Chair	N/A	N/A	N/A	482	N/A	N/A
Wormley, Edward	Listen to Me	Dunbar Furniture	1947	Lounge chair	N/A	N/A	N/A	234	N/A	N/A
Wright, Frank Lloyd	for: Francis W. Little House	UNK	1902	Chair	N/A	N/A	N/A	83	N/A	N/A
Wright, Frank Lloyd	for: Larkin Co. Building	Von Dorn Iron Works	1904	Office chair	N/A	N/A	N/A	85	158	45
Wright, Frank Lloyd	Armchair	UNK	1906	Easy chair	N/A	N/A	N/A	82	N/A	44

Wright, Frank Lloyd	for: Isabel Roberts House	UNK	1908	Chair	N/A	N/A	N/A	83	N/A	N/A
Wright, Frank Lloyd	Peacock	UNK	1921-22	Chair	N/A	184	N/A	86	159	N/A
Wright, Frank Lloyd	for: Johnson Wax Building	Steelcase	1936	Chair	N/A	N/A	N/A	191	N/A	N/A
Wright, Frank Lloyd	for: Donald Lovness House	UNK	1956	Chair	N/A	N/A	N/A	246	N/A	N/A
Wright, Russel	Armchair	Heywood-Wakefield	1934	Easy chair	N/A	N/A	N/A	185	N/A	N/A
Yanagi, Sori	Butterfly	Tendo Mokko	1956	Stool	N/A	160	106	267	160	77
Zanuso, Marco	Antropus	Arflex	1949	Easy chair	N/A	N/A	N/A	226	N/A	67
Zanuso, Marco	Lady	Arflex	1951	Easy chair	N/A	N/A	90	293	N/A	N/A
Zanuso, Marco	Triennale	Arflex	1951	Sofa	N/A	N/A	N/A	294	N/A	N/A
Zanuso, Marco	Martingala	Arflex	1954	Easy chair	N/A	N/A	N/A	292	N/A	N/A
Zeisel, Eva	Chair	Hudson Fixtures	1948-49	Easy chair	N/A	N/A	N/A	233	N/A	N/A
TOTAL				**639**	**50**	**86**	**96**	**586**	**144**	**98**

Legend: Sample chairs

Sources:

[1] *Fifty Chairs that Changed the World* – Selection of Modern Chairs from a design museum collection (Design Museum 2009);

[2] *100 Masterpieces from the Vitra Design Museum Collection* – Selection of Modern Chairs from a design museum collection (VDM [1996] 2013);

[3] *Chairs: 20th-Century Classics* – Compendium of Modern Chairs (Sibthorp & Quin 2012);

[4] *1000 Chairs* – Compendium of Modern Chairs (Fiell & Fiell [1997] 2012);

[5] *Chairs*– Selection of Chairs from the book *1000 Chairs* (Fiell & Fiell 2002);

[6] *Modern Chairs* – Compendium of Modern Chairs (Fiell & Fiell [1993] 1994).

Appendix 3.A.4 Portuguese Seats Database

Product					Sources (p.)						
Designer	**Name**	**Producer**	**Date**	**Type**	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
Alarcão, Filipe	Banco Solidário	UNK	2011	Stool	N/A	N/A	N/A	N/A	N/A	N/A	E
Alves, Rui	Mestre e Mestra	UNK	2012	Table & Stool	24	N/A	N/A	N/A	N/A	N/A	N/A
André, Pedro	S-Line	UNK	2012	Chair	N/A	N/A	N/A	UNK	N/A	N/A	N/A
Arruda, Miguel	AR2	Joaquim Moreira dos Santos	1975	Chair	N/A	46	N/A	N/A	N/A	N/A	N/A
Brito, Eduardo	Lacada	Movélia	1970	Chair	N/A	37	N/A	N/A	N/A	N/A	N/A
Brízio, Fernando	Pata Negra	Brízio, Fernando	2004	Stool	26	N/A	N/A	N/A	N/A	N/A	N/A
Brízio, Fernando	Alice	Galerie Kreo	2007	Stool	E	N/A	N/A	N/A	N/A	N/A	N/A
Caldas, Alexandre	Portuguese Roots	UNK	2013	Chair	N/A	N/A	N/A	N/A	N/A	N/A	E
Caramelo, Daniel	Ar Puro	Amop	2006	Urban furniture	N/A	N/A	N/A	N/A	20	N/A	N/A
Caramelo, Daniel	Lugar Comum	Amop	2011	Urban furniture	N/A	N/A	N/A	N/A	20	N/A	N/A
Carvalho, Joana	Button	Margem Ideal	2012	Chair	N/A	N/A	82	N/A	N/A	N/A	N/A
Chaves, Pedro	Cubic	Altamira	2000	Easy chair	N/A	N/A	N/A	N/A	N/A	330	N/A
Costa, Daciano	Prestígio	Metalúrgica da Longra	1962	Chair	N/A	41	N/A	N/A	N/A	N/A	N/A
Costa, Daciano	Cortez	Metalúrgica da Longra	1962	Chair (Series)	N/A	N/A	N/A	N/A	N/A	N/A	E
Costa, Daciano	Superligeira	UNK	1963	Chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Costa, Daciano	Tabuado	Julcar	1995	Bench	N/A	N/A	N/A	N/A	22	378	N/A
Costa, Rui & Vidigal, Rui	BigZig	IETA Design	2000	Bench	N/A	N/A	N/A	N/A	N/A	388	N/A
Costa e Silva, Mariana	Cut Chair	Millplan	2007	Chair	16	N/A	N/A	N/A	N/A	N/A	N/A
Cruz Carvalho, José	Cadeira sem braços	Interforma	1970	Easy chair	N/A	42	N/A	N/A	N/A	N/A	N/A
Cunca, Raul	Crisálida	Faber Polis	1992	Chair	N/A	51	N/A	N/A	N/A	N/A	N/A
Escobar, Ana	O Banco	Projecto em Aberto	2013	Stool	26	N/A	N/A	N/A	N/A	N/A	N/A
Espinho, José	Bélgica	Móveis Olaio	1960	Chair	N/A	36	N/A	N/A	N/A	N/A	N/A
Espinho, José	Prefa	Móveis Olaio	1970	Swivel chair	N/A	29	N/A	N/A	N/A	N/A	N/A
Garcia, António	Osaka'70	Móveis Sousa Braga	1970	Chair	15	38	N/A	N/A	N/A	N/A	E
Giestas, Luís	Terraplana	UNK	2010	Stool	16	N/A	N/A	N/A	N/A	N/A	N/A
Gomes, Pedro	Bounce	UNK	2012	Chair	N/A	N/A	N/A	UNK	N/A	N/A	N/A
Gonçalves, João	Serena	Cadeiras Machado	2012	Chair	E	N/A	30	N/A	N/A	N/A	N/A
Grilo, Toni	Line	Riluc	2011	Chair	E	55	N/A	N/A	N/A	N/A	N/A
Kumagai, Alexandre	Phersu	N/A	2012	Chair	N/A	N/A	40	N/A	N/A	N/A	N/A
Ladeiro, Nuno	Filândia	Calligaris	1998	Chair	N/A	54	N/A	N/A	N/A	N/A	N/A
Ladeiro, Nuno	Lora Lora	Dimensão/EMU	2001	Easy chair & Ottoman	N/A	N/A	N/A	N/A	N/A	328	N/A
Lino, Raul	for: Casa do Cipreste	UNK	1915	Chair	N/A	17	N/A	N/A	N/A	N/A	N/A
Lino, Raul	for: Casa do Cipreste	UNK	1915	Armchair	E	N/A	N/A	N/A	N/A	N/A	N/A
Lourenço, Vitor	Urbeconcept	Sienave	2000	Bench	N/A	N/A	N/A	N/A	N/A	393	N/A
Macedo, Gustavo	Careto	Fernando Dias da Silva & Filhos	2012	Chair	29	N/A	86	N/A	N/A	N/A	N/A
Machado, Gastão	Cadeira para Crianças	Móveis Olaio	1978	Child's chair	N/A	40	N/A	N/A	N/A	N/A	N/A
Martins, Alexandra	One in three chairs	N/A	2012	Seating system	N/A	N/A	68	N/A	N/A	N/A	N/A
Neves, Paulo	"A"	N/A	2012	Chair	N/A	N/A	94	N/A	N/A	N/A	N/A
Parra, Paulo	Sela Portuguesa	Oficina Oxigénio	1996	Stool	26	N/A	N/A	N/A	N/A	N/A	N/A
Parra, Paulo	Essêncial	Oficina Oxigénio	1999	Chair	N/A	53	N/A	N/A	N/A	N/A	N/A
Parra, Paulo	Monte	UNK	2005	Chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Parra, Paulo	Suave	Oficina Oxigénio	2009	Garden chair	N/A	32	N/A	N/A	N/A	N/A	N/A
Pera, Daniel	Bita	UNK	2012	Chair	N/A	N/A	N/A	UNK	N/A	N/A	N/A
Pereira, Magda Alves	Benjamim (linha)	Cerne	2012	Chair	N/A	N/A	N/A	N/A	15*	N/A	N/A
Pinto, André	Alba	Adico	2009	Chair	N/A	N/A	N/A	N/A	13*	N/A	N/A
Pinto, Sérgio	Hinge	Julcar	2010	Auditorium chair	N/A	N/A	N/A	N/A	22	N/A	N/A

Providência, Francisco	Poli	Julcar	1995	Chair	N/A	N/A	N/A	N/A	22	N/A	N/A
Providência, Francisco	Liber	Julcar	1998	Library Chair	N/A	N/A	N/A	N/A	N/A	336	N/A
Providência, Francisco	Natura	Julcar	1998	Stacking chair & Table	E	N/A	N/A	N/A	N/A	314	N/A
Prudêncio, Gonçalo	Munge	UNK	2009	Stool	E	N/A	N/A	N/A	N/A	N/A	N/A
Ralheta, Henrique	Banco *Itálico*	Mousse	2004	Stool	24	N/A	N/A	N/A	N/A	N/A	N/A
Ramalho, Raul	Império	Metalúrgica da longra	1955	Chair	N/A	23	N/A	N/A	N/A	N/A	N/A
Ramos, João	Dustnest	N/A	2012	Easy chair	N/A	N/A	90	N/A	N/A	N/A	N/A
Ribeiro, Luís	Walking	Agostinho Figueiredo e Filho	2012	Chair	N/A	N/A	N/A	UNK	N/A	N/A	N/A
Rios, Miguel	Pirson	UNK	2010	Chair	E	N/A	N/A	N/A	24	N/A	N/A
Rodrigues dos Santos, Gonçalo	Gonçalo	Arcalo	1940's	Garden chair	E	31	N/A	N/A	N/A	N/A	E
Rodrigues, Eduardo	Ava	Adico	2007	Chair	N/A	N/A	N/A	N/A	13	N/A	N/A
Salvador, Fernnado	Atalaia	Loja da Atalaia	1986	Easy chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Salvador, Fernnado & Nunes, Margarida	CA2	FAGO	1994	Dining chair	N/A	49	N/A	N/A	N/A	N/A	N/A
Sena da Silva, António	Sena	Móveis Olaio	1972	Stacking chair	9	39	N/A	N/A	N/A	N/A	E
Silva, Conceição	Cadeira	N/A	1965	Armchair	E	N/A	N/A	N/A	N/A	N/A	N/A
Silva, Hugo	Serpentine	Zero2	2009	Sofa	N/A	N/A	N/A	N/A	26	N/A	N/A
Silva Dias, Pedro	Mitsuhirato	Loja da Atalaia	1988	Easy chair	N/A	N/A	N/A	N/A	N/A	N/A	229
Silva Dias, Pedro	Bacará	Loja da Atalaia	1996	Easy chair	N/A	52	N/A	N/A	N/A	N/A	268
Silva Dias, Pedro	Dobra	Mínima	2000	Chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Silva Dias, Pedro	Corqui	SUSdesign	2008	Lounge chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Siza Vieira, Álvaro	Santiago	SPSS Design	2000	Stool	E	N/A	N/A	N/A	N/A	N/A	N/A
Sottomayor, Pedro	Uni_net	Nautilus	2005	Classroom chair	N/A	N/A	N/A	N/A	25	N/A	N/A
Sottomayor, Pedro	Crush	HV	2010	Lounge chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Sousa Santos, Marco	Al-Dual	Protodesign	1991	Chair	N/A	50	N/A	N/A	N/A	N/A	N/A
Sousa Santos, Marco	Alma	Alma Home	2001	Easy chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Sousa Santos, Marco	Shell	UNK	2009	Lounge chair	9	N/A	N/A	N/A	N/A	N/A	N/A
Sousa Santos, Marco	R&B2	UNK	2011	Easy chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Taveira, Tomás	Rick	UNK	1985	Artwork	N/A	N/A	N/A	N/A	N/A	N/A	196
Taveira, Tomás	Silvia	UNK	1990	Atrwork	E	N/A	N/A	N/A	N/A	N/A	N/A
Távora, Fernando	Cadeira para sala de jantar	Ribeiro da Silva, Lda	1956	Chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Tojal, Raul	Nicola	UNK	1930's	Chair	N/A	21	N/A	N/A	N/A	N/A	N/A
Torrão, Mariana	Cadeiralongada	Flex 2000 - Grupo Cordex	2001	Sofa	N/A	N/A	N/A	N/A	N/A	324	N/A
Trindade, Jorge	Axis	Larus	2000	Bench	N/A	N/A	N/A	N/A	N/A	382	N/A
UNK	Eco	Abrakadabra	2011	Child's chair	N/A	N/A	N/A	N/A	12	N/A	N/A
UNK	Ergos	Nautilus	2004	Child's chair	N/A	N/A	N/A	N/A	25	N/A	N/A
Valente, Carla	ESP2	Duraplás	1972	Easy chair	E	N/A	N/A	N/A	N/A	N/A	N/A
Viana, Alexandre & Mendes, Carla	Relax	Coelho & Martins Lda	2002	Lounge chair	N/A	N/A	N/A	N/A	N/A	310	N/A
Viana, José	Facie	Protodesign	1988	Chair	E	48	N/A	N/A	N/A	N/A	N/A
Viana, José	D&D	UNK	2004	Chair	8	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL				**85**	**34**	**22**	**7**	**4**	**13**	**10**	**9**

Legend: **Sample chairs**

Sources:

[1] *Como se Pronuncia Design em Português?* – Portuguese design exhibition (Coutinho 2015);

[2] *Sentar Portugal: 23 Cadeiras da Colecção Paulo Parra* – Portuguese chair design exhibition (Parra 2011);

[3] *Art on Chairs - International Design Competition* – International chair design competition, 1st to 4th places (Branco 2012);

[4] *Design and Design Award* – International design competition, 2012 (Praquin 2013);

[5] *Ordem de Compra: O design e a indústria portugueses na economia actual - exemplos de sucesso* – Portuguese design exhibition (Experimentadesign 2011);

[6] *Best of: 180 Produtos de Design Português* – Compendium of Portuguese Design (Centro Português de Design 2003);

[7] *MUDE - Permanent Exhibition* – International design exhibition, 1999-2014 (Brunhaumer, Capelo & Museu do Design 1999; MUDE 2014)

Appendix 3.A.5 Thonet Chairs Database

Designer	Name	Producer	Date	Type
Michael Thonet	No. 4	Thonet Australia	1849	Chair
Michael Thonet	No. 1	Gebrüder Thonet Vienna	1850	Chair
Michael Thonet	No. 14 (214)	Thonet GmbH	1859	Chair
Michael Thonet	No. 15 (215)	Thonet GmbH	1859	Chair
Michael Thonet	No. 16	Thonet New Zealand	1859	Chair
August Thonet	No. 18 (218)	Thonet GmbH	1876	Chair
TOTAL				**6**

Legend:	Sample chairs

Appendix 3.B Sample

Appendix 3.B.1 Sample Database

CHAIR			DESIGN			
ID	**Name**	**Model**	**Date**	**Designer**	**Nationality**	**Birth-death**
DC1	Alvor-Grill	N/A	1966-68	Daciano da Costa	Portuguese	1930-2005
DC2	Alvor-Coffeeshop	N/A	1966-68	Daciano da Costa	Portuguese	1930-2005
DC3	Palace	N/A	1970-71	Daciano da Costa	Portuguese	1930-2005
DC4	Penta-Restaurant	N/A	1971-75	Daciano da Costa	Portuguese	1930-2005
DC5	Tripeça	N/A	1972-77	Daciano da Costa	Portuguese	1930-2005
DE6	Costureira	N/A	1970	Daciano da Costa	Portuguese	1930-2005
JC1/ICB22	Ply	Open-back	1988	Jasper Morrison	British	1959-
JC2	Basel	Chair	2008	Jasper Morrison	British	1959-
JC3	Bac	Armchair	2009	Jasper Morrison	British	1959-
JC4	HAL	Wood	2007-10	Jasper Morrison	British	1959-
JC5	Lightwood	2532-20	2011	Jasper Morrison	British	1959-
JE6	La Tourette	N/A	1997	Jasper Morrison	British	1959-
ICA1/TC1	214	N/A	1859	Michael Thonet	German/Austrian	1796-1871
ICA2	S33	N/A	1926	Mart Stam	Dutch	1899-1986
ICA3	Zig-Zag	280	1932-34	Gerrit Rietveld	Dutch	1888-1964
ICA4	Landi	N/A	1938	Hans Coray	Swiss	1906-1991
ICA5	DCW	Eames Molded Plywood DCW	1945	Charles & Ray Eames	American	1907–78; 1912–88
ICA6	DAX	Eames Molded Plastic Armchair 4-Leg	1948-1950	Charles & Ray Eames	American	1907–78; 1912–88
ICA7	DKR	Eames Wire Chair	1951	Charles & Ray Eames	American	1907–78; 1912–88
ICA8	Tulip	Armless Chair	1955-56	Eero Saarinen	Finnish/American	1910-1961
ICA9	Superleggera	699	1951-57	Gio Ponti	Italian	1891-1979
ICA10	Polyside	N/A	1962-63	Robin Day	British	1915-2010
ICA11	Bofinger	BA 1171	1964-65	Helmut Bätzner	German	1928-2010
ICA12	Universale	4867	1965-67	Joe Colombo	Italian	1930-1971
ICA13	Panton	N/A	1959-67	Verner Panton	Danish	1926-1998
ICB14	Wishbone (Y)	CH24	1949	Hans Wegner	Danish	1914-2007
ICB15	Antelope	N/A	1950	Ernest Race	British	1913-1964
ICB16	Bellevue	UNK	1951	André Bloc	French	1896-1966
ICB17	Ant	3100	1952	Arne Jacobsen	Danish	1902-1971
ICB18	Swag Leg (DAF)	Armchair	1956-58	George Nelson	American	1908–1986
ICB19	PK9	N/A	1960	Poul Kjærholm	Danish	1929-1980
ICB20	Spaghetti	101	1979	Giandomenico Belotti	Italian	1922-2004
ICB21	S	Chair	1988	Tom Dixon	British	1959-
ICB23	RCP2	Adult	1992	Jane Atfield	British	1964-
ICB24	Magic	N/A	1997	Ross Lovegrove	British	1958-
ICB25	Chair_One	Stacking chair	2003	Konstantin Grcic	German	1970-
IPCB26	Gonçalo	Original	1953	Gonçalo Santos	Portuguese	UNK
IE27	Omkstak	Chair	1971	Rodney Kinsman	British	1943-
IE28	Wiggle	Side Chair	1972	Frank Gehry	Canadian/American	1929-
IE29	Queen Anne	Side Chair	1979-84	Robert Venturi	American	1925-
IE30	Louis 20	Chair	1991	Philippe Starck	French	1949-
IE31	FPE	8009	1997	Ron Arad	Israeli	1951-
IE32	Air-Chair	N/A	1999	Jasper Morrison	British	1959-
ISE1	Stool 60	N/A	1932-33	Alvar Aalto	Finnish	1898-1976
TC2	215	215 R	1859	Michael Thonet	German/Austrian	1796-1871
TC3	218	N/A	1876	August Thonet	Austrian	1829-1910
TE4	Muji No. 14	No. 18013180	2009	James Irvine	British	1958-2013

CHAIR	PRODUCTION								
ID	Date	Producer	Founded-defunct	Headquarters	Production type	Producer II	Date	Producer III	Date
DC1	1966-68, 1970	Móveis Sousa Braga	1887-UNK	Portugal	Mass prod.	Metalúrgica Longra	1970	Uniforma (m. Fago)	1992
DC2	1966-68	Móveis Sousa Braga	1887-UNK	Portugal	Small batch	N/A	N/A	N/A	N/A
DC3	1970-71	Móveis Sousa Braga	1887-UNK	Portugal	Mass prod.	Uniforma (m. Fago)	1992	N/A	N/A
DC4	1971-75	Móveis Sousa Braga	1887-UNK	Portugal	Small batch	N/A	N/A	N/A	N/A
DC5	1972-77	Móveis Sousa Braga	1887-UNK	Portugal	Small batch	N/A	N/A	N/A	N/A
DE6	1970	Móveis Sousa Braga	1887-UNK	Portugal	Mass prod.	N/A	N/A	N/A	N/A
JC1/ICB22	1989-UNK	Vitra	1950-	Switzerland	Mass prod.	N/A	N/A	N/A	N/A
JC2	2008-	Vitra	1950-	Switzerland	Mass prod.	N/A	N/A	N/A	N/A
JC3	2009-	Cappellini	1946-	Italy	Mass prod.	N/A	N/A	N/A	N/A
JC4	2010-	Vitra	1950-	Switzerland	Mass prod.	N/A	N/A	N/A	N/A
JC5	2011-	Maruni	1928-	Japan	Mass prod.	N/A	N/A	N/A	N/A
JE6	1997, 2015-	Hubert Weinzierl	1982	France	Mass prod.	N/A	N/A	N/A	N/A
ICA1/TC1	1859-	Thonet GmbH	1853-	Germany	Mass prod.	Thonet Vienna	1976-	N/A	N/A
ICA2	1926-	Thonet GmbH	1853-	Germany	Mass prod.	N/A	N/A	N/A	N/A
ICA3	1973-	Metz & Co.	1927-	Italy	Mass prod.	Metz & Co.	1935-55	N/A	N/A
ICA4	2015-	Vitra	1950-	Switzerland	Mass prod.	P. & W. Blattmann	1939-99	Zanotta	1971-UNK
ICA5	1949-	Herman Miller	1923-	USA	Mass prod.	Vitra	UNK-	Evans Products Co.	1946-49
ICA6	1950-89, 2004-	Herman Miller	1923-	USA	Mass prod.	Vitra	UNK-	N/A	N/A
ICA7	1951-	Herman Miller	1923-	USA	Mass prod.	Vitra	UNK-	N/A	N/A
ICA8	1956-	Knoll	1938-	USA	Mass prod.	N/A	N/A	N/A	N/A
ICA9	1957-	Cassina	1927-	Italy	Mass prod.	N/A	N/A	N/A	N/A
ICA10	1963-	Hille	1906-	UK	Mass prod.	N/A	N/A	N/A	N/A
ICA11	1966-84	Wilhelm Bofinger	UNK	Germany	Mass prod.	N/A	N/A	N/A	N/A
ICA12	1968-UNK	Kartell	1949-	Italy	Mass prod.	N/A	N/A	N/A	N/A
ICA13	1999-	Vitra	1950-	Switzerland	Mass prod.	Vitra	1968-	Herman Miller	1968-1975
ICB14	1950-	Carl Hansen & Son	1908-	Denmark	Mass prod.	N/A	N/A	N/A	N/A
ICB15	1951-	Race Furniture	1945-	UK	Mass prod.	N/A	N/A	N/A	N/A
ICB16	UNK	UNK	N/A	N/A	Small batch	N/A	N/A	N/A	N/A
ICB17	1952-	Fritz Hansen	1872-	Denmark	Mass prod.	N/A	N/A	N/A	N/A
ICB18	1958-64, 2006-	Herman Miller	1923-	USA	Mass prod.	N/A	N/A	N/A	N/A
ICB19	1960-	Fritz Hansen	1872-	Denmark	Mass prod.	N/A	N/A	N/A	N/A
ICB20	1979-	Alias	1979-	Italy	Mass prod.	N/A	N/A	N/A	N/A
ICB21	1992-	Cappellini	1946-	Italy	Mass prod.	SPACE	1988-UNK	N/A	N/A
ICB23	1996-UNK	Made of Waste	1993-1998	UK	Small batch	N/A	N/A	N/A	N/A
ICB24	1997-UNK	Fasem	UNK	Italy	Mass prod.	N/A	N/A	N/A	N/A
ICB25	2003-	Magis	1976-	Italy	Mass prod.	N/A	N/A	N/A	N/A
IPCB26	1953-	Arcalo	UNK	Portugal	Mass prod.	Adico	1930s-	N/A	N/A
IE27	Mid-1990s-	OMK Design	1964-	UK	Mass prod.	Bieffeplast	1972-mid-90s	N/A	N/A
IE28	1986-	Vitra	1950-	Switzerland	Mass prod.	Jack Brogan	1972-73	N/A	N/A
IE29	1984-UNK	Knoll	1938-	USA	Mass prod.	N/A	N/A	N/A	N/A
IE30	1991-UNK	Vitra	1950-	Switzerland	Mass prod.	N/A	N/A	N/A	N/A
IE31	1997-UNK	Kartell	1949-	Italy	Mass prod.	N/A	N/A	N/A	N/A
IE32	2000-	Magis	1976-	Italy	Mass prod.	N/A	N/A	N/A	N/A
ISE1	1933-	Artek	1935-	Finland	Mass prod.	Huonekalu-ja R.	1933-35	N/A	N/A
TC2	1859-	Thonet GmbH	1853-	Germany	Mass prod.	N/A	N/A	N/A	N/A
TC3	1876-	Thonet GmbH	1853-	Germany	Mass prod.	Thonet Vienna	1976-	N/A	N/A
TE4	2009-	Muji/Thonet	1980-	Japan	Mass prod.	N/A	N/A	N/A	N/A

CHAIR	COMMERCIALIZATION		CLIENT	
ID	**Shop**	**Price**	**Company**	**Context**
DC1	Metalúrgica da Longra	N/A	Salvor - Soc. de Investimentos Hoteleiros	Hotel Alvor Praia, Restaurante-Grill (Faro, Portugal)
DC2	N/A	N/A	Salvor - Soc. de Investimentos Hoteleiros	Hotel Alvor Praia, Coffee-shop (Faro, Portugal)
DC3	Uniforma, 1992	N/A	Lignum	Hotel Madeira Hilton, Restaurant (Funchal, Portugal)
DC4	N/A	N/A	Soteis - Soc. Internacional de Turismo	Hotel Penta, Restaurant (Lisbon, Portugal)
DC5	N/A	N/A	Soc. de Investimentos Turísticos na Madeira	Casino Park Hotel, Bedroom (Funchal, Portugal)
DE6	Metalúrgica da Longra	UNK	Móveis Sousa Braga	N/A
JC1/ICB22	N/A	N/A	UNK	Berlin Design Werkstadt exhibition (Berlin, Germany)
JC2	Vitra DE	€ 340.00	UNK	N/A
JC3	Various	UNK	UNK	N/A
JC4	Vitra DE	€ 516.00	Vitra (Edition project)	N/A
JC5	Various	UNK	Maruni	N/A
JE6	Hubert Weinzierl	€ 1,800.00	UNK	Couvent de La Tourette, Refectory (Éveux, France)
ICA1/TC1	Thonet GmbH DE	€ 696.15	N/A	N/A
ICA2	Thonet GmbH DE	€ 999.60	UNK	UNK
ICA3	Various	UNK	Metz & Co (manufacturer)	N/A
ICA4	Vitra DE	€ 446.00	UNK	Swiss National Exhibition 1939 (Zurich, Switzerland)
ICA5	Herman Miller	$889.00	Herman Miller	N/A
ICA6	Herman Miller	$459.00	UNK	*Low Cost Furniture Design* competition 1948 (MoMA)
ICA7	Herman Miller	$779.00	Herman Miller	UNK
ICA8	Knoll	$1,438.00	Knoll	UNK
ICA9	Various	UNK	UNK	UNK
ICA10	Hille	£73.00	Hille	N/A
ICA11	N/A	N/A	UNK	State Theater (Karlsruhe, Germany)
ICA12	N/A	N/A	UNK	UNK
ICA13	Vitra DE	€ 229.00	Vitra	N/A
ICB14	Various	UNK	Carl Hansen & Son	N/A
ICB15	Race Furniture	£356.00 +VAT	UNK	Festival of Britain 1951 (UK)
ICB16	N/A	N/A	N/A	Bellevue House (Meudon, France)
ICB17	Fritz Hansen	€ 455.00	UNK	Canteen at Novo Nordisk (Bagsværd, Denmark)
ICB18	Herman Miller	$599.00	UNK	N/A
ICB19	Fritz Hansen	€ 4,588.00	UNK	N/A
ICB20	Alias	UNK	Alias	N/A
ICB21	Various	UNK	UNK	N/A
ICB23	N/A	N/A	UNK	N/A
ICB24	N/A	N/A	UNK	N/A
ICB25	Herman Miller	$534.50	UNK	N/A
IPCB26	Arcalo	€ 77.50	UNK	N/A
IE27	OMK Design	£108.00	UNK	N/A
IE28	Vitra DE	€ 757.00	UNK	N/A
IE29	N/A	N/A	UNK	N/A
IE30	N/A	N/A	UNK	N/A
IE31	N/A	N/A	UNK	N/A
IE32	Herman Miller	$174.75	UNK	N/A
ISE1	Artek	UNK	UNK	Viipuri Library (Vyborg, Russia)
TC2	Thonet GmbH DE	UNK	UNK	N/A
TC3	Thonet GmbH DE	UNK	UNK	N/A
TE4	Muji	¥33,000.00	Muji	N/A

CHAIR	FUNCTIONS		MATERIALS		COLOUR
ID	Stackable Units	In/Outdoor	Frame	Support	
DC1	N/A	Indoor	Wood, Solid, Pau-santo	Textile, Upholstery, Leather	Natural, Black
DC2	N/A	Indoor	Wood, Solid, UNK	Textile, Upholstery, Leather	Natural, Red
DC3	N/A	Indoor	Wood, Solid, Andiroba	Textile, Woven, Cane	Natural
DC4	N/A	Indoor	Wood, Solid, Beech	Textile, Upholstery, Fabric	UNK
DC5	N/A	Indoor	Wood, Solid, UNK	Textile, Upholstery, Fabric	White, blue
DE6	N/A	Indoor	Wood, Solid, Beech	Textile, Upholstery, Leather	Natural
JC1/ICB22	N/A	Indoor	Wood, Plywood, UNK	Wood, Plywood, UNK	Natural
JC2	N/A	Indoor	Wood, Solid, Beech	Plastic, ASA	Natural & Cream, …
JC3	N/A	Indoor	Wood, Solid, Ash	Wood, Plywood, Ash	Natural & White, …
JC4	N/A	In/Outdoor	Wood, Solid, Oak	Plastic, Polypropylene	Natural & White, …
JC5	N/A	Indoor	Wood, Solid, Maple	Plastic, Polyester Mesh	Natural & White, …
JE6	N/A	Indoor	Wood, Solid, Oak	Wood, Solid, Oak	Natural
ICA1/TC1	N/A	Indoor	Wood, Solid, Beech	Textile, Woven, Cane	Black, …
ICA2	N/A	Indoor	Metal, Tubular, Steel	Textile, Leather	Black, …
ICA3	N/A	Indoor	Wood, Solid, Cherry	Wood, Solid, Cherry	Natural, …
ICA4	6	In/Outdoor	Metal, Profile, Aluminium	Metal, Sheet, Aluminium	Natural
ICA5	N/A	Indoor	Wood, Plywood, Birch	Wood, Plywood, Birch	Natural, …
ICA6	N/A	Indoor	Metal, Tubular, Steel	Plastic, Polypropylene	Green, …
ICA7	N/A	Indoor	Metal, Rod, Steel	Metal, Wire, Steel	Natural
ICA8	N/A	Indoor	Metal, Die-cast, Aluminium	Plastic, Fibreglass reinforced plastic	White & Red, …
ICA9	N/A	Indoor	Wood, Solid, Ash	Textile, Woven, Cane	Natural & Black, …
ICA10	UNK	Indoor	Metal, Tubular, Steel	Plastic, Polypropylene	Orange, …
ICA11	UNK	In/Outdoor	Plastic, Polyester	Plastic, Polyester	Yellow, …
ICA12	3	In/Outdoor	Plastic, Polypropylene	Plastic, Polypropylene	White, …
ICA13	UNK	In/Outdoor	Plastic, Polypropylene	Plastic, Polypropylene	Red, …
ICB14	N/A	Indoor	Wood, Solid, Oak	Textile, Woven, Paper Cord	Natural, …
ICB15	N/A	In/Outdoor	Metal, Rod, Steel	Wood, Plywood, Gabon	White, …
ICB16	N/A	Indoor	Metal, Tubular, Steel	Wood, Plywood, UNK	Natural, …
ICB17	UNK	Indoor	Metal, Tubular, Steel	Wood, Plywood, Beech	Natural, …
ICB18	N/A	Indoor	Metal, Tubular, Steel	Plastic, Polypropylene	White
ICB19	N/A	Indoor	Metal, Bar, Steel	Textile, Upholstery, Leather & Nylon (filling)	Black, …
ICB20	N/A	Indoor	Metal, Tubular, Steel	Plastic, PVC	Black, …
ICB21	N/A	Indoor	Metal, Tubular, Steel	Textile, Woven, Marsh Straw	Natural, …
ICB23	N/A	UNK	Plastic, Sheet, HDPE (recycled bottles)	Plastic, Sheet, HDPE (recycled bottles)	Multi-coloured
ICB24	UNK	UNK	Metal, Tubular, Steel	Plastic, Polyurethane	Black, …
ICB25	UNK	In/Outdoor	Metal, Profile, Aluminium	Metal, Die-cast, Aluminium	Black, …
IPCB26	10	Outdoor	Metal, Tubular, Steel	Metal, Sheet, Steel	Green, …
IE27	25	In/Outdoor	Metal, Tubular, Steel	Metal, Sheet, Steel	Red
IE28	N/A	Indoor	Paper, Sheet, Cardboard & Hardboard	Paper, Sheet, Cardboard & Hardboard	Natural
IE29	N/A	Indoor	Wood, Plywood, Maple	Wood, Plywood, Maple	“Grandmother” pattern
IE30	11	In/Outdoor	Metal, Tubular, Aluminium	Plastic, Polypropylene	Dark, …
IE31	8	In/Outdoor	Metal, Profile, Aluminium	Plastic, Polypropylene	Red
IE32	10	In/Outdoor	Plastic, Polypropylene & Fibreglass	Plastic, Polypropylene & Fibreglass	Orange, …
ISE1	UNK	Indoor	Wood, Plywood, Birch	Wood, Solid, Birch	Natural
TC2	N/A	Indoor	Wood, Solid, Beech	Textile, Woven, Cane	Brown, …
TC3	N/A	Indoor	Wood, Solid, Beech	Textile, Woven, Cane	Black, …
TE4	N/A	Indoor	Wood, Solid, Beech	Wood, Plywood, Beech	Brown, …

CHAIR	MANUFACTURING TECHNIQUES				
ID	**Shaping (frame)**	**Shaping (support)**	**Joining**	**Finishing (frame)**	**Finishing (support)**
DC1	Cutting	Upholstering	UNK	UNK	UNK
DC2	Cutting	Upholstering	UNK	UNK	UNK
DC3	Cutting	Hand Weaving	UNK	UNK	UNK
DC4	Cutting	Upholstering	UNK	UNK	UNK
DC5	Cutting	Upholstering	UNK	UNK	UNK
DE6	Cutting	Upholstering	UNK	UNK	UNK
JC1/ICB22	Cutting	Cutting	Screwing, gluing	Veneer (birch)	Veneer (birch)
JC2	UNK	UNK	UNK	N/A	UNK
JC3	UNK	UNK	UNK	UNK	UNK
JC4	UNK	Moulding	UNK	Varnishing	UNK
JC5	UNK	UNK	UNK	Urethane-coated	UNK
JE6	UNK	UNK	UNK	Varnishing	Varnishing
ICA1/TC1	Bending	Hand Weaving	Screwing	UNK	UNK
ICA2	Bending	UNK	UNK	Chrome-plating	N/A
ICA3	Cutting	Cutting	Dovetail, doweling, mitre	Polishing	Polishing
ICA4	Bending	Moulding, Compression	Welding, screwing	Anodizing	Anodizing
ICA5	Moulding, Compres-sion	Moulding, Compression	UNK	Veneer (Walnut)	Veneer (Walnut)
ICA6	Bending	Moulding	UNK	UNK	UNK
ICA7	Bending	Bending	Welding	Chrome-plating	Chrome-plating
ICA8	Moulding	Moulding	UNK	Plastic-coated	Plastic-coated
ICA9	UNK	Hand Weaving	Doweling	N/A/lacquering	UNK
ICA10	Bending	Moulding, Injection	UNK	Powder-coated/chrome	UNK
ICA11	Moulding, Compres-sion	Moulding, Compression	N/A	N/A	N/A
ICA12	Moulding, Injection	Moulding, Injection	Screwing	UNK	UNK
ICA13	Moulding, Injection	Moulding, Injection	N/A	Lacquering	N/A
ICB14	Steam-bending	Hand Weaving	UNK	Soap, …	UNK
ICB15	Bending	Moulding	UNK	Powder-coated/lacquering	N/A/lacquering
ICB16	Bending	Bending	UNK	Varnishing	UNK
ICB17	Bending	Moulding, Compression	UNK	Chrome-plating	Veneer (cherry, …)
ICB18	Swaging	Moulding (Eames patent-ed)	UNK	Chrome	UNK
ICB19	UNK	Upholstering	UNK	Satin-brushed	UNK
ICB20	UNK	Hand Weaving	Welding	Powder-coated/chrome	N/A
ICB21	Bending	Hand Weaving	Welding	Lacquering	UNK
ICB23	Cutting	Cutting	Screwing	UNK	UNK
ICB24	UNK	Moulding	UNK	Painting/chrome	N/A
ICB25	UNK	Moulding	UNK	Polishing/anodizing/painting	Polishing/painting
IPCB26	Bending	Bending	Welding	Painting	Painting
IE27	Bending	Pressing	UNK	Powder-coated/chrome	Epoxy-coated
IE28	UNK	UNK	Screwing, gluing	N/A	N/A
IE29	Cutting, bending	Cutting, bending	UNK	Laminate (plastic)	Laminate (plastic)
IE30	Bending	Moulding, Blow	UNK	Polishing	UNK
IE31	UNK	Moulding, Injection	UNK	Painting	UNK
IE32	Moulding, Air	Moulding, Air	N/A	UNK	UNK
ISE1	Bending	Cutting	Screwing	Lacquering	Lacquering
TC2	Bending	Hand Weaving	Screwing	UNK	UNK
TC3	Bending	Hand Weaving	Screwing	UNK	UNK
TE4	Bending	Cutting	Screwing	Urethane resin painting	UNK

CHAIR	DIMENSIONS					TYPE					
ID	Width	Depth	Height	Seat Height	Weight (Kg)	Legs	Seat	Back	Stretchers	Base	Arms
DC1	615	520	780	427	UNK	4	□	●	Ø	Ø	2
DC2	600	478	692	470	UNK	3F	Φ	II	Ø	Ø	2
DC3	618	550	775	431	UNK	4	□	●	Ø	II	2
DC4	570	480	680	UNK	UNK	4	Φ	●	Ø	Ø	Ø
DC5	470	423	720	440	UNK	3F	Φ	1	Ø	Ø	Ø
DE6	456	403	679	430	UNK	4	□	O	II	Ø	Ø
JC1/ICB22	395	470	845	475	UNK	4	□	O	Ø	Ø	Ø
JC2	425	470	800	460	UNK	4	O	●	Ø	Ø	Ø
JC3	525	510	730	455	UNK	4	Φ	●	Ø	Ø	2
JC4	475	510	795	435	UNK	4	Δ	●	Ø	Ø	Ø
JC5	468	467	782	450	UNK	4	□	●	H	Ø	Ø
JE6	410	453	765	470	8,50	4	□	=	1	II	Ø
ICA1/TC1	430	520	840	460	2,85	4	O	=	O	Ø	Ø
ICA2	500	640	840	460	UNK	2F	□	●	Ø	U	Ø
ICA3	370	430	740	430	UNK	2F	Δ	●	Ø	●	Ø
ICA4	515	650	795	475	3,00	4	□	●	Ø	Ø	2
ICA5	502	552	730	451	UNK	4	Δ	●	Ø	Ø	Ø
ICA6	635	610	800	457	UNK	4	O	●	Ø	Ø	2
ICA7	483	540	832	455	UNK	4	Δ	#	X	Ø	Ø
ICA8	508	540	813	470	UNK	1C	O	●	Ø	●	Ø
ICA9	410	450	830	460	1,70	4	Δ	=	O	Ø	Ø
ICA10	530	505	745	440	UNK	2	O	●	Ø	Ø	Ø
ICA11	525	535	750	440	4,00	4	Δ	●	Ø	Ø	Ø
ICA12	420	500	710	430	3,40	4	□	●	Ø	Ø	Ø
ICA13	500	610	830	410	UNK	2F	□	●	Ø	U	Ø
ICB14	550	510	750	450	UNK	4	Δ	II	O	Ø	2
ICB15	500	530	800	450	6,00	4	O	II	II	Ø	2
ICB16	395	490	825	420	UNK	4	Δ	●	U	Ø	Ø
ICB17	510	480	780	440	UNK	3B	O	●	Ø	Ø	Ø
ICB18	711	559	813	457	UNK	1C	O	●	Ø	X	2
ICB19	560	600	760	430	UNK	1C	Δ	●	Ø	3*	Ø
ICB20	400	510	840	460	UNK	4	□	●	H	Ø	Ø
ICB21	500	420	1020	470	UNK	2F	Δ	●	Ø	O	Ø
ICB23	373	435	810	UNK	UNK	4+	□	●	Ø	Ø	Ø
ICB24	560	570	800	470	10,00	2B	□	●	Ø	II	Ø
ICB25	550	590	820	450	UNK	4	Δ	X	Ø	Ø	Ø
IPCB26	520	540	720	420	6,50	4	Φ	●	Ø	Ø	2
IE27	555	495	750	450	4,88	4	□	●	Ø	II	Ø
IE28	350	610	870	430	UNK	4	□	●	●	●	Ø
IE29	676	603	978	473	UNK	4	Δ	II	Ø	Ø	Ø
IE30	470	546	843	467	UNK	4	Δ	●	Ø	Ø	Ø
IE31	430	590	780	460	3,75	4	□	●	Ø	Ø	Ø
IE32	490	510	775	470	UNK	4	□	●	Ø	Ø	Ø
ISE1	380	380	440	440	UNK	3	O	N/A	Ø	Ø	Ø
TC2	430	520	840	460	UNK	4	O	●	O	Ø	Ø
TC3	430	520	840	460	UNK	4	O	II	O	Ø	Ø
TE4	415	510	850	460	4,00	4	O	=	Ø	Ø	Ø

CHAIR	RECICLABILITY		PACKAGING				DOCUMENTS		
ID	Recycled (%)	Recyclable (%)	Quantity	Weight (kg)	Dimensions	Disassembled	3D Model	2D Drawings	Patents
DC1	UNK	UNK	UNK	UNK	UNK	UNK	No	JPG	N/A
DC2	UNK	UNK	UNK	UNK	UNK	UNK	No	JPG	N/A
DC3	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
DC4	UNK	UNK	UNK	UNK	UNK	UNK	No	JPG	N/A
DC5	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
DE6	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
JC1/ICB22	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
JC2	UNK	32	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/JPG	N/A
JC3	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/JPG	N/A
JC4	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/JPG	N/A
JC5	UNK	UNK	UNK	UNK	UNK	UNK	No	JPG	N/A
JE6	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
ICA1/TC1	0,02	97,2	36	UNK	1m3	UNK	DWG/3DS	JPG	D22998, US1181357
ICA2	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS	JPG	US2136198, DE555024C
ICA3	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/JPG	N/A
ICA4	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/JPG	N/A
ICA5	1	2	1	9,1	33x24x22"	No	DWG/3DS/...	JPG	US2554490
ICA6	14	100	1	7,3	27x25x32"	No	DWG/3DS/...	JPG	N/A
ICA7	UNK	UNK	1	7,7	21x20x33"	No	DWG/3DS/...	JPG	US2697575, US2708476
ICA8	UNK	UNK	UNK	UNK	UNK	UNK	DWG/SKP/...	JPG	US2939517
ICA9	UNK	UNK	UNK	UNK	UNK	No	DWG/3DS/...	DWG/JPG	N/A
ICA10	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
ICA11	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
ICA12	UNK	UNK	2	9,4	0,245m3	UNK	No	JPG	N/A
ICA13	2	100	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG	US3086818
ICB14	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	PDF/AI	N/A
ICB15	UNK	100	1	8	60x60x99cm	No	No	PDF	N/A
ICB16	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
ICB17	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/AI/JPG	N/A
ICB18	23	100	1	13,1	32x26x35"	No	DWG/3DS/...	PDF	US3027195
ICB19	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG/PDF	N/A
ICB20	UNK	100	2	7	0,292m3	UNK	DXF/3DS	DXF	N/A
ICB21	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG	N/A
ICB23	100	UNK	UNK	UNK	UNK	UNK	No	No	N/A
ICB24	UNK	UNK	UNK	UNK	UNK	UNK	3DM	PDF	N/A
ICB25	68	99	2	12	28x22x35"	No	DWG/3DS/...	PDF	N/A
IPCB26	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
IE27	UNK	UNK	UNK	UNK	UNK	UNK	STL	PDF	N/A
IE28	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS/...	DWG	N/A
IE29	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
IE30	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A
IE31	UNK	UNK	2	10,5	0,246m3	UNK	No	JPG	N/A
IE32	0	100	4	21,1	20x27x35"	No	DWG/3DS/...	PDF	N/A
ISE1	UNK	UNK	UNK	UNK	UNK	UNK	DWG	DWG/JPG	US2042976 (process)
TC2	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS	JPG	D22022
TC3	UNK	UNK	UNK	UNK	UNK	UNK	DWG/3DS	JPG	N/A
TE4	UNK	UNK	UNK	UNK	UNK	UNK	No	No	N/A

CHAIR	RELATED PRODUCTS			
ID	**Variants/Family/Collection/Series/Line**	**Options (parts)**	**Options (finish, material)**	**Versions**
DC1	N/A	N/A	UNK	Habitat 70
DC2	N/A	N/A	UNK	N/A
DC3	N/A	N/A	UNK	Uniforma (prod.)
DC4	Armchair	N/A	UNK	N/A
DC5	N/A	N/A	UNK	N/A
DE6	Armchair, tables, ... (Habitat 70)	N/A	N/A	N/A
JC1/ICB22	Tables	Solid-back	N/A	N/A
JC2	N/A	N/A	Color	N/A
JC3	Chair (One&Two)	N/A	Material, Colour, Upholstered	N/A
JC4	Armchair, office chair, barstool, ...	N/A	Material, colour, pad	N/A
JC5	Armchair, stool, barstool, table	N/A	Material, colour	N/A
JE6	N/A	N/A	N/A	Yes
ICA1/TC1	Armchair, child-chair (discontinued)	Solid-back (215)	Material (214 M), colour	No. 14
ICA2	Armchair (S34)	N/A	Material (S33 N), Colour	W1
ICA3	Armchair, high-chair, table (discontinued)	N/A	Material, Colour	N/A
ICA4	N/A	N/A	N/A	N/A
ICA5	Lounge Chair (LCW, LCM)	Metal base (DCM)	Material, Colour, Upholstered	N/A
ICA6	Rocking chair (RAR), chair (DSX, …)	Wire (DAR), dowel leg base (DAW)	Material, Colour, Upholstered	Fibreglass armchair
ICA7	N/A	4-leg (DKX), dowel leg base (DKW)	Pads	N/A
ICA8	Armchair, stool, tables	Swivel base	Color	N/A
ICA9	N/A	N/A	Material, Colour	N/A
ICA10	Armchair	N/A	Colour	Polyprop
ICA11	N/A	N/A	Colour	N/A
ICA12	Barstool (by adjusting height)	N/A	Colour	In ABS
ICA13	N/A	N/A	Colour	Panton Classic (polyurethane)
ICB14	Dinning table	N/A	Material, Colour	N/A
ICB15	Bench	N/A	Colour	N/A
ICB16	N/A	V-shaped back legs	Colour	N/A
ICB17	N/A	4-Legged	Material, Colour	N/A
ICB18	Dinning table, desk	N/A	N/A	DAF
ICB19	N/A	N/A	Colour	N/A
ICB20	Armchair, child chair, stool	N/A	Colour	N/A
ICB21	N/A	N/A	Material, Colour	N/A
ICB23	Child chair, stool, table, …	N/A	N/A	N/A
ICB24	Armchair	N/A	Colour	N/A
ICB25	Stool, public seating, table	Concrete base, 4-star base	Colour, Cushion	N/A
IPCB26	Lounge chair, tables	N/A	Material, Colour	Portuguesa (prod. Adico)
IE27	N/A	N/A	Colour	N/A
IE28	Lounge chair, rocking chair, tables, ... (Easy Edges)	N/A	N/A	N/A
IE29	Chairs of different styles	N/A	Colour	N/A
IE30	Armchair	N/A	Colour	N/A
IE31	N/A	N/A	Colour	N/A
IE32	Armchair, folding chair, table	N/A	Colour	N/A
ISE1	Chair (68), tables	4-Legged (E60)	Finish, Color	Stool No. 60
TC2	N/A	Open-back (214)	Material, Color	No. 15
TC3	N/A	N/A	Material, Color	No. 18
TE4	Tables	N/A	Material, Color	N/A

CHAIR	DESIGN		
ID	Inspirations/influences	Goals	Styles
DC1	UNK	UNK	Daciano
DC2	UNK	UNK	Daciano
DC3	UNK	UNK	Daciano
DC4	UNK	UNK	Daciano
DC5	UNK	UNK	Daciano
DE6	UNK	UNK	Daciano
JC1/ICB22	UNK	Basic materials & tools, minimalism/simplicity	Morrison
JC2	UNK	UNK	Morrison
JC3	UNK	UNK	Morrison
JC4	Cork chair (Morrison), PK9 chair	Super normal' designs, multiple sitting positions	Morrison
JC5	UNK	UNK	Morrison
JE6	UNK	UNK	Morrison
ICA1/TC1	UNK	Material (experiments), low-cost, lightweight, durable, easily disassembled	Thonet
ICA2	UNK	Form (clear and simple)	UNK
ICA3	Sitzgeiststuhl chair (Rasch)	One-piece chair (failed), continuous form, oblique lines, abstraction	Modern, De Stijl
ICA4	UNK	Outdoor use, lightweight, stackable, ease of cleaning	UNK
ICA5	UNK	Material (experiments), seat shell (failed), comfort (no upholstery), low-cost	Mid-century Modern
ICA6	UNK	Material (experiments), organic shapes, low-cost, mix-and-match, playful	Mid-century Modern
ICA7	Diamond chair (Bertoia), Eiffel Tower	Mesh, mix-and-match, light/airy look	Mid-century Modern
ICA8	Tulip, wineglass	One-piece chair (failed), without legs, fluid organic form, futuristic-looking	Mid-century Modern
ICA9	Chiavari chair (Descalzi)	Lightweight, low-cost, large production volume	Italian Modern
ICA10	Eames fibreglass chairs	Multipurpose, low-cost, material (experiments), stackable, ease of cleaning	Mid-century Modern
ICA11	UNK	One-piece chair, stackable, lightweight, weatherproof	UNK
ICA12	Children's Chairs (Zanuso & Sapper)	One-piece chair (failed), modular, young market, forms (futuristic, playful)	Pop art
ICA13	S Chair (Panton), stacked plastic buck-ets	Cantilever, one-piece plastic chair, stackable, sexy, playful	Danish Modern, Pop art
ICB14	Chinese Ming Dynasty armchairs	Organic, simplicity, comfort	Danish Modern
ICB15	Atoms (balled feet)	Material (experiments - war wastes), sculptural & playful form, light	UNK
ICB16	Jean Arp's sculptures	One-piece Seat/Back/Legs, functional, simple, sculptural shape	UNK
ICB17	Organic Chair (Eames & Saarinen)	Seat shell, organic minimalist form, low-cost, lightweight	Danish Modern
ICB18	Eames chairs	Form (sculptural & organic), material (metal), easily disassembled	UNK
ICB19	Sand imprint of women’s behind, tulip	Ergonomy (experiments)	UNK
ICB20	UNK	Material and formal simplicity	UNK
ICB21	Panton chair, African craftwork	Proptotype experiments (do-it-yourself, try-it-and-see)	UNK
ICB23	Gerrit Rietveld's chairs	Recycled materials, simplicity of form, obvious design	UNK
ICB24	Nature	Technology & materials science, organic forms	UNK
ICB25	Soccer ball	Proptotype experiments, Material (minimization), void shape	UNK
IPCB26	UNK	For café terraces (Lisbon)	UNK
IE27	Landi chair, 40/4 Chair (Rowland)	Rational form, stackable, lightweight, mass production, low-cost	Pop art, High-Tech
IE28	Stack of corrugated cardboard	Everyday material, low-cost, ecology, form (sculptural)	UNK
IE29	Queen Anne style	Redesign, complexity, flattened silhouette	Postmodernism
IE30	Dr. Glob (Starck)	Low-cost, contrast (materials & shape), satire, playful, anthropomorphic	Postmodernism
IE31	UNK	Optimism, retro, flowing curves	UNK
IE32	UNK	Lightweight, low-cost, stackable, comfort, form (clean)	UNK
ISE1	Tubular-metal designs	Material (traditional Finnish), form (simplicity)	Scandinavian Modern
TC2	UNK	UNK	Thonet
TC3	UNK	UNK	Thonet
TE4	No. 14, 214 (Thonet)	Redesign, aesthetics	Thonet

CHAIR	LOCATION		SAMPLING		
ID	Museums	Private Collections	Criteria	Source	Image Source
DC1	N/A	Residence of Ana Costa	Daciano wooden frame chair	[1]	Author's photo, 2016
DC2	N/A	Atelier Daciano da Costa	Daciano wooden frame chair	[1]	Author's photo, 2016
DC3	UNK	Residence of Ana Costa	Daciano wooden frame chair	[1]	Author's photo, 2016
DC4	N/A	Unknown	Daciano wooden frame chair	[1]	Martins, 2016
DC5	N/A	Atelier Daciano da Costa	Daciano wooden frame chair	[1]	Martins, 2016
DE6	N/A	Atelier Daciano da Costa	Daciano wooden frame chair	[1]	Author's photo, 2016
JC1/ICB22	DM, VDM, V&A	N/A	Morrison wooden frame chair; open-back chair	[2, 3, 4]	Morrison, 2017
JC2	N/A	N/A	Morrison wooden frame chair	[2]	Vitra, 2016
JC3	N/A	N/A	Morrison wooden frame chair	[2]	Cappellini, 2016
JC4	N/A	N/A	Morrison wooden frame chair	[2]	Vitra, 2016
JC5	N/A	N/A	Morrison wooden frame chair	[2]	Maruni, 2016
JE6	N/A	N/A	Morrison wooden frame chair	[2]	Hubert Weinzierl, 2016
ICA1/TC1	DM, VDM, V&A, MoMA	N/A	1st Bentwood frame; Corpus of Thonet Grammar	[3, 4, 6, 8]	Thonet GmbH, 2016
ICA2	V&A	N/A	1st Cantilever chair	[3, 5, 6]	Thonet GmbH, 2016
ICA3	DM, VDM, V&A, MoMA	N/A	2nd Wood cantilever chair	[3, 4, 5, 6]	Cassina, 2016
ICA4	DM, VDM, MoMA	N/A	1st Shell in hard material	[3, 4, 6]	Vitra, 2016
ICA5	DM, VDM, V&A, MoMA	N/A	Moulded plywood in compound curves	[3, 4, 5, 6]	Herman Miller, 2016
ICA6	VDM, MoMA	N/A	1st Shell in fibreglass-reinforced plastic	[4]	Herman Miller, 2016
ICA7	VDM, V&A	N/A	1st Shell in wire mesh	[3, 4, 6]	Herman Miller, 2016
ICA8	DM, VDM, V&A, MoMA	N/A	1st "Wineglass" pedestal base	[3, 4, 5, 6]	Knoll, 2016
ICA9	DM, VDM, V&A, MoMA	N/A	Super-lightweight chair	[3, 4, 5, 6]	Cassina, 2016
ICA10	DM, V&A	N/A	1st Polypropylene shell	[3, 5, 6]	Hille, 2016
ICA11	VDM, V&A	N/A	1st One-piece mass-produced plastic chair	[4, 6]	V&A, 2016
ICA12	DM, V&A, MoMA	N/A	1st Adult-sized injection-moulded chair	[3, 6]	Kartell, 2014
ICA13	DM, VDM, V&A, MoMA	N/A	1st One-piece cantilever chair	[3, 4, 5, 6]	Vitra, 2016
ICB14	N/A	N/A	Spindle back	[5, 6]	Carl Hansen & Søn, 2016
ICB15	DM, V&A	N/A	Parallel stretcher	[3, 5, 6]	Race Furniture, 2016
ICB16	VDM	N/A	U-shaped stretcher	[4]	VDM, 2013
ICB17	DM, VDM, MoMA	N/A	3-Legged chair	[4, 5, 6]	Fritz Hansen, 2016
ICB18	V&A	N/A	Pedestal 4-star base	[5, 6]	Herman Miller, 2016
ICB19	N/A	N/A	Pedestal 3-star base	[5]	Fritz Hansen, 2016
ICB20	MoMA	N/A	H-shaped stretcher	[6]	Alias, 2016
ICB21	DM, V&A, MoMA	N/A	Cantilever with round base	[3, 5, 6]	Cappellini, 2016
ICB23	V&A	N/A	Double 4-legged chair	[6]	V&A, 2016
ICB24	MoMA	N/A	Reverse cantilever chair	[6]	MoMA, 2016
ICB25	DM, V&A	N/A	X-shaped back chair	[3]	Herman Miller, 2016
IPCB26	MUDE	N/A	Semicircular seat	[7]	Arcalo, 2016
IE27	DM, V&A	N/A	Six chairs of Design Museum (2009)	[3, 6]	OMK Design, 2016
IE28	DM, VDM	N/A	Six chairs of Design Museum (2009)	[3, 4, 6]	Vitra, 2016
IE29	VDM, MoMA	N/A	Six chairs of Design Museum (2009)	[4, 6]	MoMA, 2016
IE30	DM, VDM, MoMA	N/A	Six chairs of Design Museum (2009)	[3, 4, 5]	DM, 2016
IE31	MoMA	N/A	Six chairs of Design Museum (2009)	[3]	MoMA, 2016
IE32	DM	N/A	Six chairs of Design Museum (2009)	[3]	Herman Miller, 2016
ISE1	DM, V&A, MoMA	N/A	Stool of Design Museum (2009)	[3, 5, 6]	Artek, 2016
TC2	N/A	N/A	Corpus of Thonet Grammar	[8]	Thonet GmbH, 2016
TC3	N/A	N/A	Corpus of Thonet Grammar	[8]	Thonet GmbH, 2016
TE4	N/A	N/A	Redesign of the chair Thonet 214	[8]	Muji, 2016

Legend: Selection criteria

Image credits:

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Appendix 3.B.2 Sample Plates

D Daciano

DC1 Alvor-Grill

DC2 Alvor-Coffeeshop

DC3 Palace

DC4 Penta-Restaurant

DC5 Tripeça

DE6 Costureira

J Jasper

JC1/ICB22 Ply

JC2 Basel

JC3 Bac

JC4 HAL

JC5 Lightwood

JE6 La Tourette

I Iconic

ICA1/TC1 214

ICA2 S33

ICA3 Zig-Zag

ICA4 Landi

ICA5 DCW

ICA6 DAX

ICA7 DKR

ICA8 Tulip

ICA9 Superleggera

ICA10 Polyside

ICA11 Bofinger

ICA12 Universale

ICA13 Panton

ICB14 Wishbone

ICB15 Antelope

ICB16 Bellevue

ICB17 Ant

ICB18 Swag Leg

ICB19 PK9

ICB20 Spaghetti

ICB21 S

ICB23 RCP2

ICB24 Magic

ICB25 Chair_One

IPCB26 Gonçalo

I Iconic

IE27 Omkstack

IE28 Wiggle

IE29 Queen Anne

IE30 Louis 20

IE31 FPE

IE32 Air-Chair

ISE1 Stool 60

T Thonet

TC2 215

TC3 218

TE4 Muji No. 14

Multipurpose Chair Ontology

Appendixes

4

4 MULTIPURPOSE CHAIR ONTOLOGY: APPENDIXES

Appendix 4.A Meta-Ontology

Appendix 4.A.1 Parts (table)

NAME	CODE	ID	DESCRIPTION
Part	**N/A**	**N/A**	**Part of an object which plays a particular function and location within the whole**
Guides	**guides**	**g**	**Auxiliary boundary of a part, that guide the subparts positioning**
Frame	**N/A**	**N/A**	**Linear structural elements that supports seat and back above the ground**
Inclined plane	**N/A**	**N/A**	**N/A**
Outer Frame	**outer**	**o**	**The outermost rails**
Front Rail	front	f	The frontmost rail
Back Rail	back	b	The rearmost rail (also called Rear)
Side Rail	side	s	The sidemost rail
Inner Frame	**inner**	**i**	**The innermost rails**
Cross Rail	cross	c	Rail positioned from side to side (also called Medial or Centre)
Long Rail	long	l	Rail positioned from front to back (US 20040177440)
Radial Rail	radial	r	Rails positioned towards the centre. Include: Diagonal rail: for 4-legs, connecting the diametrically opposed legs (also called X or Cross) Centre rail: for 3-legs, connecting the legs with the circumcenter Star: for 1-leg, connecting the leg in the centre
Vertical plane	**N/A**	**N/A**	**N/A**
Outer Frame	**outer**	**o**	**The outermost rails**
Top Rail	top	t	The uppermost horizontal rail (also called Upper rail)
Bottom Rail	bottom	b	The lowermost horizontal rail (also called Lower rail)
Upright	upright	u	The sidemost vertical rail (also called Stile)
Inner Frame	**inner**	**i**	**The innermost rails**
Splat	splat	s	Vertical slat positioned from top to bottom (also called Inner Upright)
Cross Rail	cross	c	Horizontal rail positioned from side to side (also called Mid rail)
Radial Rail	radial	r	Rails positioned towards the centre (also called Cross Slat)
Profile plane	**N/A**	**N/A**	**N/A**
Outer Frame	**outer**	**o**	**The outermost rails**
Top	top	t	The uppermost horizontal rail
Front	front	f	Vertical slat positioned forward at the top
Back	back	b	Vertical slat positioned backward at the top (also called Rear)
Inner Frame	**inner**	**i**	**The innermost rails**
Side	**side**	**s**	Vertical slat positioned inward at the top
Panels	**panel**	**p**	**Planar nonstructural elements (also called Support) - (US 2554490)**

NAME	APPLICATION	TOTAL
Part	**Legs, Seat, Back, Stretchers, Base, Arms**	**N/A**
Guides	**Guides, Legs, Seat, Back, Stretchers, Base, Arms**	**7**
Frame	**Legs, Seat, Back, Stretchers, Base, Arms**	**N/A**
Inclined plane	**Seat, Stretchers, Base**	**N/A**
Outer Frame	**Seat Outer Frame, Stretchers Outer Frame, Base Outer Frame**	**N/A**
Front Rail	Seat Front Rail, Front Stretcher, Base Front Rail	3
Back Rail	Seat Back Rail, Back Stretcher, Base Back Rail	3
Side Rail	Seat Side Rail, Side Stretcher, Base Side Rail	3
Inner Frame	**Seat Inner Frame, Stretchers Inner Frame, Base Inner Frame**	**N/A**
Cross Rail	Seat Cross Rail, Cross Stretcher, Base Cross Rail	3
Long Rail	Seat Long Rail, Long Stretcher, Base Long Rail	3
Radial Rail	Seat Radial Rail, Radial Stretcher, Base Radial Rail	3
Vertical plane	**Back**	**N/A**
Outer Frame	**Back Outer Frame**	**N/A**
Top Rail	Back Top Rail	1
Bottom Rail	Back Bottom Rail	1
Upright	Back Upright	1
Inner Frame	**Back Inner Frame**	**N/A**
Splat	Back Splat	1
Cross Rail	Back Cross Rail	1
Radial Rail	Back Radial Rail	1
Profile plane	**Legs, Arms**	**N/A**
Outer Frame	**Arms Outer Frame**	**N/A**
Top	Armrest	1
Front	Front Leg, Arm Front support	2
Back	Back Leg, Arm Back support	2
Inner Frame	**Arms Inner Frame**	**N/A**
Side	Arm Side support	1
Panels	**Legs (Front, Back, Side, Radial), Seat, Back, Stretchers, Base, Arms**	**9**
	TOTAL	46

Appendix 4.A.2 Geometry (table)

NAME	CODE	ID	DESCRIPTION
Overall Dimensions	**N/A**	**N/A**	**Linear measure of an entity in one direction (also called Size)**
Width	width	w	Dimension from side to side, or across (in the x-axis)
Depth	depth	d	Dimension from front to back (roughly in the y-axis)
Height	height	h	Dimension from bottom to top (roughly in the z-axis)
Thickness	thickness	t	Dimension between the two opposite largest surfaces through a solid entity
Spacing Dimensions	**Δ**	**Δ**	**Spatial location of an entity, in relation to a referential**
Width Spacing	Δwidth	Δw	Position of an entity along the width direction
Width Front Spacing	Δwidth-front	Δwf	Position of an entity along the width direction, at the front
Width Rear Spacing	Δwidth-rear	Δwr	Position of an entity along the width direction, at the rear
Width Top Spacing	Δwidth-top	Δwt	Position of an entity along the width direction, at the top
Width Bottom Spacing	Δwidth-bottom	Δwb	Position of an entity along the width direction, at the bottom
Depth Spacing	Δdepth	Δd	Position of an entity along the depth direction
Depth Rear Spacing	Δdepth-rear	Δdr	Position of an entity along the depth direction, at the rear
Depth Top Spacing	Δdepth-top	Δdt	Position of an entity along the depth direction, at the top
Depth Bottom Spacing	Δdepth-bottom	Δdb	Position of an entity along the depth direction, at the bottom
Height Spacing	Δheight	Δh	Position of na entity along the height direction
Taper	**Δtaper**	**Δ**	**Form than becomes thinner toward one end**
Taper Ratio	Δtaper	Δt	Difference between the starting and ending face (in a truncated cone)
Taper Width	Δtaper-width	Δtw	Difference between the starting and ending width (in a trapezoid shape)
Section Dimensions	**section**	**s**	**Cross section dimension**
Section Diameter	sround-diameter	srd	Curvature diameter (of a round section)
Section Width	ssquare-width	ssw	Dimension from side to side (of a square section)
Section Depth	ssquare-depth	ssd	Dimension from front to back (of a square section)
Section Height	ssquare-height	ssh	Dimension from bottom to top (of a square section)
Radius	**radius**	**r**	**Measure of the curvature radius (of a rounded polygon corner)**
Front Radius	radius-front	rf	Radius of the front edge corner (roughly in the XY-plane)
Rear Radius	radius-rear	rr	Radius of the rear edge corner (roughly in the XY-plane)
Top Radius	radius-top	rt	Radius of the top edge corner (roughly in the XZ-plane)
Bottom Radius	radius-bottom	rb	Radius of the top bottom corner (roughly in the XZ-plane)
Angles	**angle**	**α**	**Angular measure between two lines or planes**
Angle	angle	α	Angle between two entities (in this case, planes)
Tilt Angle	angle-tilt	αt	Angle from the horizontal, in the side view (Pheasant [1986] 2003)
Splay Angle	angle-splay	αs	Angle from the vertical, in the front view
Rake Angle	angle-rake	αr	Angle from the vertical, in the side view
Number	**number**	**n**	**Number of elements**
Section Shape	**s**	**s**	**Shape of the section (round or square)**
Mode	**mode**	**m**	**Visualization mode (wireframe skeleton or solid)**

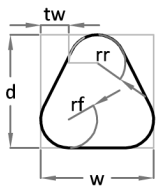
NAME	APPLICATION	TOTAL
Overall Dimensions	**N/A**	**N/A**
Width	Seat, Back, Base	3
Depth	Seat, Base, Arms	3
Height	Seat, Back, Stretchers, Arms, Back Upright, Back Cross Rail, Front & Back Stretcher	8
Thickness	Panels of Legs, Seat, Back, Stretchers, Base, Arms	6
Spacing Dimensions	**N/A**	**N/A**
Width Spacing	Front Leg, Back Leg	2
Width Front Spacing	Seat Long Rail, Long Stretcher, Base Long Rail	3
Width Rear Spacing	Seat Long Rail, Long Stretcher, Base Long Rail	3
Width Top Spacing	Back Splat	1
Width Bottom Spacing	Back Splat	1
Depth Spacing	Front Leg, Back Leg, Seat Cross Rail, Cross Stretcher, Base Cross Rail	5
Depth Rear Spacing	Arms	1
Depth Top Spacing	Arm Side Support	1
Depth Bottom Spacing	Arm Side Support	1
Height Spacing	Back	1
Taper	**N/A**	**N/A**
Taper Ratio	Front Leg, Back Leg	2
Taper Width	Seat, Back	2
Section Dimensions	**N/A**	**N/A**
Section Diameter	Front Leg, Back Leg, Outer/Inner frame of Seat, Back, Stretchers, Base, Arms	12
Section Width	Front Leg, Back Leg, Outer/Inner frame of Seat, Back, Stretchers, Base, Arms	12
Section Depth	Front Leg, Back Leg, Outer/Inner frame of Back, Inner Frame of Arms	5
Section Height	Outer/Inner frame of Seat, Stretchers, Base, Outer Frame of Arms	7
Radius	**N/A**	**N/A**
Front Radius	Seat, Stretchers, Base, Arms	4
Rear Radius	Seat, Stretchers, Base, Arms	4
Top Radius	Back	1
Bottom Radius	Back	1
Angles	**N/A**	**N/A**
Angle	Back-Seat Angle	1
Tilt Angle	Seat, Stretchers, Arms	3
Splay Angle	Front Leg, Back Leg	2
Rake Angle	Front Leg, Back Leg	2
Number	**Cross & Long Rail of Seat & Back, Radial Rail of Seat & Base**	**6**
Section Shape	**Front Leg, Back Leg, Outer/Inner frame of Seat, Back, Stretchers, Base, Arms**	**12**
Mode	**Overall**	**1**
	TOTAL	**116**

Appendix 4.A.3 Types (table)

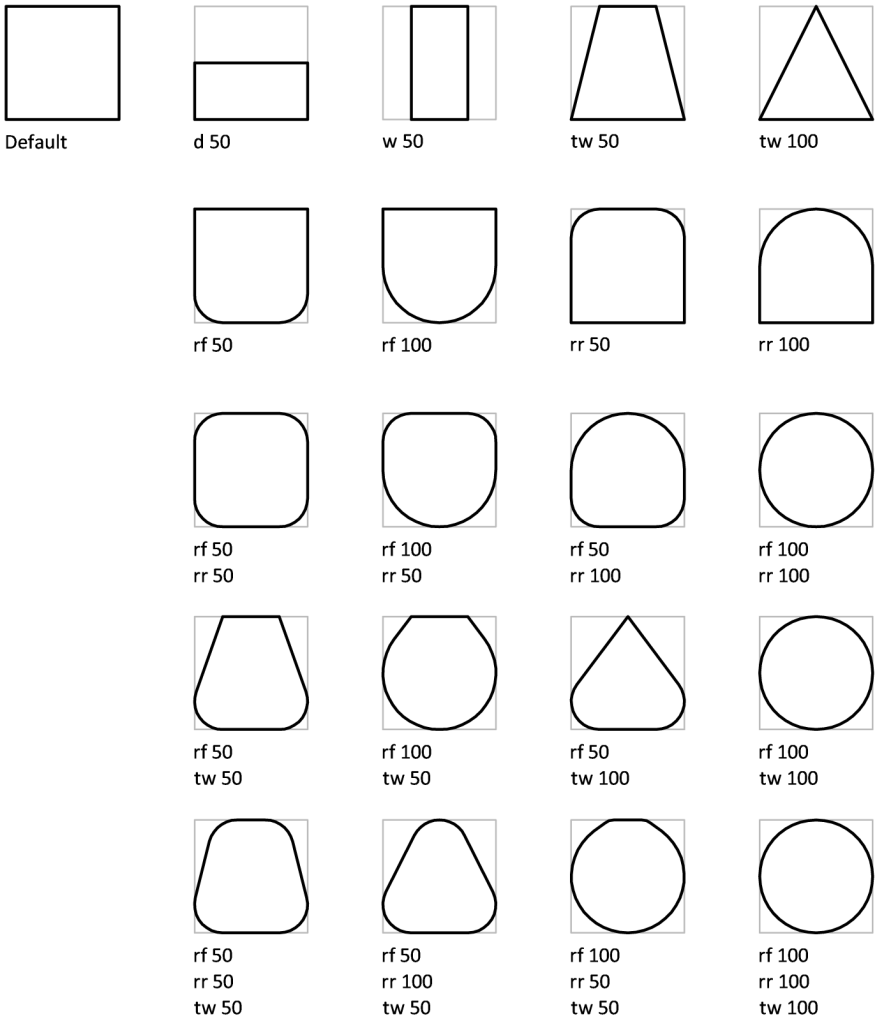
NAME	ID	DESCRIPTION	APPLICATION	TOTAL
Number	**N/A**	**Number of elements**	**N/A**	**N/A**
None	Ø	No elements	Stretchers, Base, Arms	3
One/Single	1	One single element	[Legs], Seat, Back, Stretchers, Base	4
Two	2	Two elements	[Legs], Arms	1
Three	3	Three elements	[Legs]	0
Four	4	Four elements	Legs	1
Doubles	+	Duplicated elements	Legs (4, X-shape)	2
Outer Shape	**N/A**	**Shape of the boundary of a part**	**N/A**	**N/A**
Square	□	Square shaped	Legs (section), Seat, Back, Stretchers, Base, Arms	6
Circular	O	Circular shaped (also called Round)	Legs (section), Seat, Back, Stretchers, Base, Arms	6
Semicircular	Φ	Semicircular shaped (also called Half-round)	Seat, Back, Stretchers, Base, Arms	5
Trapezoid/Taper	Δ	Trapezoid or tapered shaped	Legs (section), Seat, Back, Stretchers, Base, Arms	6
Shape	**N/A**	**Shape of the subparts (including inner shape)**	**N/A**	**N/A**
Parallel	II	Parallel elements, positioned in the depth direction	Legs (X-shape, Solid), Seat, Back, Stretchers, Base	6
Parallel (reverse)	=	Parallel elements, positioned in the width direction	Legs (X-shape, Solid), Seat, Back, Stretchers, Base	6
Mesh	#	Mesh-shaped elements (also called Lattice)	Seat, Back	2
X-shaped	X	X-shaped elements (also called Cross or 4-Star)	Legs (X-shape, Solid), Seat, Back, Stretchers, Base	6
H-shaped	H	H-shaped elements	Seat, Stretchers, Base	3
H-shaped (reverse)	HR	H-shaped elements, rotated 90 degrees	Seat, Stretchers, Base	3
U-shaped	U	U-shaped elements	Seat, Stretchers, Base	3
U-shaped (reverse)	UR	Inverted U-shaped elements	Legs (Solid), Seat, Stretchers, Base	4
3-Star	*3	Three-pointed star shaped elements	Seat, Base	2
5-Star	*5	Five-pointed star shaped elements	Seat, Base	2
Box/Open	O	Box-shaped elements (without inner elements)	Legs (Solid), Seat, Back, Stretchers, Base	5
Solid	●	Solid panelled element (also called Panelled)	Legs (Solid), Seat, Back, Stretchers, Base, Arms	6
Angle	**N/A**	**Angle of an element**	**N/A**	**N/A**
Outward	O	Element angled towards the outside	Legs (Angled)	1
Inward	I	Element angled towards the inside	Legs (Angled)	1
Raked	R	Element with a rake angle	Legs (Angled *2)	2
Splayed	S	Element with a splay angle	Legs (Angled *2)	2
Position	**N/A**	**Position of an element**	**N/A**	**N/A**
Front	F	Positioned in the front plane	Legs (1, 2*2, 3)	4
Back	B	Positioned in the back plane	Legs (1, 2, 3)	3
Centre	C	Positioned in the centre	Legs (1, X-shape)	2
Dimension	**N/A**	**Dimension of an element**	**N/A**	**N/A**
Small	S	Smaller size	Back	1
Medium	M	Intermediate size	Back	1
Large	L	Larger size	Back	1
			TOTAL	100

Appendix 4.A.4 Geometry (schema)

Parameter	ID	Unit	Range	Default
Width	w	%	[1,100]	100
Depth	d	%	[1,100]	100
Front Radius	rf	%	[0,100]	0
Rear Radius	rr	%	[0,100]	0
Taper Width	tw	%	[0,100]	0

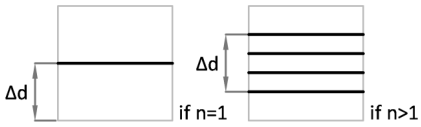


Outer Frame parameters



Parameter	ID	Unit	Range	Def.
Depth Spacing	Δd	%	[1,99]	50
Number	n	N/A	[1,12]	1

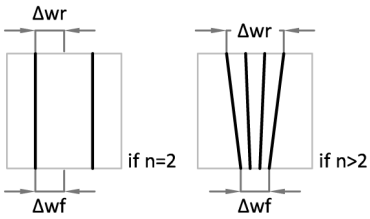
Cross Rail parameters



Default | Δd 75 | n 4 | Δd 75 n 4 | Δd 75 n 9

Parameter	ID	Unit	Range	Def.
Width Front Spacing	Δwf	%	[0,100]	50
Width Rear Spacing	Δwr	%	[0,100]	50
Number	n	N/A	[2,12]	2

Long Rail parameters

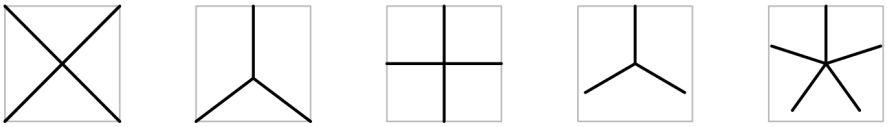


Default | Δwf 25 | Δwr 25 | Δwf 25 n 4 | Δwf 75 Δwf 100 n 9

Parameter	ID	Unit	Range	Def.
Number	n	N/A	[3,5]	4

Radial Rail parameters

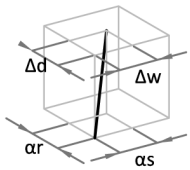
Diagonal (4 legs) | Centre (3 legs) | Star (1 leg)

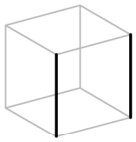


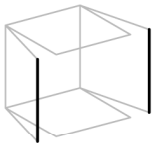
N/A | N/A | Default | n 3 | n 5

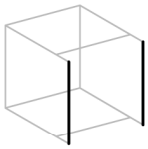
Parameter	ID	Unit	Range	Def.
Width Spacing	Δw	%	[-100,100]	0
Depth Spacing	Δd	%	[-100,100]	0
Splay Angle	αs	%	[-100,100]	0
Rake Angle	αr	%	[-100,100]	0

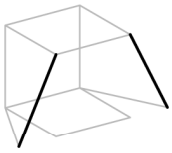
Leg parameters

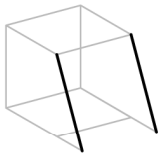



Default

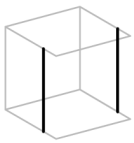

Δw 50


Δd 50

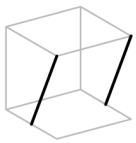

αs 50


αr 50

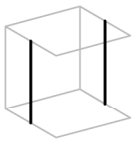

Δw -50


Δd -50

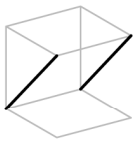

αs -50

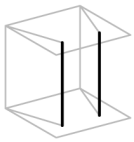

αr -50

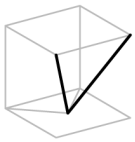

Δw -100


Δd -100


αs -100


αr -100


Δw -50
Δd -50


αs -50
αr -50


Δw -50
αs -50


Δw -50
αs 50


Δw -100
Δd -100


αs -100
αr -100


Δw -100
αs -100


Δw -100
αs 100


Δw -100
Δd -100
αs 100

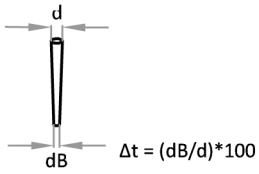

Δw -100
Δd -100
αr 100

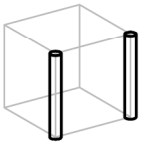

Δw -100
Δd -100
αs 100
αr 100

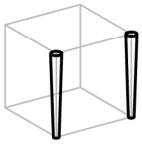

Δw -100
Δd -100
αs -100
αr -100

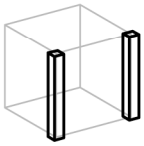
Parameter	ID	Unit	Range	Default
Diameter	d	mm	[1,280]	30
Width/depth	w/d	mm	[1,280]	30
Taper Ratio	Δt	%	[1,100]	100
Round/square Section	s	N/A	{r,s}	r

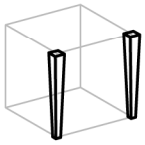
Solid Frame parameters

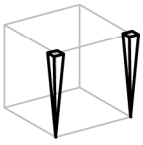



Default


Δt 50

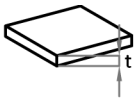

s Square


Δt 50
s Square

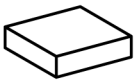

Δt 1
s Square

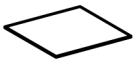
Parameter	ID	Unit	Range	Default
Thickness	t	mm	[1,100]	10

Solid Panels parameters



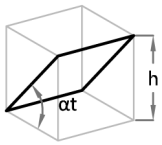

Default

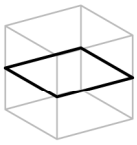

t 20


t 1

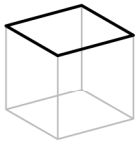
Parameter	ID	Unit	Range	Default
Height	h	%	[0,100]	50
Tilt Angle	αt	%	[-100,100]	0

Inclined plane parameters

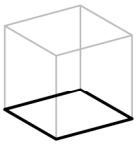




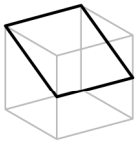
Default



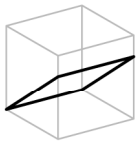
h 100



h 0



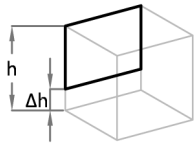
αt 100

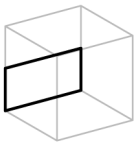


h 75
αt -100

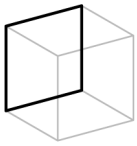
Parameter	ID	Unit	Range	Default
Height	h	%	[1,100]	50
Height Spacing	Δh	%	[0,99]	0

Vertical plane parameters

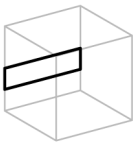




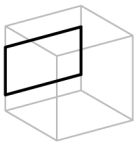
Default



h 100



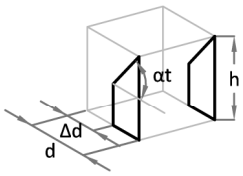
Δh 50

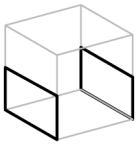


h 75
Δh 25

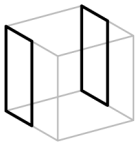
Parameter	ID	Unit	Range	Default
Height	h	%	[1,100]	50
Depth	d	%	[1,100]	100
Depth Spacing	Δd	%	[0,99]	0
Tilt Angle	αt	%	[-100,100]	0

Profile plane parameters

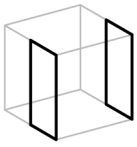




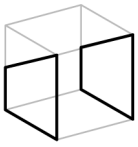
Default



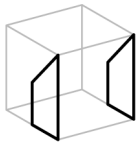
d 50



Δd 50

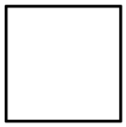
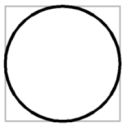
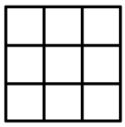
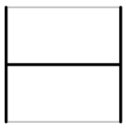
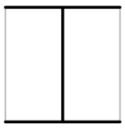
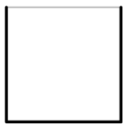
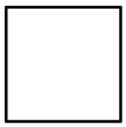
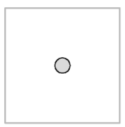
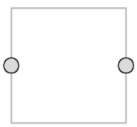
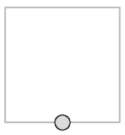
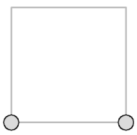
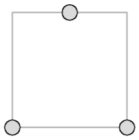
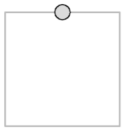
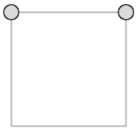
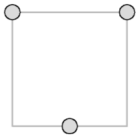
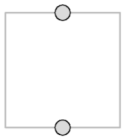
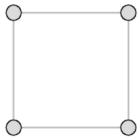


αt 50



Δd 50
αt 50

Appendix 4.A.5 Types (schema)

OUTER SHAPE	 □ (Square)	 O (Circular)	 Φ (Semicircular)	 Δ (Trapezoid)		
SHAPE	 Ø (None)	 1 (Single)	 II (Parallel)	 = (Parallel Rev.)	 # (Mesh)	 X (X-Shaped)
	 H (H-Shaped)	 HR (H-Shaped Rev.)	 U (U-Shaped)	 UR (U-Shaped Rev.)	 3* (3-Star)	 5* (5-Star)
	 O (Box)	 ● (Solid)				
NUMBER/POSITION	 1C (Centre)	 2S (Side)				
	 1F (Front)	 2F (Front)	 3F (Front)			
	 1B (Back)	 2B (Back)	 3B (Back)			
		 2FB (Front/Back)		 4 (Front/Back)		

Appendix 4.B Multipurpose Chair Ontology

Appendix 4.B.1 Parts/Geometry/Generation (table)

NAME	TYPE	MIN	MAX	DEFAULT	CODE NAME	ID
Display	**Tab**	**N/A**	**N/A**	**N/A**	**display**	**N/A**
Guides	**Checkbox**	**False**	**True**	**True**	**guides**	**g**
Mode	**Radiobox**	**Wireframe**	**Solid**	**Wireframe**	**mode-solid**	**ms**
Legs	**Tab**	**N/A**	**N/A**	**N/A**	**leg**	**l**
Legs Guides	**Checkbox**	**False**	**True**	**True**	**leg-guides**	**lg**
Front Leg	**Checkbox**	**False**	**True**	**False**	**leg-front**	**lf**
Width Spacing (%)	Slider	-100	100	0	leg-front-Δwidth	lf-Δw
Depth Spacing (%)	Slider	-100	100	0	leg-front-Δdepth	lf-Δd
Splay Angle (%)	Slider	-100	100	0	leg-front-angle-splay	lf-αs
Rake Angle (%)	Slider	-100	100	0	leg-front-angle-rake	lf-αr
Section	**Radiobox**	**Round**	**Square**	**Round**	**leg-front-sround**	**lf-sr**
Diameter (mm)	Slider	1	280	30	leg-front-sround-diameter	lf-srd
Width (mm)	Slider	1	280	30	leg-front-ssquare-width	lf-ssw
Depth (mm)	Slider	1	280	30	leg-front-ssquare-depth	lf-ssd
Taper Ratio (%)	Slider	1	100	100	leg-front-Δtaper	lf-Δt
Back Leg	**Checkbox**	**False**	**True**	**False**	**leg-back**	**lb**
Width Spacing (%)	Slider	-100	100	0	leg-back-Δwidth	lb-Δw
Depth Spacing (%)	Slider	-100	100	0	leg-back-Δdepth	lb-Δd
Splay Angle (%)	Slider	-100	100	0	leg-back-angle-splay	lb-αs
Rake Angle (%)	Slider	-100	100	0	leg-back-angle-rake	lb-αr
Section	**Radiobox**	**Round**	**Square**	**Round**	**leg-back-sround**	**lb-sr**
Diameter (mm)	Slider	1	280	30	leg-back-sround-diameter	lb-srd
Width (mm)	Slider	1	280	30	leg-back-ssquare-width	lb-ssw
Depth (mm)	Slider	1	280	30	leg-back-ssquare-depth	lb-ssd
Taper Ratio (%)	Slider	1	100	100	leg-back-Δtaper	lb-Δt
Leg Panels	**Message**	**N/A**	**N/A**	**N/A**	**leg-panel**	**lp**
Front Panel	**Checkbox**	**False**	**True**	**False**	**leg-panel-front**	**lpf**
Back Panel	**Checkbox**	**False**	**True**	**False**	**leg-panel-back**	**lpb**
Side Panel	**Checkbox**	**False**	**True**	**False**	**leg-panel-side**	**lps**
Radial Panel	**Checkbox**	**False**	**True**	**False**	**leg-panel-radial**	**lpr**
Thickness (mm)	Slider	1	100	10	leg-panel-thickness	lp-t
Seat	**Tab**	**N/A**	**N/A**	**N/A**	**seat**	**s**
Seat Guides	**Checkbox**	**False**	**True**	**True**	**seat-guides**	**sg**
Width (mm)	Slider	406	560	483	seat-guides-width	sg-w
Depth (mm)	Slider	406	508	457	seat-guides-depth	sg-d
Height (mm)	Slider	368	480	424	seat-guides-height	sg-h
Tilt Angle (°)	Slider	0	5	0	seat-guides-angle-tilt	sg-αt
Front Radius (%)	Slider	0	100	0	seat-guides-radius-front	sg-rf
Rear Radius (%)	Slider	0	100	0	seat-guides-radius-rear	sg-rr
Taper Width (%)	Slider	0	100	0	seat-guides-Δtaper-width	sg-Δtw
Seat Outer Frame	**Message**	**N/A**	**N/A**	**N/A**	**seat-outer**	**so**
Seat Front Rail	**Checkbox**	**False**	**True**	**False**	**seat-front**	**sf**
Seat Back Rail	**Checkbox**	**False**	**True**	**False**	**seat-back**	**sb**
Seat Side Rail	**Checkbox**	**False**	**True**	**False**	**seat-side**	**ss**
Outer Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**seat-outer-sround**	**so-sr**
Diameter (mm)	Slider	1	280	30	seat-outer-sround-diameter	so-srd
Width/Depth (mm)	Slider	1	280	30	seat-outer-ssquare-width	so-ssw

Height (mm)	Slider	1	280	30	seat-outer-ssquare-height	so-ssh
Seat Inner Frame	**Message**	**N/A**	**N/A**	**N/A**	**seat-inner**	**si**
Seat Cross Rail	**Checkbox**	**False**	**True**	**False**	**seat-cross**	**sc**
Depth Spacing (%)	Slider	1	99	50	seat-cross-Δdepth	sc-Δd
Number	Slider	1	12	1	seat-cross-number	sc-n
Seat Long Rail	**Checkbox**	**False**	**True**	**False**	**seat-long**	**sl**
Width Front Spacing (%)	Slider	0	100	50	seat-long-Δwidth-front	sl-Δwf
Width Rear Spacing (%)	Slider	0	100	50	seat-long-Δwidth-rear	sl-Δwr
Number	Slider	2	12	2	seat-long-number	sl-n
Seat Radial Rail	**Checkbox**	**False**	**True**	**False**	**seat-radial**	**sr**
Number	Slider	3	5	4	seat-radial-number	sr-n
Inner Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**seat-inner-sround**	**si-sr**
Diameter (mm)	Slider	1	280	30	seat-inner-sround-diameter	si-srd
Width/Depth (mm)	Slider	1	280	30	seat-inner-ssquare-width	si-ssw
Height (mm)	Slider	1	280	30	seat-inner-ssquare-height	si-ssh
Seat Panel	**Checkbox**	**False**	**True**	**False**	**seat-panel**	**sp**
Thickness (mm)	Slider	1	100	10	seat-panel-thickness	sp-t
Back	**Tab**	**N/A**	**N/A**	**N/A**	**back**	**b**
Back Guides	**Checkbox**	**False**	**True**	**True**	back-guides	**bg**
Height (mm)	Slider	330	635	483	back-guides-height	bg-h
Height Spacing (mm)	Slider	0	200	0	back-guides-Δheight	bg-Δh
Back-Seat Angle (°)	Slider	90	105	90	back-guides-angle	bg-α
Top Radius (%)	Slider	0	100	0	back-guides-radius-top	bg-rt
Bottom Radius (%)	Slider	0	100	0	back-guides-radius-bottom	bg-rb
Width (%)	Slider	0	100	50	back-guides-width	bg-w
Taper Width (%)	Slider	-100	100	0	back-guides-Δtaper-width	bg-Δtw
Back Outer Frame	**Message**	**N/A**	**N/A**	**N/A**	**back-outer**	**bo**
Back Upright	**Checkbox**	**False**	**True**	**False**	**back-upright**	**bu**
Height (%)	Slider	1	100	100	back-upright-height	bu-h
Back Top Rail	**Checkbox**	**False**	**True**	**False**	**back-top**	**bt**
Back Bottom Rail	**Checkbox**	**False**	**True**	**False**	**back-bottom**	**bb**
Outer Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**back-outer-sround**	**bo-sr**
Diameter (mm)	Slider	1	280	30	back-outer-sround-diameter	bo-srd
Width/Height (mm)	Slider	1	280	30	back-outer-ssquare-width	bo-ssw
Depth (mm)	Slider	1	280	30	back-outer-ssquare-depth	bo-ssd
Back Inner Frame	**Message**	**N/A**	**N/A**	**N/A**	**back-inner**	**bi**
Back Cross Rail	**Checkbox**	**False**	**True**	**False**	**back-cross**	**bc**
Height (%)	Slider	1	99	50	back-cross-top-height	bc-h
Number	Slider	1	12	1	back-cross-number	bc-n
Back Splat	**Checkbox**	**False**	**True**	**False**	**back-splat**	**bs**
Width Top Spacing (%)	Slider	0	100	50	back-splat-Δwidth-top	bs-Δwt
Width Bottom Spacing (%)	Slider	0	100	50	back-splat-Δwidth-bottom	bs-Δwb
Number	Slider	2	12	2	back-splat-number	bs-n
Back Radial Rail	**Checkbox**	**False**	**True**	**False**	**back-radial**	**br**
Inner Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**back-inner-sround**	**bi-sr**
Diameter (mm)	Slider	1	280	30	back-inner-sround-diameter	bi-srd
Width/Height (mm)	Slider	1	280	30	back-inner-ssquare-width	bi-ssw
Depth (mm)	Slider	1	280	30	back-inner-ssquare-depth	bi-ssd
Back Panel	**Checkbox**	**False**	**True**	**False**	**back-panel**	**bp**
Thickness (mm)	Slider	1	100	10	back-panel-thickness	bp-t
Stretchers	**Tab**	**N/A**	**N/A**	**N/A**	**leg-stretcher**	**ls**
Stretchers Guides	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-guides**	**lsg**

Height (%)	Slider	1	99	50	leg-stretcher-guides-height	lsg-h
Tilt Angle (%)	Slider	-100	100	0	leg-stretcher-guides-angle-tilt	lsg-αt
Front Radius (%)	Slider	0	100	0	leg-stretcher-guides-radius-front	lsg-rf
Rear Radius (%)	Slider	0	100	0	leg-stretcher-guides-radius-rear	lsg-rr
Stretchers Outer Frame	**Message**	**N/A**	**N/A**	**N/A**	**leg-stretcher-outer**	**lso**
Front Stretcher	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-front**	**lsf**
Height (%)	Slider	-100	100	0	leg-stretcher-front-height	lsf-h
Back Stretcher	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-back**	**lsb**
Height (%)	Slider	-100	100	0	leg-stretcher-back-height	lsb-h
Side Stretcher	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-side**	**lss**
Outer Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**leg-stretcher-outer-sround**	**lso-sr**
Diameter (mm)	Slider	1	280	30	leg-stretcher-outer-sround-diameter	lso-srd
Width/Depth (mm)	Slider	1	280	30	leg-stretcher-outer-ssquare-width	lso-ssw
Height (mm)	Slider	1	280	30	leg-stretcher-outer-ssquare-height	lso-ssh
Stretchers Inner Frame	**Message**	**N/A**	**N/A**	**N/A**	**leg-stretcher-inner**	**lsi**
Cross Stretcher	**Checkbox**	**False**	**True**	**False**	**leg-strether-cross**	**lsc**
Depth Spacing (%)	Slider	1	99	50	leg-stretcher-cross-Δdepth	lsc-Δd
Long Stretcher	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-long**	**lsl**
Width Front Spacing (%)	Slider	0	100	50	leg-stretcher-long-Δwidth-front	lsl-Δwf
Width Rear Spacing (%)	Slider	0	100	50	leg-stretcher-long-Δwidth-rear	lsl-Δwr
Radial Stretcher	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-radial**	**lsr**
Inner Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**leg-stretcher-inner-sround**	**lsi-sr**
Diameter (mm)	Slider	1	280	30	leg-stretcher-inner-sround-diameter	lsi-srd
Width/Depth (mm)	Slider	1	280	30	leg-stretcher-inner-ssquare-width	lsi-ssw
Height (mm)	Slider	1	280	30	leg-stretcher-inner-ssaqure-height	lsi-ssh
Stretchers Panel	**Checkbox**	**False**	**True**	**False**	**leg-stretcher-panel**	**lsp**
Thickness (mm)	Slider	1	100	10	leg-stretcher-panel-thickness	lsp-t
Base	**Tab**	**N/A**	**N/A**	**N/A**	**leg-base**	**lb**
Base Guides	**Checkbox**	**False**	**True**	**False**	**leg-base-guides**	**lbg**
Width (%)	Slider	1	100	100	leg-base-guides-width	lbg-w
Depth (%)	Slider	1	100	100	leg-base-guides-depth	lbg-d
Front Radius (%)	Slider	0	100	0	leg-base-guides-radius-front	lbg-rf
Rear Radius (%)	Slider	0	100	0	leg-base-guides-radius-rear	lbg-rr
Base Outer Frame	**Message**	**N/A**	**N/A**	**N/A**	**leg-base-outer**	**lbo**
Base Front Rail	**Checkbox**	**False**	**True**	**False**	**leg-base-front**	**lbf**
Base Back Rail	**Checkbox**	**False**	**True**	**False**	**leg-base-back**	**lbb**
Base Side Rail	**Checkbox**	**False**	**True**	**False**	**leg-base-side**	**lbs**
Outer Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**leg-base-outer-sround**	**lbo-sr**
Diameter (mm)	Slider	1	280	30	leg-base-outer-sround-diameter	lbo-srd
Width/Depth (mm)	Slider	1	280	30	leg-base-outer-ssqure-width	lbo-ssw
Height (mm)	Slider	1	280	30	leg-base-outer-ssquare-height	lbo-ssh
Base Inner Frame	**Message**	**N/A**	**N/A**	**N/A**	**leg-base-inner**	**lbi**
Base Cross Rail	**Checkbox**	**False**	**True**	**False**	**leg-base-cross**	**lbc**
Depth Spacing (%)	Slider	1	99	50	leg-base-cross-Δdepth	lbc-Δd
Base Long Rail	**Checkbox**	**False**	**True**	**False**	**leg-base-long**	**lbl**
Width Front Spacing (%)	Slider	0	100	50	leg-base-long-Δwidth-front	lbl-Δwf
Width Rear Spacing (%)	Slider	0	100	50	leg-base-long-Δwidth-rear	lbl-Δwr
Base Radial Rail	**Checkbox**	**False**	**True**	**False**	**leg-base-radial**	**lbr**
Number	Slider	3	5	4	leg-base-radial-number	lbr-n
Inner Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**leg-base-inner-sround**	**lbi-sr**
Diameter (mm)	Slider	1	280	30	leg-base-inner-sround-diameter	lbi-srd
Width/Depth (mm)	Slider	1	280	30	leg-base-inner-ssquare-width	lbi-ssw

Height (mm)	Slider	1	280	30	leg-base-inner-ssquare-height	lbi-ssh
Base Panel	**Checkbox**	**False**	**True**	**False**	**leg-base-panel**	**lbp**
Thickness (mm)	Slider	1	100	10	leg-base-panel-thickness	lbp-t
Arms	**Tab**	**N/A**	**N/A**	**N/A**	**arm**	**a**
Arms Guides	**Checkbox**	**False**	**True**	**False**	**arm-guides**	**ag**
Height (mm)	Slider	191	254	223	arm-guides-height	ag-h
Depth (%)	Slider	0	100	100	arm-guides-depth	ag-d
Depth Rear Spacing (mm)	Slider	0	100	0	arm-guides-Δdepth-rear	ag-Δdr
Tilt Angle (%)	Slider	-100	100	0	arm-guides-angle-tilt	ag-αt
Front Radius (%)	Slider	0	100	0	arm-guides-radius-front	ag-rf
Rear Radius (%)	Slider	0	100	0	arm-guides-radius-rear	ag-rr
Arms Outer Frame	**Message**	**N/A**	**N/A**	**N/A**	**arm-outer**	**ao**
Arm Front Support	**Checkbox**	**False**	**True**	**False**	**arm-support-front**	**asf**
Arm Back Support	**Checkbox**	**False**	**True**	**False**	**arm-support-back**	**asb**
Armrest	**Checkbox**	**False**	**True**	**False**	**armrest**	**ar**
Outer Frame Section	**Radiobox**	**Round**	**Square**	**Round**	**arm-outer-sround**	**ao-sr**
Diameter (mm)	Slider	1	280	30	arm-outer-sround-diameter	ao-srd
Width (mm)	Slider	1	280	30	arm-outer-ssquare-width	ao-ssw
Depth/Height (mm)	Slider	1	280	30	arm-outer-ssquare-height	ao-ssh
Arms Inner Frame	**Message**	**N/A**	**N/A**	**N/A**	**arm-inner**	**ai**
Arm Side Support	**Checkbox**	**False**	**True**	**False**	**arm-support-side**	**ass**
Depth Top Spacing (%)	Slider	0	100	50	arm-support-side-Δdepth-top	ass-Δdt
Depth Bottom Spacing (%)	Slider	0	100	50	arm-support-side-Δdepth-bottom	ass-Δdb
Section	**Radiobox**	**Round**	**Square**	**Round**	**arm-support-side-sround**	**ass-sr**
Diameter (mm)	Slider	1	280	30	arm-support-side-sround-diameter	ass-srd
Width (mm)	Slider	1	280	30	arm-support-ss-ssquare-width	ass-ssw
Depth (mm)	Slider	1	280	30	arm-support-ss-ssquare-depth	ass-ssd
Arm Panel	**Checkbox**	**False**	**True**	**False**	**arm-panel**	**ap**
Thickness (mm)	Slider	1	100	10	arm-panel-thickness	ap-t

NAME	DESCRIPTION
Display	**Visualization options**
Guides	**Shows/hides the Guides of Legs, Seat, Back and Base**
Mode	**Visualization mode (wireframe or solid)**
Legs	**Roughly vertical part which supports the seat above the ground**
Legs Guides	**Auxiliary boundary of the Legs, that guide the subparts positioning**
Front Leg	**Leg positioned forward**
Width Spacing (%)	Position between the Seat front corner (0%) and the symmetry plane (-100%); same distance outwards (100%)
Depth Spacing (%)	Position between the Seat front corner (0%) and the coronal plane (-100%); same distance outwards (100%)
Splay Angle (%)	Angle viewing between the front, between the vertical (0%) and the Base right edge (-100%); same distance outwards (100%)
Rake Angle (%)	Angle viewing from the side, between the vertical (0%) and the Base back edge (-100%); same distance outwards (100%)
Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width (mm)	Thickness width of the square section
Depth (mm)	Thickness depth of the square section
Taper Ratio (%)	Dimension of the bottom section in relation to the top section, between equal (100%) and the minimum (1%)
Back Leg	**Leg positioned backward**
Width Spacing (%)	Position between the Seat back corner (0%) and the symmetry plane (-100%); same distance outwards (100%)
Depth Spacing (%)	Position between the Seat back corner (0%) and the coronal plane (-100%); same distance outwards (100%)
Splay Angle (%)	Angle viewing between the front, between the vertical (0%) and the Base right edge (-100%); same distance outwards (100%)
Rake Angle (%)	Angle viewing from the side, between the vertical (0%) and the Base front edge (-100%); same distance outwards (100%)
Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width (mm)	Thickness width of the square section
Depth (mm)	Thickness depth of the square section
Taper Ratio (%)	Dimension of the lower section in relation to the top section, between equal (100%) and the minimum (1%)
Leg Panels	**Surface elements connecting the Legs**
Front Panel	**Surface connecting the Front Legs**
Back Panel	**Surface connecting the Back Legs**
Side Panel	**Surface connecting the Front Legs with the Back Legs on the same side**
Radial Panel	**Surface connecting the Front Legs with the Back Legs on opposite sides**
Thickness (mm)	Thickness of the panels
Seat	**Roughly horizontal part which supports a person's thighs while seated**
Seat Guides	**Auxiliary boundary of the Seat, that guide the subparts positioning**
Width (mm)	Dimension of the Seat front edge
Depth (mm)	Dimension between the Seat front and back edges, measured in the symmetry plane
Height (mm)	Dimension between the front edge of the Seat and the ground, measured vertically
Tilt Angle (°)	Angle measured from horizontal, viewing from the side
Front Radius (%)	Front corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Rear Radius (%)	Rear corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Taper Width (%)	Dimension of the rear edge in relation to the front edge, between equal (0%) and zero (100%)
Seat Outer Frame	**Outer frame parts of the Seat, located directly under the Seat (also called Aprons)**
Seat Front Rail	**The frontmost rail, being the Guides front edge or connecting the Front Legs**
Seat Back Rail	**The rearmost rail, being the Guides rear edge or connecting the Back Legs**
Seat Side Rail	**The sidemost rail, being the Guides side edge or connecting the Front and Back Legs of the same side**
Outer Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Depth (mm)	Thickness width/depth of the square section
Height (mm)	Thickness height of the square section
Seat Inner Frame	**Inner frame parts of the Seat**
Seat Cross Rail	**Rail positioned from side to side, between the Side or Long Rails (also called Centre)**

Depth Spacing (%)	Position in the Side or Long Rail, between the front (1%) and the back (99%)
Number	Number of rails
Seat Long Rail	**Rail positioned from front to back, between the Front and Back Rails or the Cross Rails**
Width Front Spacing (%)	Position in the Front or Cross Rail, between the middle (0%) and the side (100%)
Width Rear Spacing (%)	Position in the Back or Cross Rail, between the middle (0%) and the side (100%)
Number	Number of rails
Seat Radial Rail	**Rails positioned towards the center**
Number	Number of rails
Inner Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Depth (mm)	Thickness width/depth of the square section
Height (mm)	Thickness height of the square section
Seat Panel	**Planar element with the same shape of the Guides (also called Surface)**
Thickness (mm)	Thickness of the panel
Back	**Roughly vertical part which supports a person's back while seated (also called Backrest)**
Back Guides	**Auxiliary boundary of the Back, that guide the subparts positioning**
Height (mm)	Dimension between the Back top edge to the Seat back edge
Height Spacing (mm)	Dimension between the Back bottom edge to the Seat back edge
Back-Seat Angle (°)	Angle between the Seat and Back surfaces, viewing from the side
Top Radius (%)	Top corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Bottom Radius (%)	Bottom corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Width (%)	Dimension between the Seat back corner (50%) and 125mm (0%), to the end of the Seat back arc (100%)
Taper Width (%)	Dimension of the top edge in relation to the bottom edge, between equal (0%) and zero (100%), and the double (-100%)
Back Outer Frame	**Outer frame parts of the Back (also called Back Slats)**
Back Upright	**The sidemost vertical rail; often rear leg extended (also called Stile)**
Height (%)	Position in the Back side edge, between the bottom (0%) and the top (100%)
Back Top Rail	**The uppermost horizontal rail, connecting the Back Uprights (also called Crest Rail) or the arms (Cross Arm Rail)**
Back Bottom Rail	**The lowemost horizontal rail (also called Lower Rail)**
Outer Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Height (mm)	Thickness width/height of the square section
Depth (mm)	Thickness depth of the square section
Back Inner Frame	**Inner frame parts of the Back**
Back Cross Rail	**Horizontal rail positioned from side to side (also called Mid rail)**
Height (%)	Position in the Back Upright, between the bottom (0%) and the top (100%)
Number	Number of rails
Back Splat	**Vertical slat positioned from top to bottom (usually located between the uprights)**
Width Top Spacing (%)	Position in the Back Top or Cross Rail, between the middle (0%) and the side (100%)
Width Bottom Spacing (%)	Position in the Back Bottom or Cross Rail or Seat Back, between the middle (0%) and the side (100%)
Number	Number of rails
Back Radial Rail	**Two rails linking the top and bottom of the Back Upright with the centre of the Back (also called Cross Slat)**
Inner Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Height (mm)	Thickness width/height of the square section
Depth (mm)	Thickness depth of the square section
Back Panel	**Planar element with the same shape of the Guides (also called Surface)**
Thickness (mm)	Thickness of the panel
Stretchers	**Horizontal part which joins and strengthens the legs**
Stretchers Guides	**Auxiliary boundary of the Stretchers, that guide the subparts positioning**
Height (%)	Position in the Front Leg, between the bottom (0%) and the top (100%)
Tilt Angle (%)	Position in the Back Leg, between the bottom (-100%) and the height of the Stretchers front edge (0%), to the top (100%)
Front Radius (%)	Front corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)

Rear Radius (%)	Rear corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Stretchers Outer Frame	**Outer frame parts of the Stretchers**
Front Stretcher	**The frontmost rail, connecting the Front Legs**
Height (%)	Position in Front Leg, between the bottom (-100%) and the front edge of Stretchers Guides (0%), to the top (100%)
Back Stretcher	**The rearmost rail, connecting the Back Legs**
Height (%)	Position in Back Leg, between the bottom (-100%) and the back edge of Stretchers Guides (0%), to the top (100%)
Side Stretcher	**The sidemost rail, connecting the Front and Back Legs of the same side**
Outer Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Depth (mm)	Thickness width/depth of the square section
Height (mm)	Thickness height of the square section
Stretchers Inner Frame	**Inner frame parts of the Stretchers**
Cross Stretcher	**Rail positioned from side to side, between the Side or Long Rails (also called Centre)**
Depth Spacing (%)	Position in the Side or Long Rail, between the front (1%) and the back (99%)
Long Stretcher	**Rail positioned from front to back, between the Front and Back Rails or the Cross Rails**
Width Front Spacing (%)	Position in the Front or Cross Rail, between the middle (0%) and the side (100%)
Width Rear Spacing (%)	Position in the Back or Cross Rail, between the middle (0%) and the side (100%)
Radial Stretcher	**Rails connecting the Front Legs with the Back Legs on opposite sides**
Inner Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Depth (mm)	Thickness width/depth of the square section
Height (mm)	Thickness height of the square section
Stretchers Panel	**Planar element with the same shape of the Guides (also called Surface)**
Thickness (mm)	Thickness of the panel
Base	**Horizontal lowermost part which provides stability**
Base Guides	**Auxiliary boundary of the Base, that guide the subparts positioning**
Width (%)	Dimension in relation to the Seat width, between equal (100%) and the minimum (1%)
Depth (%)	Dimension in relation to the horizontal projection of the Seat and Back, between equal (100%) and the minimum (1%)
Front Radius (%)	Front corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Rear Radius (%)	Rear corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Base Outer Frame	**Outer frame parts of the Base**
Base Front Rail	**The frontmost rail, being the Guides front edge or connecting the Front Legs**
Base Back Rail	**The rearmost rail, being the Guides rear edge or connecting the Back Legs**
Base Side Rail	**The sidemost rail, being the Guides side edge or connecting the Front and Back Legs of the same side**
Outer Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Depth (mm)	Thickness width/depth of the square section
Height (mm)	Thickness height of the square section
Base Inner Frame	**Inner frame parts of the Base**
Base Cross Rail	**Rail positioned from side to side, between the Side or Long Rails (also called Centre)**
Depth Spacing (%)	Position in the Side or Long Rail, between the front (1%) and the back (99%)
Base Long Rail	**Rail positioned from front to back, between the Front and Back Rails or the Cross Rails**
Width Front Spacing (%)	Position in the Front or Cross Rail, between the middle (0%) and the side (100%)
Width Rear Spacing (%)	Position in the Back or Cross Rail, between the middle (0%) and the side (100%)
Base Radial Rail	**Rails positioned towards the center**
Number	Number of rails
Inner Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width/Depth (mm)	Thickness width/depth of the square section
Height (mm)	Thickness height of the square section
Base Panel	**Planar element with the same shape of the Guides (also called Surface)**
Thickness (mm)	Thickness of the panel

Arms	**Vertical side part which supports a person's forearms while seated; also eases the stand-up/sit-down action**
Arms Guides	**Auxiliary boundary of the Arms, that guide the subparts positioning**
Height (mm)	Height of the Armrests above the Seat (measured perpendicularly to the Seat plane)
Depth (%)	Dimension between the Seat back edge to the front of the Armrest, between equal to Seat Depth (100%) and 245 (0%)
Depth Rear Spacing (mm)	Dimension between the Seat back edge and the back of the Armrest
Tilt Angle (%)	Angle measured from horizontal, viewing from the side
Front Radius (%)	Front corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Rear Radius (%)	Rear corner radius, ranging between zero (0%) and half of the smallest edge of the Guides (100%)
Arms Outer Frame	**Outer frame parts of the Arms**
Arm Front Support	**Vertical stat which supports the Armrest, positioned forward**
Arm Back Support	**Vertical stat which supports the Armrest, positioned backward**
Armrest	**The uppermost horizontal rail**
Outer Frame Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width (mm)	Thickness width of the square section
Depth/Height (mm)	Thickness depth/height of the square section
Arms Inner Frame	**Inner frame parts of the Arms**
Arm Side Support	**Vertical stat which supports the Armrest, positioned inward**
Depth Top Spacing (%)	Position in the Armrest, between the front (0%) and the back (100%)
Depth Bottom Spacing (%)	Position in the Seat Side Rail, between the front (0%) and the back (100%)
Section	**Round or Square section**
Diameter (mm)	Diameter of the round section
Width (mm)	Thickness width of the square section
Depth (mm)	Thickness depth of the square section
Arm Panel	**Planar element with the same shape of the Guides (also called Surface)**
Thickness (mm)	Thickness of the panel

NAME	ANTECEDENT
Display	**N/A**
Guides	**N/A**
Mode	**N/A**
Legs	**N/A**
Legs Guides	**N/A**
Front Leg	**N/A**
Width Spacing (%)	N/A
Depth Spacing (%)	N/A
Splay Angle (%)	N/A
Rake Angle (%)	N/A
Section	**N/A**
Diameter (mm)	N/A
Width (mm)	N/A
Depth (mm)	N/A
Taper Ratio (%)	N/A
Back Leg	**N/A**
Width Spacing (%)	N/A
Depth Spacing (%)	N/A
Splay Angle (%)	N/A
Rake Angle (%)	N/A
Section	**N/A**
Diameter (mm)	N/A
Width (mm)	N/A
Depth (mm)	N/A
Taper Ratio (%)	N/A
Leg Panels	**N/A**
Front Panel	**N/A**
Back Panel	**N/A**
Side Panel	**N/A**
Radial Panel	**N/A**
Thickness (mm)	N/A
Seat	**N/A**
Seat Guides	**N/A**
Width (mm)	N/A
Depth (mm)	N/A
Height (mm)	N/A
Tilt Angle (°)	N/A
Front Radius (%)	N/A
Rear Radius (%)	N/A
Taper Width (%)	N/A
Seat Outer Frame	**N/A**
Seat Front Rail	**N/A**
Seat Back Rail	**N/A**
Seat Side Rail	**N/A**
Outer Frame Section	**Seat Front/Seat Back/Seat Side**
Diameter (mm)	N/A
Width/Depth (mm)	N/A
Height (mm)	N/A
Seat Inner Frame	**N/A**
Seat Cross Rail	**Seat Side/Seat Long**
Depth Spacing (%)	N/A

Number	N/A
Seat Long Rail	**Seat Front & Seat Back/Seat Cross/Back Leg; Seat Back & Seat Cross/Front Leg**
Width Front Spacing (%)	Seat Front/Seat Cross
Width Rear Spacing (%)	Seat Back/Seat Cross
Number	N/A
Seat Radial Rail	**Front Leg/Back Leg**
Number	N/A
Inner Frame Section	**Seat Cross/Seat Long/Seat Radial**
Diameter (mm)	N/A
Width/Depth (mm)	N/A
Height (mm)	N/A
Seat Panel	**N/A**
Thickness (mm)	N/A
Back	**N/A**
Back Guides	**N/A**
Height (mm)	N/A
Height Spacing (mm)	N/A
Back-Seat Angle (°)	N/A
Top Radius (%)	N/A
Bottom Radius (%)	N/A
Width (%)	N/A
Taper Width (%)	N/A
Back Outer Frame	**N/A**
Back Upright	**Back Leg/Seat Side/Armrest**
Height (%)	N/A
Back Top Rail	**Back Upright/Armrest**
Back Bottom Rail	**Back Upright**
Outer Frame Section	**Back Upright**
Diameter (mm)	N/A
Width/Height (mm)	N/A
Depth (mm)	N/A
Back Inner Frame	**N/A**
Back Cross Rail	**Back Upright**
Height (%)	N/A
Number	N/A
Back Splat	**Back Top & Back Bottom/Back Cross/Seat Back; Back Bottom/Back Cross; Seat Long**
Width Top Spacing (%)	Back Top/Back Cross
Width Bottom Spacing (%)	Back Bottom/Back Cross/Seat Back
Number	N/A
Back Radial Rail	**Back Upright**
Inner Frame Section	**Back Cross/Back Splat/Back Radial**
Diameter (mm)	N/A
Width/Height (mm)	N/A
Depth (mm)	N/A
Back Panel	**N/A**
Thickness (mm)	N/A
Stretchers	**N/A**
Stretchers Guides	**N/A**
Height (%)	N/A
Tilt Angle (%)	N/A
Front Radius (%)	N/A
Rear Radius (%)	N/A

Stretchers Outer Frame	**N/A**
Front Stretcher	**Front Leg**
Height (%)	N/A
Back Stretcher	**Back Leg**
Height (%)	N/A
Side Stretcher	**Front Leg & Back Leg/Back Panel; Back Leg & Front Panel**
Outer Frame Section	**Front Stretcher/Back Stretcher/Side Stretcher**
Diameter (mm)	N/A
Width/Depth (mm)	N/A
Height (mm)	N/A
Stretchers Inner Frame	**N/A**
Cross Stretcher	**Side Stretcher/Long Stretcher**
Depth Spacing (%)	N/A
Long Stretcher	**Front Stretcher/Back Stretcher**
Width Front Spacing (%)	Front Stretcher/Cross Stretcher
Width Rear Spacing (%)	Back Stretcher/Cross Stretcher
Radial Stretcher	**Front Leg & Back Leg**
Inner Frame Section	**Cross Stretcher/Long Stretcher/Radial Stretcher**
Diameter (mm)	N/A
Width/Depth (mm)	N/A
Height (mm)	N/A
Stretchers Panel	**N/A**
Thickness (mm)	N/A
Base	**N/A**
Base Guides	**N/A**
Width (%)	N/A
Depth (%)	N/A
Front Radius (%)	N/A
Rear Radius (%)	N/A
Base Outer Frame	**N/A**
Base Front Rail	**Front Leg/Base Side Rail**
Base Back Rail	**Back Leg/Base Side Rail**
Base Side Rail	**Front Leg/Back Leg**
Outer Frame Section	**Base Front/Base Back/Base Side**
Diameter (mm)	N/A
Width/Depth (mm)	N/A
Height (mm)	N/A
Base Inner Frame	**N/A**
Base Cross Rail	**Base Side/Base Long**
Depth Spacing (%)	N/A
Base Long Rail	**Base Front & Base Back/Base Cross/Back Leg; Base Back & Base Cross/Front Leg**
Width Front Spacing (%)	Base Front/Base Cross
Width Rear Spacing (%)	Base Back/Base Cross
Base Radial Rail	**Front Leg/Back Leg**
Number	N/A
Inner Frame Section	**Base Cross/Base Long/Base Radial**
Diameter (mm)	N/A
Width/Depth (mm)	N/A
Height (mm)	N/A
Base Panel	**N/A**
Thickness (mm)	N/A
Arms	**N/A**

Arms Guides	**N/A**
Height (mm)	N/A
Depth (%)	N/A
Depth Rear Spacing (mm)	N/A
Tilt Angle (%)	N/A
Front Radius (%)	N/A
Rear Radius (%)	N/A
Arms Outer Frame	**N/A**
Arm Front Support	**Front Leg/Seat Side**
Arm Back Support	**Back Leg/Seat Side**
Armrest	**Arm Front Support/Arm Back Support/Arm Side Support/Arm Panel**
Outer Frame Section	**Arm Front Support/Arm Back Support/Armrest**
Diameter (mm)	N/A
Width (mm)	N/A
Depth/Height (mm)	N/A
Arms Inner Frame	**N/A**
Arm Side Support	**Front Leg/Back Leg/Seat Side**
Depth Top Spacing (%)	N/A
Depth Bottom Spacing (%)	Seat Side
Section	**N/A**
Diameter (mm)	N/A
Width (mm)	N/A
Depth (mm)	N/A
Arm Panel	**N/A**
Thickness (mm)	N/A

NAME	CHANGES FROM V1.1	NAME IN V1.1	NEW TYPE
Display	**Tab/renamed**	**Guides**	**N/A**
Guides	**Checkbox/unchanged**	**N/A**	**N/A**
Mode	**Radiobox/unchanged**	**N/A**	**N/A**
Legs	**Tab/unchanged**	**N/A**	**N/A**
Legs Guides	**Checkbox/new**	**N/A**	**Guides**
Front Leg	**Checkbox/renamed**	**Leg Front**	**N/A**
Width Spacing (%)	Slider/renamed	Spacing Crosswise	N/A
Depth Spacing (%)	Slider/renamed	Spacing Lengthwise	N/A
Splay Angle (%)	Slider/renamed	Angle Splay	N/A
Rake Angle (%)	Slider/renamed	Angle Rake	N/A
Section	**Radiobox/renamed**	**Solid frame (round)**	**N/A**
Diameter (mm)	Slider/renamed	Radius (overall)	N/A
Width (mm)	Slider/renamed	Length (overall)	N/A
Depth (mm)	Slider/renamed	Width (overall)	N/A
Taper Ratio (%)	Slider/new	N/A	Taper Ratio
Back Leg	**Checkbox/renamed**	**Leg Rear**	**N/A**
Width Spacing (%)	Slider/renamed	Spacing Crosswise	N/A
Depth Spacing (%)	Slider/renamed	Spacing Lengthwise	N/A
Splay Angle (%)	Slider/renamed	Angle Splay	N/A
Rake Angle (%)	Slider/renamed	Angle Rake	N/A
Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width (mm)	Slider/new	N/A	Solid
Depth (mm)	Slider/new	N/A	Solid
Taper Ratio (%)	Slider/new	N/A	Taper Ratio
Leg Panels	**Message/new**	**N/A**	**Group**
Front Panel	**Checkbox/new**	**N/A**	**Panel**
Back Panel	**Checkbox/new**	**N/A**	**Panel**
Side Panel	**Checkbox/new**	**N/A**	**Panel**
Radial Panel	**Checkbox/new**	**N/A**	**Panel**
Thickness (mm)	Slider/renamed	Thickness (overall)	N/A
Seat	**Tab/unchanged**	**N/A**	**N/A**
Seat Guides	**Checkbox/new**	**N/A**	**Guides**
Width (mm)	Slider/renamed	Length	N/A
Depth (mm)	Slider/renamed	Width	N/A
Height (mm)	Slider/unchanged	N/A	N/A
Tilt Angle (°)	Slider/renamed	Seat Angle	N/A
Front Radius (%)	Slider/renamed	Radius Front	N/A
Rear Radius (%)	Slider/renamed	Radius Rear	N/A
Taper Width (%)	Slider/renamed	Taper Angle	N/A
Seat Outer Frame	**Message/new**	**N/A**	**Group**
Seat Front Rail	**Checkbox/renamed**	**Seat Front**	**N/A**
Seat Back Rail	**Checkbox/renamed**	**Seat Rear**	**N/A**
Seat Side Rail	**Checkbox/renamed**	**Seat Side**	**N/A**
Outer Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Depth (mm)	Slider/new	N/A	Solid
Height (mm)	Slider/new	N/A	Solid
Seat Inner Frame	**Message/new**	**N/A**	**Group**
Seat Cross Rail	**Checkbox/renamed**	**Seat Cross**	**N/A**
Depth Spacing (%)	Slider/renamed	Spacing Crosswise	N/A

Number	Slider/new	N/A	Number
Seat Long Rail	**Checkbox/renamed**	**Seat Lenghwise**	**N/A**
Width Front Spacing (%)	Slider/renamed	Spacing lengthwise front	N/A
Width Rear Spacing (%)	Slider/renamed	Spacing lengthwise rear	N/A
Number	Slider/new	N/A	Number
Seat Radial Rail	**Checkbox/renamed**	**Seat X**	**N/A**
Number	Slider/new	N/A	Number
Inner Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Depth (mm)	Slider/new	N/A	Solid
Height (mm)	Slider/new	N/A	Solid
Seat Panel	**Checkbox/renamed**	**Seat Surface**	**N/A**
Thickness (mm)	Slider/new	N/A	Solid
Back	**Tab/unchanged**	**N/A**	**N/A**
Back Guides	**Checkbox/new**	**N/A**	**Guides**
Height (mm)	Slider/unchanged	N/A	N/A
Height Spacing (mm)	Slider/renamed	Back Height	N/A
Back-Seat Angle (°)	Slider/renamed	Back Angle	N/A
Top Radius (%)	Slider/new	N/A	Guides
Bottom Radius (%)	Slider/new	N/A	Guides
Width (%)	Slider/new	N/A	Guides
Taper Width (%)	Slider/new	N/A	Guides
Back Outer Frame	**Message/new**	**N/A**	**Group**
Back Upright	**Checkbox/unchanged**	**N/A**	**N/A**
Height (%)	Slider/new	N/A	Back Rail
Back Top Rail	**Checkbox/renamed**	**Back Top**	**N/A**
Back Bottom Rail	**Checkbox/new**	**N/A**	**Back Rail**
Outer Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Height (mm)	Slider/new	N/A	Solid
Depth (mm)	Slider/new	N/A	Solid
Back Inner Frame	**Message/new**	**N/A**	**Group**
Back Cross Rail	**Checkbox/renamed**	**Back Cross**	**N/A**
Height (%)	Slider/unchanged	N/A	N/A
Number	Slider/new	N/A	Number
Back Splat	**Checkbox/unchanged**	**N/A**	**N/A**
Width Top Spacing (%)	Slider/renamed	Spacing Crosswise	N/A
Width Bottom Spacing (%)	Slider/new	N/A	Long Rail
Number	Slider/new	N/A	Number
Back Radial Rail	**Checkbox/new**	**N/A**	**Back Rail**
Inner Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Height (mm)	Slider/new	N/A	Solid
Depth (mm)	Slider/new	N/A	Solid
Back Panel	**Checkbox/renamed**	**Back Surface**	**N/A**
Thickness (mm)	Slider/new	N/A	Solid
Stretchers	**Tab/unchanged**	**N/A**	**N/A**
Stretchers Guides	**Checkbox/new**	**N/A**	**Guides**
Height (%)	Slider/renamed	Height (of Stretcher Side)	N/A
Tilt Angle (%)	Slider/new	N/A	Guides
Front Radius (%)	Slider/new	N/A	Guides
Rear Radius (%)	Slider/new	N/A	Guides

Stretchers Outer Frame	**Message/new**	**N/A**	**Group**
Front Stretcher	**Checkbox/renamed**	**Stretcher Front**	**N/A**
Height (%)	Slider/unchanged	N/A	N/A
Back Stretcher	**Checkbox/renamed**	**Stretcher Rear**	**N/A**
Height (%)	Slider/unchanged	N/A	N/A
Side Stretcher	**Checkbox/renamed**	**Stretcher Side**	**N/A**
Outer Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Depth (mm)	Slider/new	N/A	Solid
Height (mm)	Slider/new	N/A	Solid
Stretchers Inner Frame	**Message/new**	**N/A**	**Group**
Cross Stretcher	**Checkbox/renamed**	**Stretcher Cross**	**N/A**
Depth Spacing (%)	Slider/renamed	Spacing Crosswise	N/A
Long Stretcher	**Checkbox/new**	**N/A**	**Long Rail**
Width Front Spacing (%)	Slider/new	N/A	Long Rail
Width Rear Spacing (%)	Slider/new	N/A	Long Rail
Radial Stretcher	**Checkbox/renamed**	**Stretcher X**	**N/A**
Inner Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Depth (mm)	Slider/new	N/A	Solid
Height (mm)	Slider/new	N/A	Solid
Stretchers Panel	**Checkbox/new**	**N/A**	**Panel**
Thickness (mm)	Slider/new	N/A	Solid
Base	**Tab/unchanged**	**N/A**	**N/A**
Base Guides	**Checkbox/new**	**N/A**	**Guides**
Width (%)	Slider/new	N/A	Guides
Depth (%)	Slider/new	N/A	Guides
Front Radius (%)	Slider/new	N/A	Guides
Rear Radius (%)	Slider/new	N/A	Guides
Base Outer Frame	**Message/new**	**N/A**	**Group**
Base Front Rail	**Checkbox/renamed**	**Base Front**	**N/A**
Base Back Rail	**Checkbox/renamed**	**Base Rear**	**N/A**
Base Side Rail	**Checkbox/renamed**	**Base Side**	**N/A**
Outer Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Depth (mm)	Slider/new	N/A	Solid
Height (mm)	Slider/new	N/A	Solid
Base Inner Frame	**Message/new**	**N/A**	**Group**
Base Cross Rail	**Checkbox/renamed**	**Base Cross**	**N/A**
Depth Spacing (%)	Slider/renamed	Spacing Crosswise	N/A
Base Long Rail	**Checkbox/new**	**N/A**	**Long Rail**
Width Front Spacing (%)	Slider/new	N/A	Long Rail
Width Rear Spacing (%)	Slider/new	N/A	Long Rail
Base Radial Rail	**Checkbox/renamed**	**Base X**	**N/A**
Number	Slider/new	N/A	Number
Inner Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width/Depth (mm)	Slider/new	N/A	Solid
Height (mm)	Slider/new	N/A	Solid
Base Panel	**Checkbox/new**	**N/A**	**Panel**
Thickness (mm)	Slider/new	N/A	Solid
Arms	**Tab/unchanged**	**N/A**	**N/A**

Arms Guides	**Checkbox/renamed**	**Armchair Guides**	**N/A**
Height (mm)	Slider/unchanged	N/A	N/A
Depth (%)	Slider/renamed	Armrest depth front	N/A
Depth Rear Spacing (mm)	Slider/renamed	Armrest depth rear	N/A
Tilt Angle (%)	Slider/new	N/A	Guides
Front Radius (%)	Slider/new	N/A	Guides
Rear Radius (%)	Slider/new	N/A	Guides
Arms Outer Frame	**Message/new**	**N/A**	**Group**
Arm Front Support	**Checkbox/renamed**	**Arm support Front**	**N/A**
Arm Back Support	**Checkbox/renamed**	**Arm support Rear**	**N/A**
Armrest	**Checkbox/unchanged**	**N/A**	**N/A**
Outer Frame Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width (mm)	Slider/new	N/A	Solid
Depth/Height (mm)	Slider/new	N/A	Solid
Arms Inner Frame	**Message/new**	**N/A**	**Group**
Arm Side Support	**Checkbox/renamed**	**Arm support Side**	**N/A**
Depth Top Spacing (%)	Slider/renamed	Crosswise Spacing	N/A
Depth Bottom Spacing (%)	Slider/new	N/A	Long Rail
Section	**Radiobox/new**	**N/A**	**Solid**
Diameter (mm)	Slider/new	N/A	Solid
Width (mm)	Slider/new	N/A	Solid
Depth (mm)	Slider/new	N/A	Solid
Arm Panel	**Checkbox/new**	**N/A**	**Panel**
Thickness (mm)	Slider/new	N/A	Solid

Appendix 4.B.2 Types (table)

NAME	ID	DESCRIPTION	EXAMPLES
Legs	**L**	**Leg Types**	**N/A**
Legs (Number)	**N/A**	**Number and position of the Legs**	**N/A**
Pedestal	L1C	Chair with one central Leg	Tulip
1-Legged Cantilever	L1F	Chair with one Leg in the front	No. B5 (p. 482)
1-Legged Reverse Cantilever	L1B	Chair with one Leg in the back	-
Cantilever	L2F	Chair with two Legs in the front	S33
Reverse Cantilever	L2B	Chair with two Legs in the back	Magic
2-Legged Pedestal	L2FB	Chair with two Legs in the middle front/back	Santa (p. 559)
2-Legged Pedestal	L2S	Chair with two Legs in the middle sides	Teodora (p. 486)
3-Legged	L3F	Chair with three Legs - two in the front and one in the back	Tripeça
Reverse 3-Legged	L3B	Chair with three Legs - one in the front and two in the back	Ant
4-Legged	L4	Chair with four Legs	214
Double legged	L4+	Chair with double Legs (more than one Front and/or Back Leg)	RCP2
Legs (Shape)	**N/A**	**Shape of the Legs (X-shape and solid shape)**	**N/A**
X-legged	L4X1	Chair with four Legs, crossing in the front or in the back	-
X-legged	L4XII	Chair with four Legs, crossing in the sides	Kreuzschwinger (p. 504)
X-legged	L4X=	Chair with four Legs, crossing in the front and in the back	MK (p. 182)
X-legged	L4XC	Chair with four Legs, crossing in the centre	Tripode (p. 203)
X-legged	L4+X	Chair with double crossed Legs	Butterfly
4-Legged Solid	L4●1	Chair with one paneled Leg	Bellevue
Parallel	L4●II	Chair with two paneled Legs in the sides	Kazuki (p. 418)
Parallel (reverse)	L4●=	Chair with two paneled Legs in the front and in the back	Plywood (p. 220)
X-shaped	L4●X	Chair with two paneled X-shaped Legs	Standard (p. 159)
U-Shaped	L4●U	Chair with three paneled U-shaped Legs	-
U-shaped (reverse)	L4●UR	Chair with three paneled U-shaped Legs	El Lissitzky (p. 134)
Monolithic Base	L4●O	Chair with four paneled legs in the sides, front and back	Molar (p. 372)
Legs (Angle)	**N/A**	**Angle of the Legs**	**N/A**
Angled Outward - Splayed/Raked	L4OSR	Chair whose Legs are angled outward from the Seat Centre	DKR
Angled Outward - Raked	L4OR	Chair whose Legs are angled outward from the Seat Side	Polyside
Angled Outward - Splayed	L4OS	Chair whose Legs are angled outward from the Seat Front and Back	-
Angled Inward - Splayed/Raked	L4ISR	Chair whose Legs are angled inward towards the Base Centre	Contour (p. 382)
Angled Inward - Raked	L4IR	Chair whose Legs are angled inward towards the Base Side	Model No. MC767 (p. 139)
Angled Inward - Splayed	L4IS	Chair whose Legs are angled inward towards the Base Front and Back	-
Legs (Section Shape)	**LS**	**Section shape of the Legs**	**N/A**
Round Section	L4SO	Chair with round Legs	S33
Square Section	L4S□	Chair with square Legs	DCW
Tapered	L4SΔ	Chair with tapered Legs	214
Seat	**S**	**Seat Types**	**N/A**
Seat (Outer Shape)	**N/A**	**Outer Shape of the Seat**	**N/A**
Square Seat	S□	Chair with a square shaped Seat	S33
Circular Seat	SO	Chair with a circular shaped Seat (also called Round)	214
Semicircular Seat	SΦ	Chair with a semicircular shaped Seat (usually in the back)	Gonçalo
Trapezoid Seat	SΔ	Chair with a trapezoid shaped Seat (usually narrowing backward)	S
Seat (Shape)	**N/A**	**Shape of the Seat Subparts**	**N/A**
Single	S1	Chair with one Seat rail (located in the front, back or side)	Louis 20
Parallel	SII	Chair with two parallel Seat rails, located in the sides	S
Parallel (reverse)	S=	Chair with two parallel Seat rails, located in the front and back	Landi

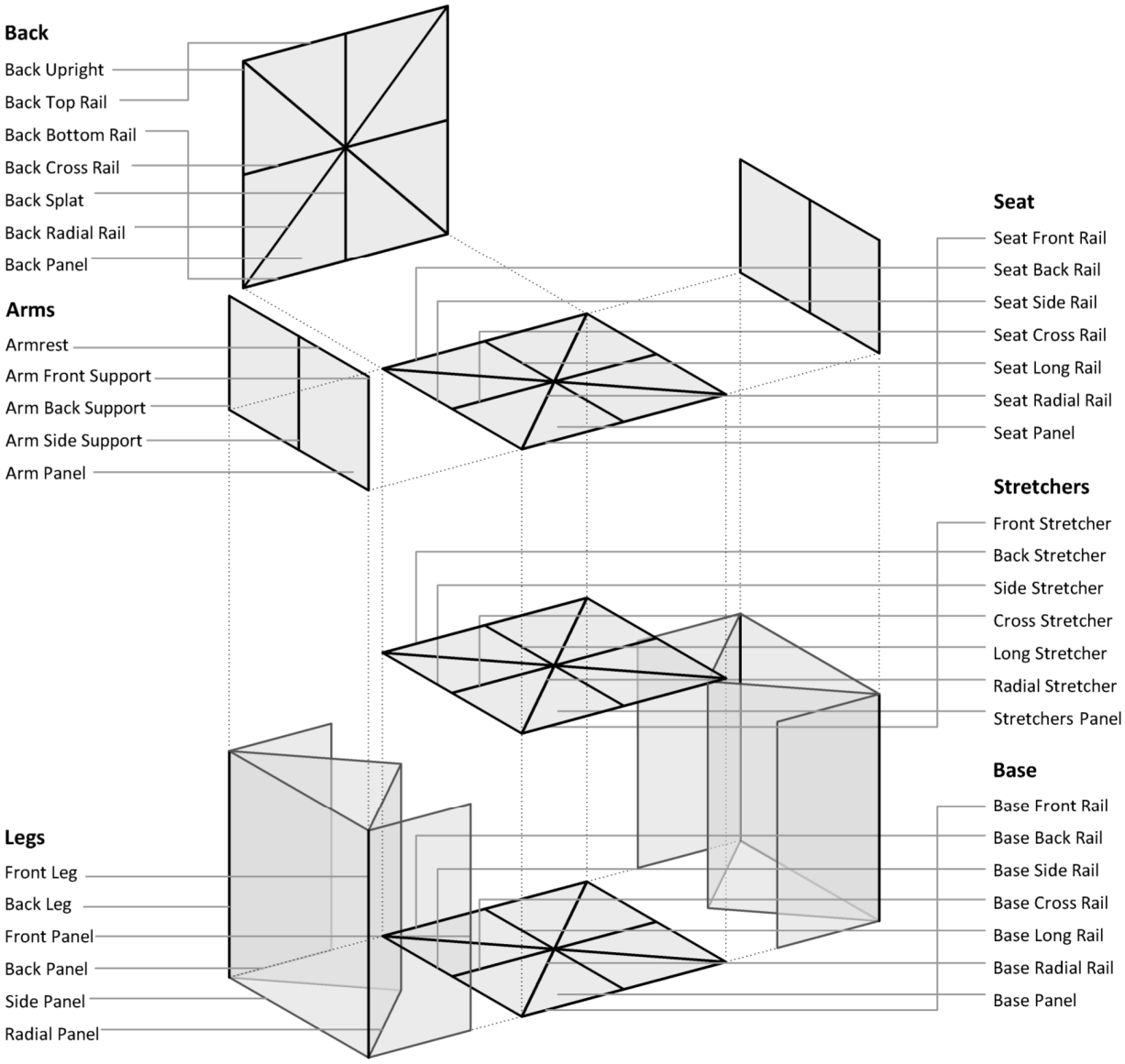
Mesh	S#	Chair with an orthogonal mesh-shaped Seat frame	DKR
X-shaped	SX	Chair with a X-shaped Seat	HAL
H-shaped	SH	Chair with a H-shaped Seat	DAX
H-shaped (reverse)	SHR	Chair with a H-shaped Seat, rotated 90 degrees	DCW
U-shaped	SU	Chair with a U-shaped Seat	Bellevue
U-shaped (reverse)	SUR	Chair with an inverted U-shaped Seat	Gonçalo
3-Star	S*3	Chair with a three-pointed star shaped Seat	PK9
5-Star	S*5	Chair with a five-pointed star shaped Seat	UNK
Box	SO	Chair with a box-shaped Seat (without inner frame)	214
Solid	S●	Chair with a solid Seat panel	214
Back	**B**	**Back Types**	**N/A**
Back (Inner Shape)	**N/A**	**Shape of the Back Inner Frame**	**N/A**
Single	B1	Chair Back with a single central vertical slat	Tripeça
Splat	BII	Chair Back with vertical slats (called Spindle in the case of rounded slats)	Wishbone
Ladder back	B=	Chair Back with horizontal cross rails (resembling a ladder)	214
Mesh	B#	Chair Back with horizontal and vertical slats (mesh-shaped)	DKR
X-shaped	BX	Chair Back with an X-shaped inner frame (also called Cross)	Chair_One
Open back	BO	Chair Back without inner elements	Ply
Solid	B●	Chair with a solid Back panel	S33
Back (Outer Shape)	**N/A**	**Outer Shape of the Back**	**N/A**
Square	B□	Chair with a square shaped Back	S33
Circular	BO	Chair with a circular shaped Back	Ant
Semi-circular	BΦ	Chair with a semicircular shaped Back (also called Bow back)	214
Trapezoid	BΔ	Chair with a trapezoid shaped Back	Bellevue
Back (Height)	**N/A**	**Height of the Back (Pheasant [1986] 2003)**	**N/A**
Low-backed	BS	Back that supports the lumbar and lower thoracic areas (about 400mm)	DCW
Medium-backed	BM	Back that supports the mid-thoracic area (about 500mm) or the overall back area (about 650mm)	S
High-backed	BL	Back that supports the back, neck and head areas (about 900mm)	Hill House (p. 65)
Stretchers	**LS**	**Stretchers Types**	**N/A**
Stretchers (Shape)	**N/A**	**Shape of the Stretchers Subparts**	**N/A**
None	LSØ	Chair without Stretchers	Landi
Single	LS1	Chair with one Stretcher (located in the front, back or middle)	La Tourette
Parallel	LSII	Chair with two parallel Stretchers, located in the sides	Costureira
Parallel (reverse)	LS=	Chair with two parallel Stretchers, located in the front and back	Antelope
X-shaped	LSX	Chair with a X-shaped Stretcher	DKR
H-shaped	LSH	Chair with a H-shaped Stretcher	Spaghetti
H-shaped (reverse)	LSHR	Chair with a H-shaped Stretcher, rotated 90 degrees	Tokyo (p. 507)
U-shaped	LSU	Chair with a U-shaped Stretcher	Bellevue
U-shaped (reverse)	LSUR	Chair with an inverted U-shaped Stretcher	Chair (p. 102)
Box	LSO	Chair with box-shaped Stretchers (without inner frame)	214
Solid	LS●	Chair with a solid Stretcher panel	Wiggle
Stretchers (Outer Shape)	**N/A**	**Outer Shape of the Stretchers**	**N/A**
Square	LS□	Chair with square shaped Stretchers	Superleggera
Circular	LSO	Chair with circular shaped Stretchers	214
Semi-circular	LSΦ	Chair with semicircular shaped Stretchers	No. 330 (p. 75)
Trapezoid	LSΔ	Chair with trapezoid shaped Stretchers	Superleggera
Base	**LB**	**Base Types**	**N/A**
Base (Shape)	**N/A**	**Shape of the Base Subparts**	**N/A**
None	LBØ	Chair without Base	214
Single	LB1	Chair with one Base rail	Steltman (p. 323)
Sled	LBII	Chair with two parallel Base rails, located in the sides	Magic
Parallel (reverse)	LB=	Chair with two parallel Base rails, located in the front and back	Sof Sof (p. 441)

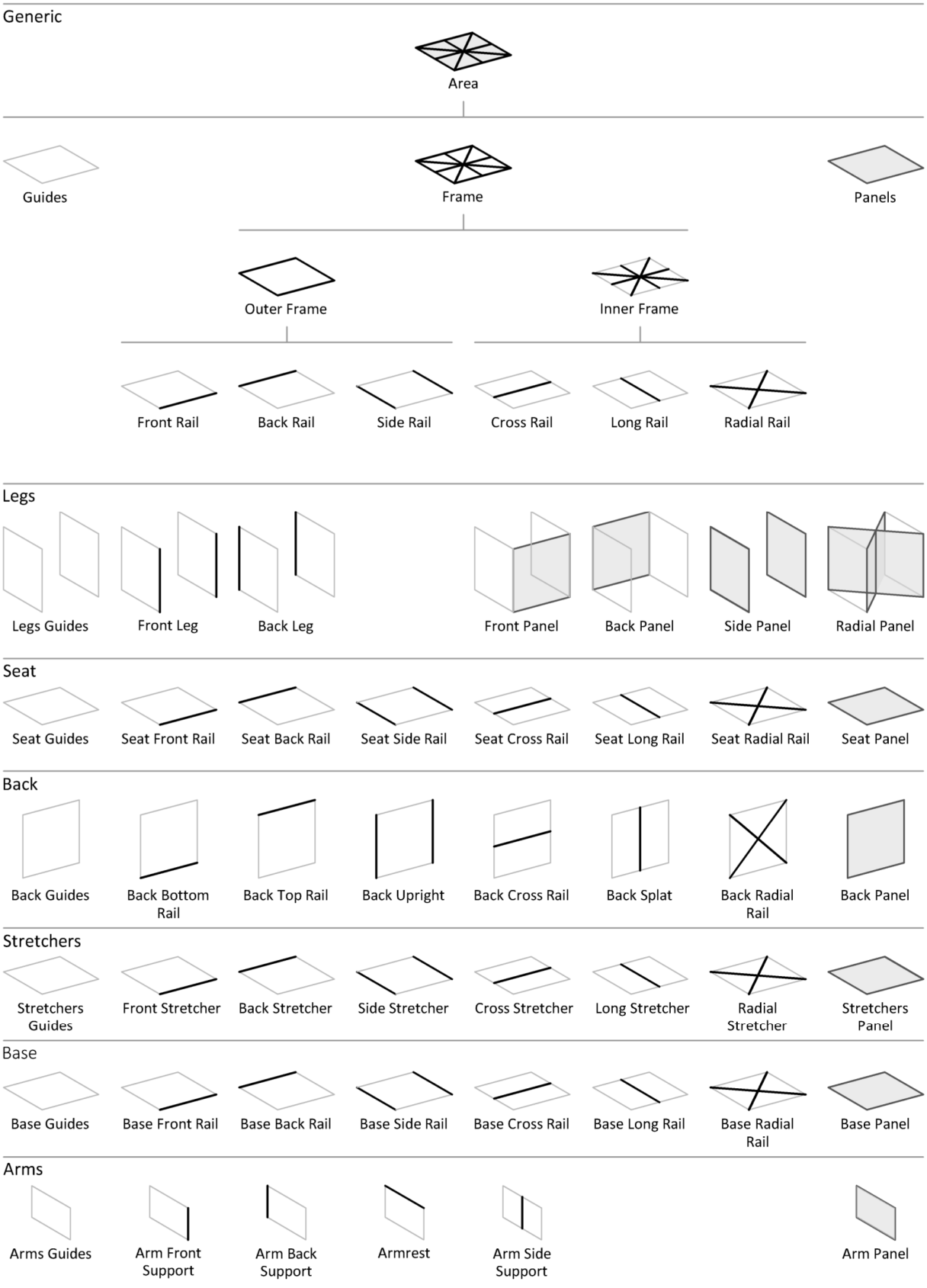
X-shaped	LBX	Chair with a X-shaped Base (also called 4-Star)	Swag Leg
H-shaped	LBH	Chair with a H-shaped Base	MR50 (p. 115)
H-shaped (reverse)	LBHR	Chair with a H-shaped Base, rotated 90 degrees	-
U-shaped	LBU	Chair with a U-shaped Base	Alessia (p. 425)
U-shaped (reverse)	LBUR	Chair with an inverted U-shaped Base	S33
3-Star	LB*3	Chair with a three-pointed star shaped Base	PK9
5-Star	LB*5	Chair with a five-pointed star shaped Base	Supporto (p. 451)
Box	LBO	Chair with a box-shaped Base (without inner frame)	S
Solid	LB●	Chair with a solid Base panel	Tulip
Base (Outer Shape)	**N/A**	**Outer Shape of the Base**	**N/A**
Square	LB□	Chair with a square shaped Base	Zig-Zag
Circular	LBO	Chair with a circular shaped Base	Tulip
Semi-circular	LBΦ	Chair with a semicircular shaped Base	Panton
Trapezoid	LBΔ	Chair with a trapezoid shaped Base	Diamond (p. 255)
Arms	**A**	**Arms Types**	**N/A**
Arms (Number)	**N/A**	**Number of Arms**	**N/A**
Armless chair	AØ	Chair without armrests (also called side chair)	214
Armchair	A2	Chair with armrests	Landi
Arms (Shape)	**N/A**	**Shape of the Arms Subparts**	**N/A**
Solid armchair	A●	Chair with solid Arms panels	DAX
Arms (Outer Shape)	**N/A**	**Outer Shape of the Arms**	**N/A**
Square	A□	Chair with square shaped Arms	Landi
Circular	A O	Chair with circular shaped Arms	Swan (p. 287)
Semi-circular	AΦ	Chair with semicircular shaped Arms	Gonçalo
Trapezoid	AΔ	Chair with trapezoid shaped Arms	Antelope
Chair (Pieces Number)	**P**	**Number of pieces or components**	**N/A**
One-piece	PA	One-piece chair	Bofinger
Shell	PS	Chair with a one-piece Seat and Back	Landi
Arm Shell	PSA	Chair with a one-piece Seat, Back and Arms	DAX
Legs (Curves)	**LC**	**Number of Legs curvature**	**N/A**
Straight	LCØ	Chair with straight Legs	DAX
Single Curvature	LC1	Legs with a single curvature (called Saber for a concave or inward curvature)	214
Double Curvature	LC2	Legs with two curvatures (called Cabriole for a convex curvature in top)	Ply
Multiple Curvature	LC3	Legs with more than two curvatures (also called Serpentine)	Swag Leg

Legend:

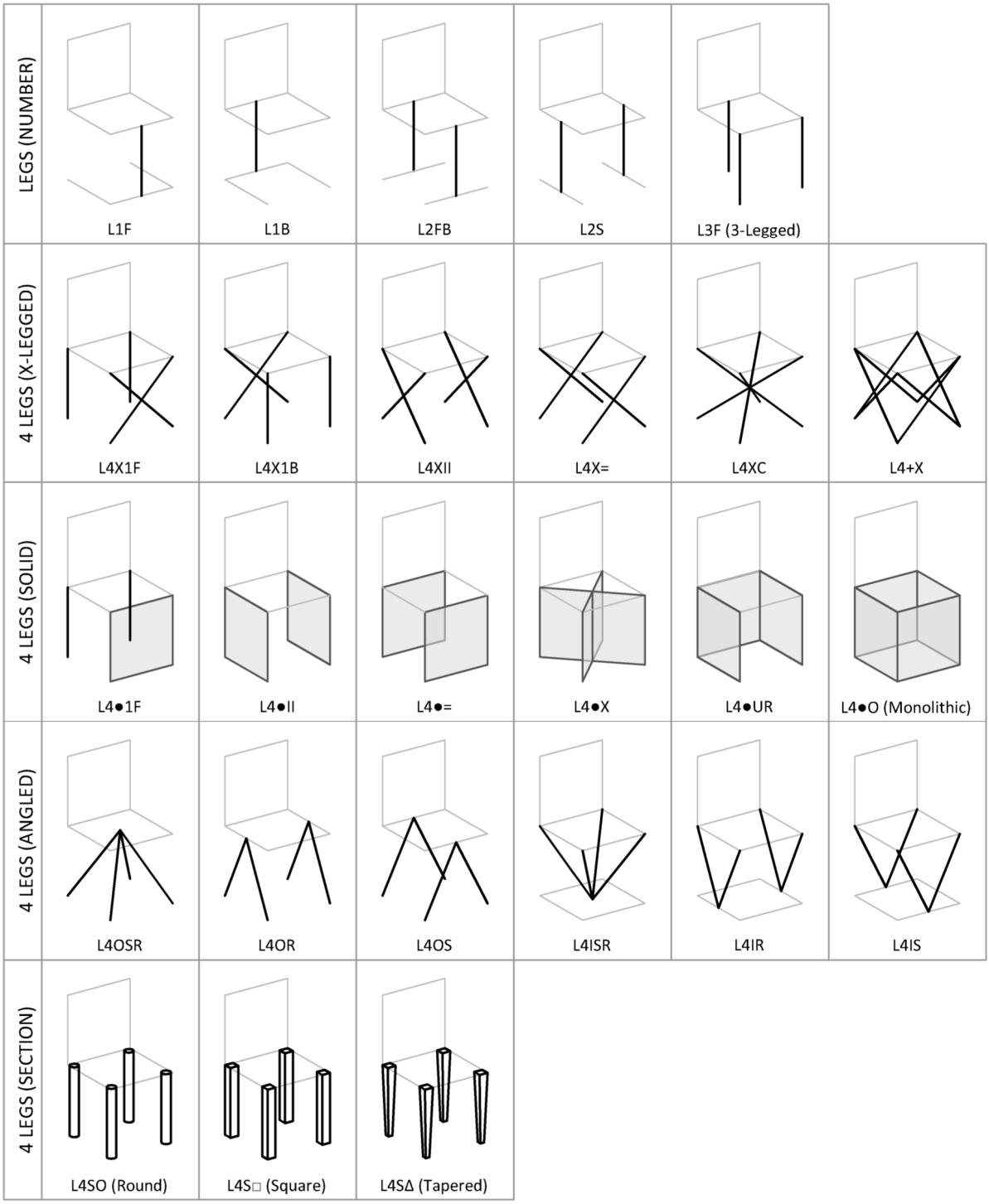
Main types
Chairs from (Fiell & Fiell [1997] 2012)

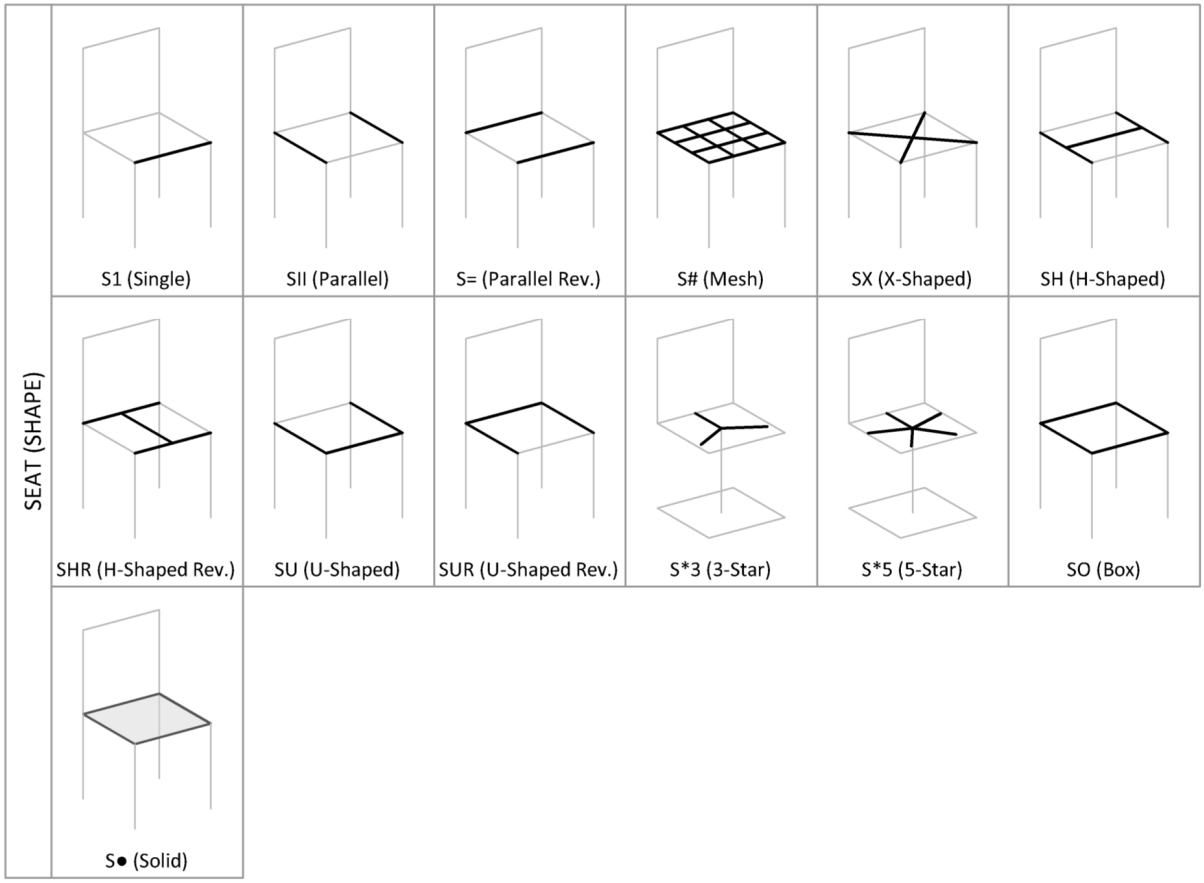
Appendix 4.B.3 Parts (schema)

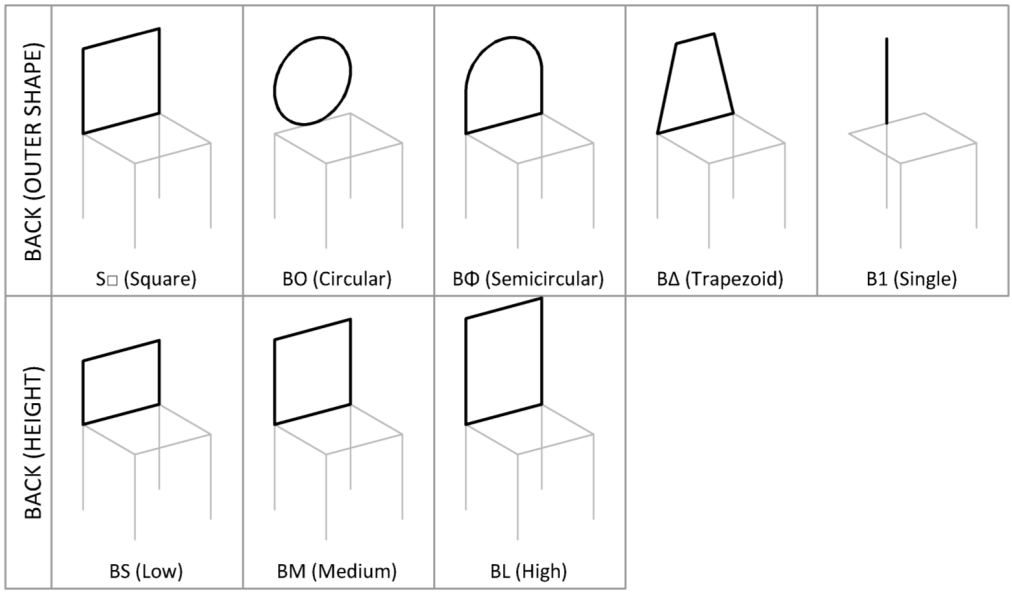


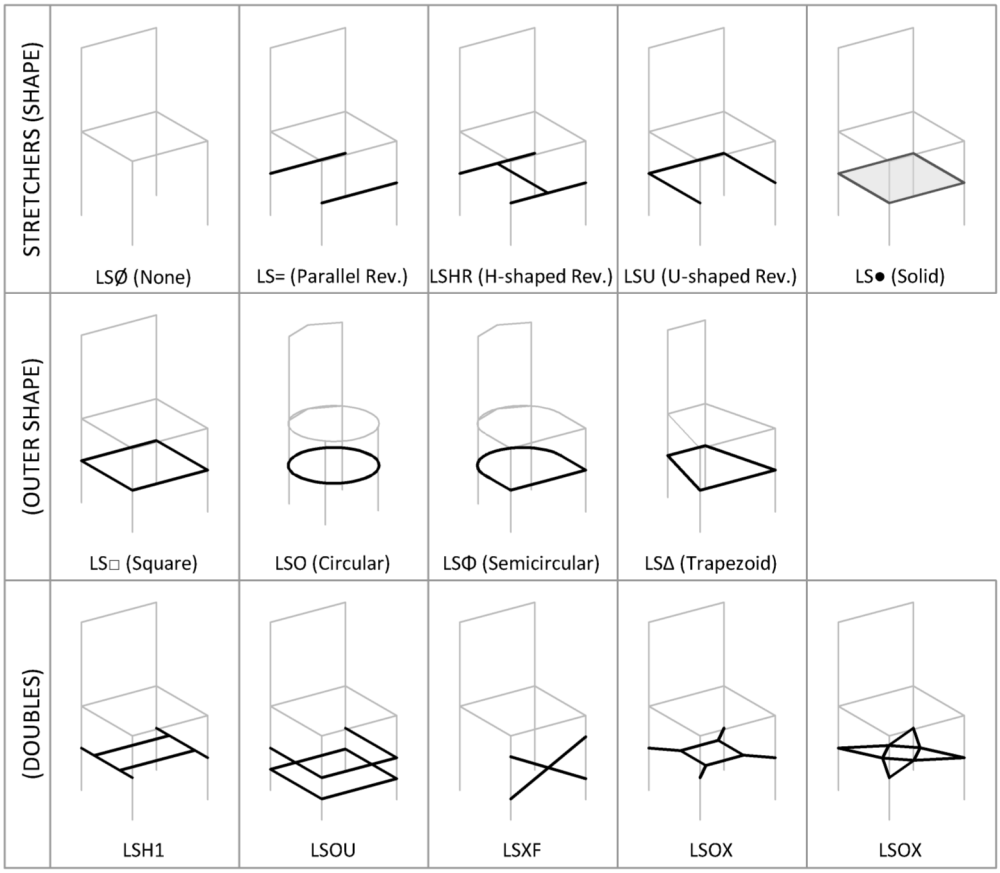

Generic
Area
Guides
Frame
Panels
Outer Frame
Inner Frame
Front Rail
Back Rail
Side Rail
Cross Rail
Long Rail
Radial Rail
Legs
Legs Guides
Front Leg
Back Leg
Front Panel
Back Panel
Side Panel
Radial Panel
Seat
Seat Guides
Seat Front Rail
Seat Back Rail
Seat Side Rail
Seat Cross Rail
Seat Long Rail
Seat Radial Rail
Seat Panel
Back
Back Guides
Back Bottom Rail
Back Top Rail
Back Upright
Back Cross Rail
Back Splat
Back Radial Rail
Back Panel
Stretchers
Stretchers Guides
Front Stretcher
Back Stretcher
Side Stretcher
Cross Stretcher
Long Stretcher
Radial Stretcher
Stretchers Panel
Base
Base Guides
Base Front Rail
Base Back Rail
Base Side Rail
Base Cross Rail
Base Long Rail
Base Radial Rail
Base Panel
Arms
Arms Guides
Arm Front Support
Arm Back Support
Armrest
Arm Side Support
Arm Panel

Appendix 4.B.4 Types (schema)

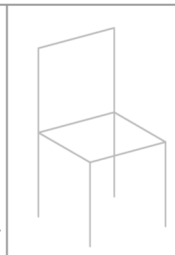


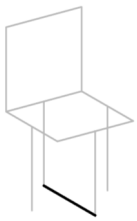

SEAT (SHAPE)
S1 (Single)
SII (Parallel)
S= (Parallel Rev.)
S# (Mesh)
SX (X-Shaped)
SH (H-Shaped)
SHR (H-Shaped Rev.)
SU (U-Shaped)
SUR (U-Shaped Rev.)
S*3 (3-Star)
S*5 (5-Star)
SO (Box)
S● (Solid)

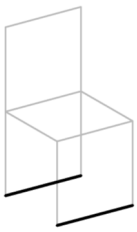

BACK (OUTER SHAPE)
S□ (Square)
BO (Circular)
BΦ (Semicircular)
BΔ (Trapezoid)
B1 (Single)
BACK (HEIGHT)
BS (Low)
BM (Medium)
BL (High)

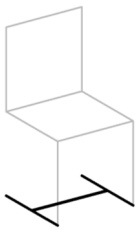

STRETCHERS (SHAPE)
LSØ (None)
LS= (Parallel Rev.)
LSHR (H-shaped Rev.)
LSU (U-shaped Rev.)
LS● (Solid)
(OUTER SHAPE)
LS□ (Square)
LSO (Circular)
LSΦ (Semicircular)
LSΔ (Trapezoid)
(DOUBLES)
LSH1
LSOU
LSXF
LSOX
LSOX

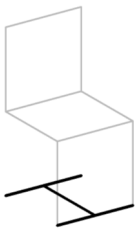
BASE (SHAPE)

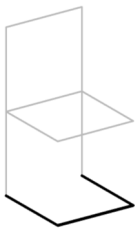

LBØ (None)

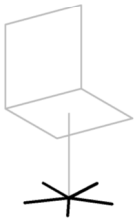

LB1 (Single)


LB= (Parallel Rev.)

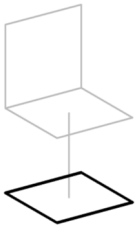

LBH (H-shaped)

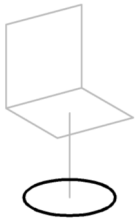

LBHR (H-shaped Rev.)

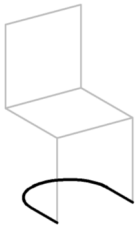

LBU (U-shaped)

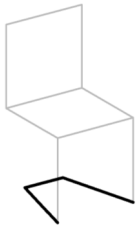

LB*5 (5-Star)

BASE (OUTER SHAPE)

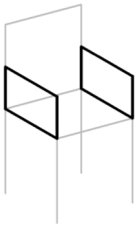

LB□ (Square)

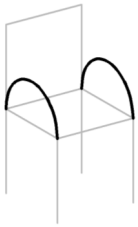

LBO (Circular)

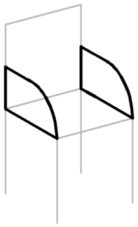

LBΦ (Semicircular)

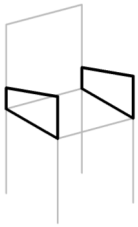

LBΔ (Trapezoid)

ARMS (OUTER SHAPE)

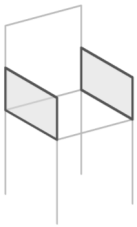

A□ (Square)

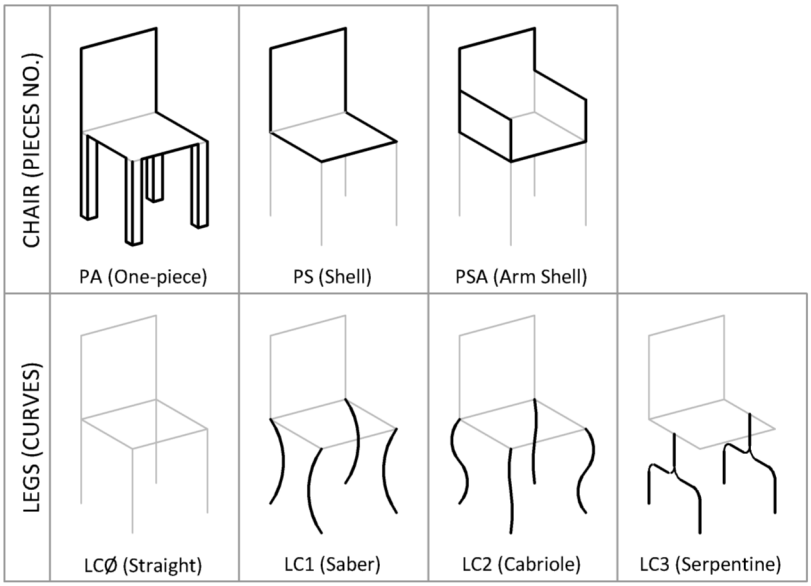

AO (Circular)


AΦ (Semicircular)

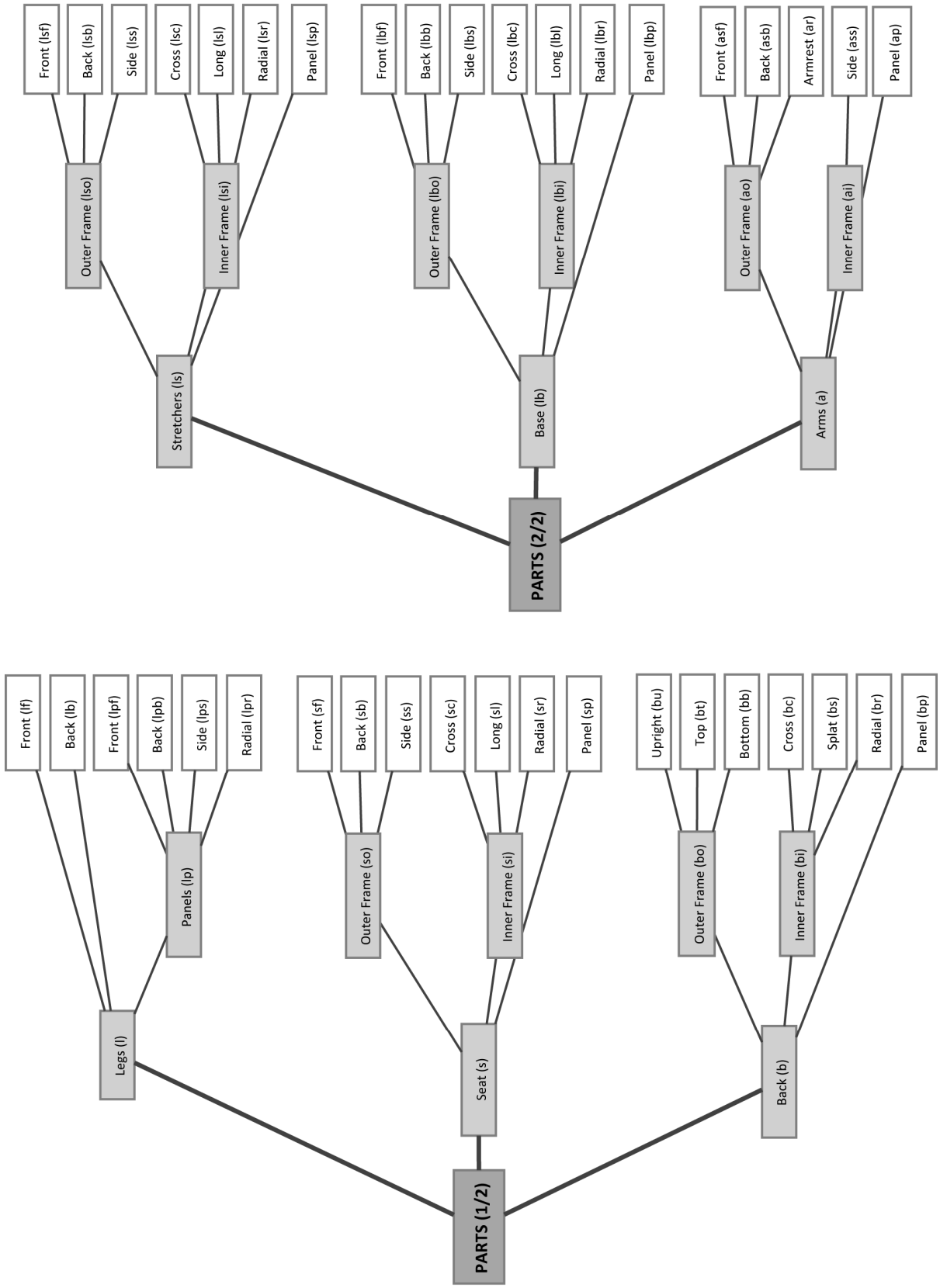

AΔ (Trapezoid)

ARMS (SHAPE)

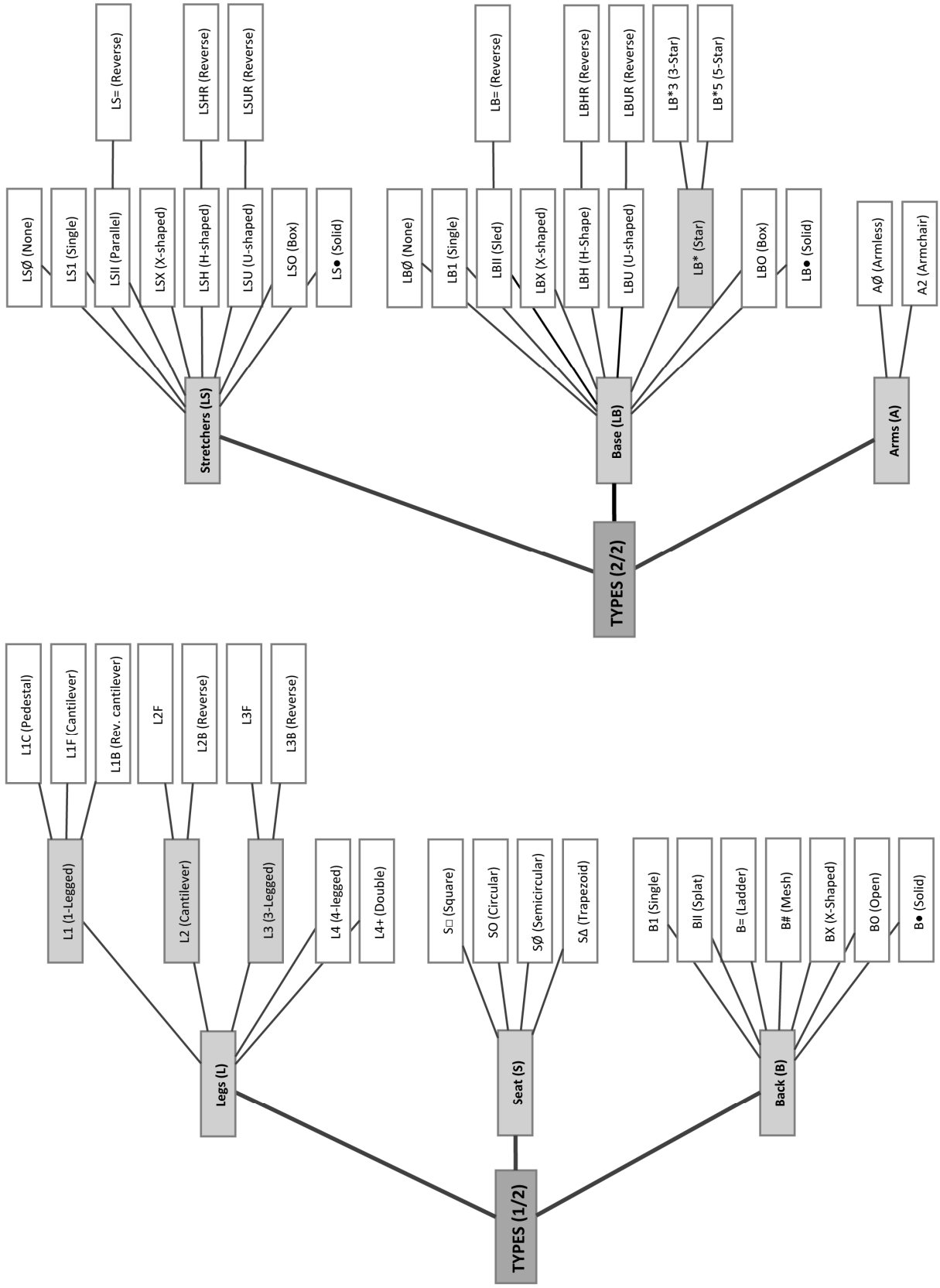

A● (Solid)


CHAIR (PIECES NO.)
PA (One-piece)
PS (Shell)
PSA (Arm Shell)
LEGS (CURVES)
LCØ (Straight)
LC1 (Saber)
LC2 (Cabriole)
LC3 (Serpentine)

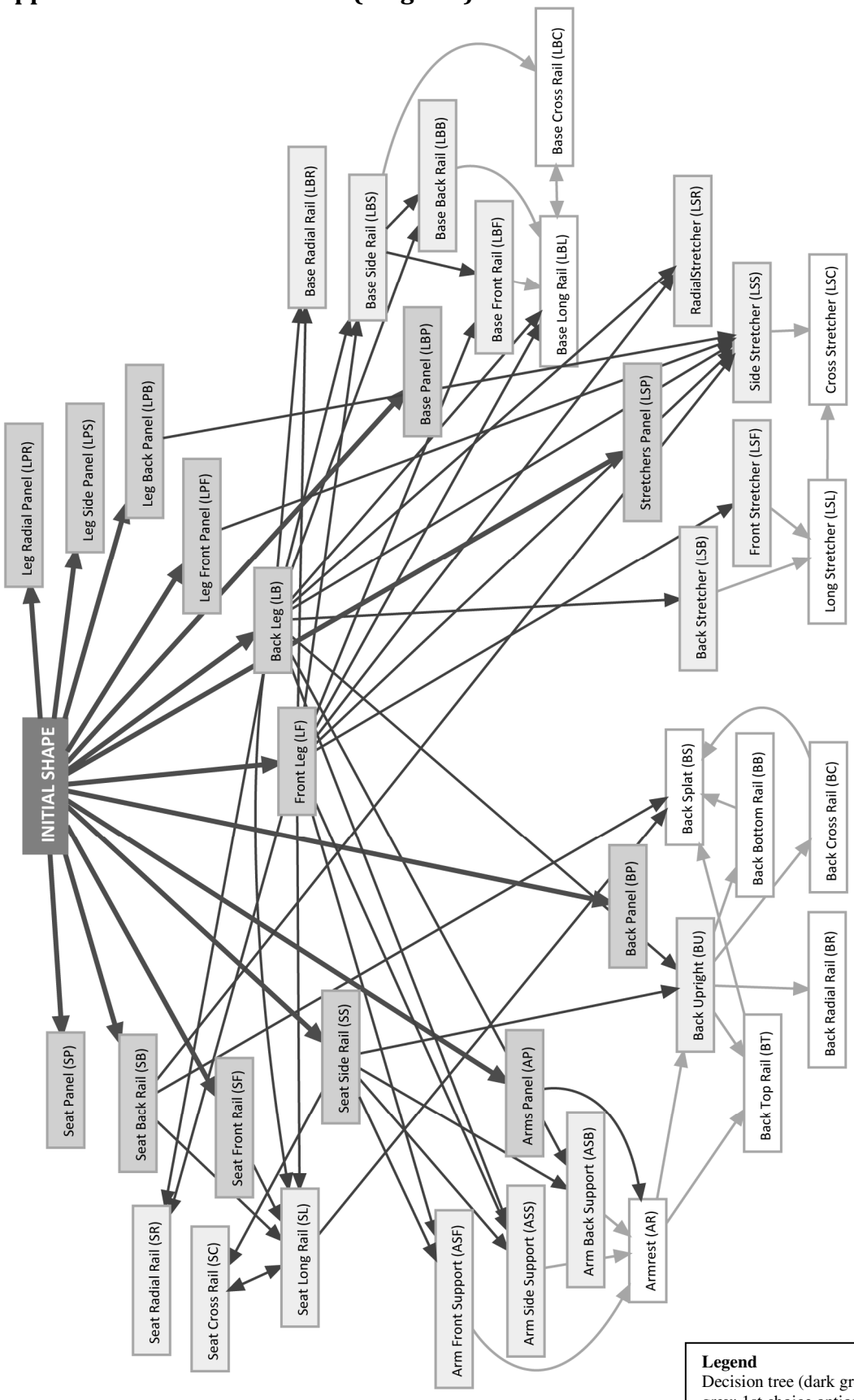
Appendix 4.B.5 Parts (diagram)



Appendix 4.B.6 Types (diagram)



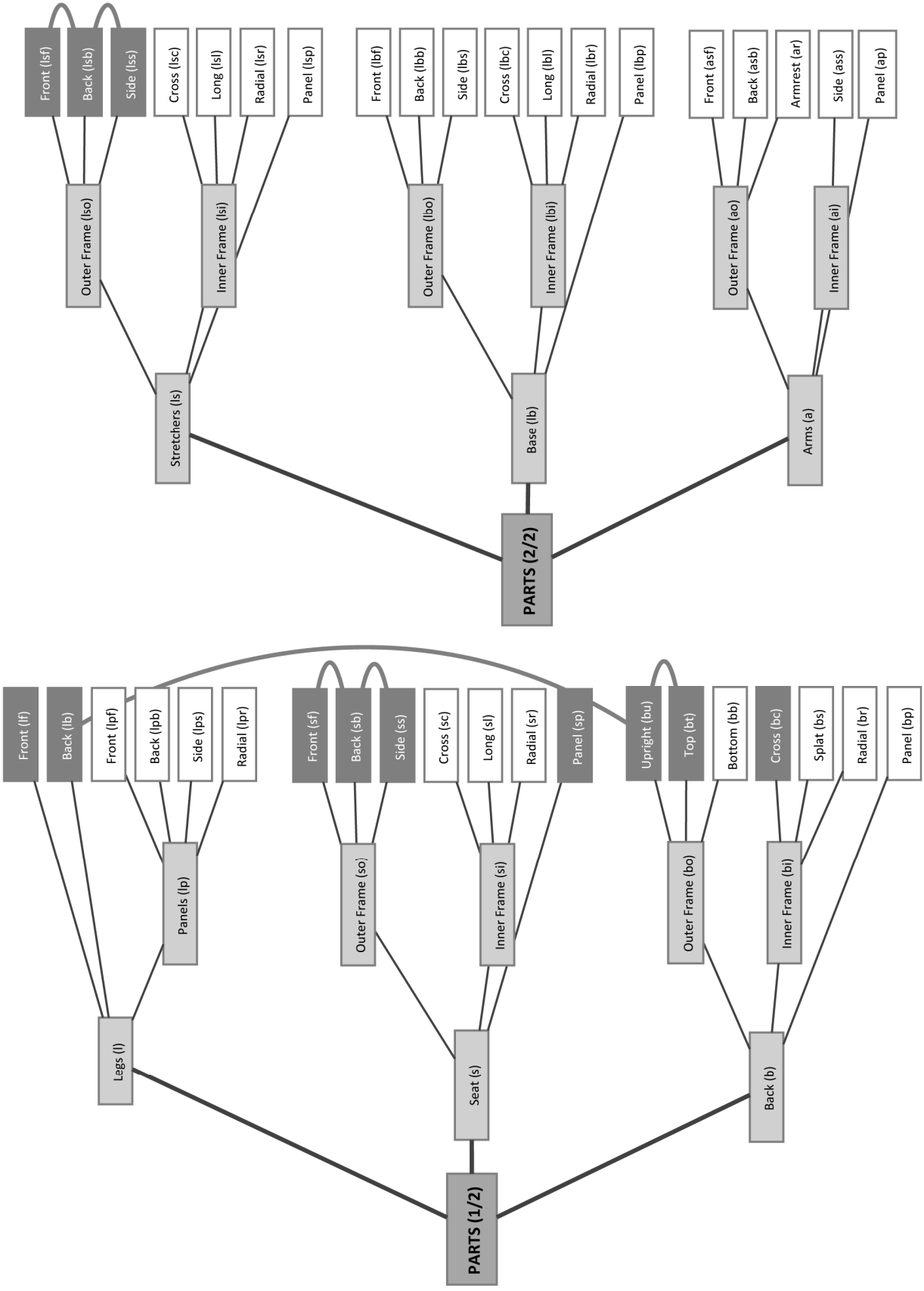
Appendix 4.B.7 Generation (diagram)



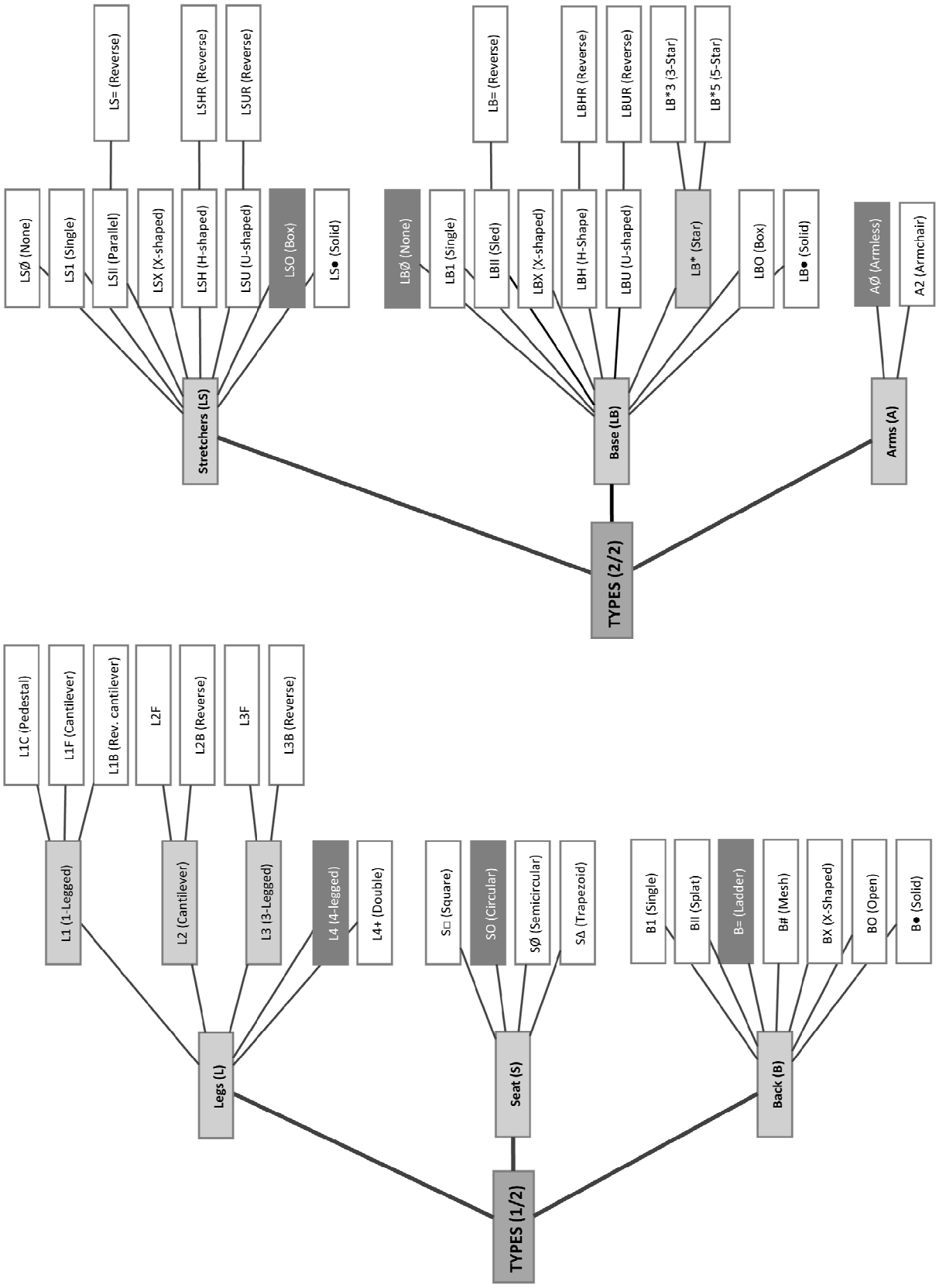
Legend
Decision tree (dark grey: initial shape; grey: 1st choice options; light grey: 2nd choice options; white: 3rd choice options)

Appendix 4.C Design 214 Ontology

Appendix 4.C.1 Parts (diagram)


PARTS (1/2)
Legs (l)
Front (lf)
Back (lb)
Panels (lp)
Front (lpf)
Back (lpb)
Side (lps)
Radial (lpr)
Seat (s)
Outer Frame (so)
Front (sf)
Back (sb)
Side (ss)
Inner Frame (si)
Cross (sc)
Long (sl)
Radial (sr)
Panel (sp)
Back (b)
Outer Frame (bo)
Upright (bu)
Top (bt)
Bottom (bb)
Inner Frame (bi)
Cross (bc)
Splat (bs)
Radial (br)
Panel (bp)
PARTS (2/2)
Stretchers (ls)
Outer Frame (lso)
Front (lsf)
Back (lsb)
Side (lss)
Inner Frame (lsi)
Cross (lsc)
Long (lsl)
Radial (lsr)
Panel (lsp)
Base (lb)
Outer Frame (lbo)
Front (lbf)
Back (lbb)
Side (lbs)
Inner Frame (lbi)
Cross (lbc)
Long (lbl)
Radial (lbr)
Panel (lbp)
Arms (a)
Outer Frame (ao)
Front (asf)
Back (asb)
Armrest (ar)
Inner Frame (ai)
Side (ass)
Panel (ap)

Appendix 4.C.2 Types (diagram)



Appendix 4.D Others

Appendix 4.D.1 Anthropometric Dimensions (comparison table)

			Kroemer & Grandjean 1997	Panero & Zelnik 1998 - I	Panero & Zelnik 1998 - II	Pheasant 2003	Tilley 2002	EN 1335-1: 2000 (Type A)	ANSI/HFES 100-2007	BIFMA G1 2013
Seat	**Height**	**min**	380	406	356	400	368	400	380	376
		max	540	432	508	N/A	480	510	560	512
	Depth	**min**	N/A	394	394	300	406	400	N/A	N/A
		max	N/A	457	406	435	508	420	430	415
	Width	**min**	400	457	432	350	406	400	450	489
		max	450	508	483	N/A	560	N/A	N/A	N/A
	Tilt Angle	**min**	N/A	0	0	5	0	2	0	0
		max	N/A	5	5	10	5	7	4	4
	Surface Depth	**min**	380	N/A	N/A	N/A	N/A	380	N/A	N/A
		max	420	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Back	**Height**	**min**	480	432	N/A	400	330	360	450	354
		max	500	610	N/A	650	635	N/A	N/A	N/A
	Height Spacing	**min**	N/A	0	N/A	100	0	N/A	N/A	N/A
		max	N/A	152	N/A	200	127	N/A	N/A	N/A
	Surface Height	**min**	N/A	N/A	152	N/A	N/A	220	N/A	N/A
		max	N/A	N/A	229	N/A	N/A	260	N/A	N/A
	Back-Seat Angle	**min**	104	105	95	N/A	90	N/A	90	90
		max	120	105	105	N/A	105	N/A	120	120
	Rake Angle	**min**	N/A	N/A	N/A	100	N/A	N/A	N/A	N/A
		max	N/A	N/A	N/A	110	N/A	N/A	N/A	N/A
	Width	**min**	N/A	254	N/A	N/A	N/A	360	360	360
		max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lumbar Height	**min**	N/A	280	192	N/A	178	170	150	150
		max	N/A	280	254	N/A	292	220	250	250
	Horizontal Radius	**min**	N/A	N/A	N/A	N/A	1000	400	N/A	N/A
		max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arms	**Height**	**min**	N/A	203	N/A	200	191	200	170	195
		max	N/A	254	N/A	250	254	250	270	289
	Depth	**min**	N/A	254	N/A	N/A	245	N/A	N/A	N/A
		max	N/A	305	N/A	350	305	N/A	N/A	N/A
	Depth Spacing	**min**	N/A	N/A	N/A	100	N/A	N/A	N/A	N/A
		max	N/A	N/A	N/A	100	N/A	N/A	N/A	N/A
	Length	**min**	N/A	N/A	N/A	N/A	N/A	200	N/A	N/A
		max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Depth Front Spacing	**min**	N/A	N/A	N/A	N/A	N/A	100	N/A	N/A
		max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Width	**min**	N/A	N/A	N/A	N/A	51	40	N/A	N/A
		max	N/A	N/A	N/A	N/A	89	N/A	N/A	N/A
	Width Spacing	**min**	N/A	N/A	N/A	500	483	460	460	493
		max	N/A	N/A	N/A	550	483	510	N/A	N/A
Base	**Diameter**	**min**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		max	N/A	N/A	N/A	N/A	N/A	390	N/A	N/A

Details	**Chair type**		Office	Executive	Office	General	Office	Office	Office	Office
	Population	**Country**	NM	USA	USA	British	USA	European	USA	USA
		Age	20-65	18-79	18-79	19-65	20-65	UNK	UNK	UNK
		Year	1976	1960-62	1960-62	1981	1974-79	UNK	1988	1988
		%	90	90	90	90	98	UNK	90	90
	Reference	**Pp.**	81-82	128, 129	127	75-78	50-51	18-19	UNK	UNK
		1st Ed.	1963	1979	1979	1986	1993	1980	1988	2002

Legend:

Version 1.1	Version 1.2	Units in millimeters and degrees

Multipurpose Chair Grammar

Appendixes

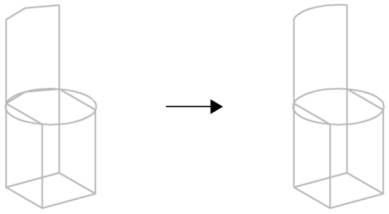
5

5 MULTIPUROPSE CHAIR GRAMMAR: APPENDIXES

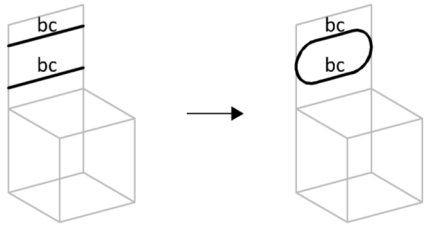
Appendix 5.A Multipurpose Chair Grammar

Appendix 5.A.1 Detail Rules

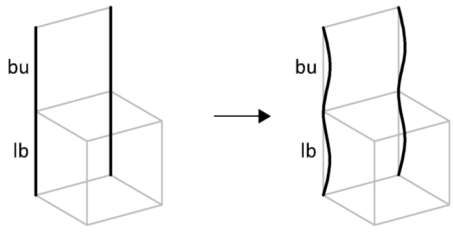
Detail Curvature 1 (DC1)



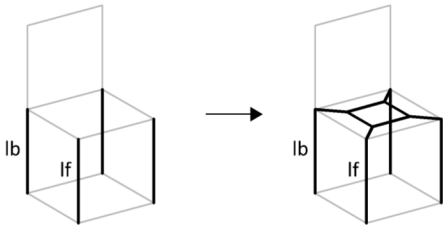
Detail Curvature 2 (DC2)



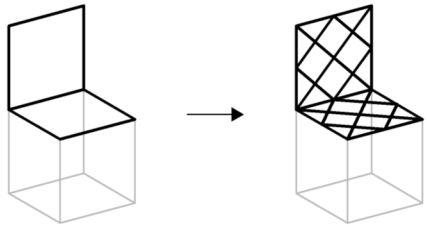
Detail Curvature 3 (DC3)



Detail Radial Box Rail (DRO)



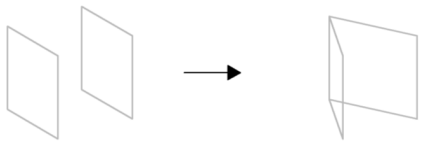
Detail Lattice (DL)



Appendix 5.B Meta-Grammar

Appendix 5.B.1 Meta-Rules

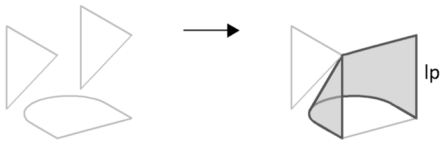
Leg Guides (LG)



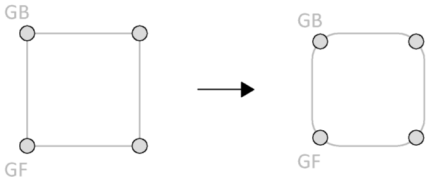
Leg (L)

Leg Panel 1 (LP1)

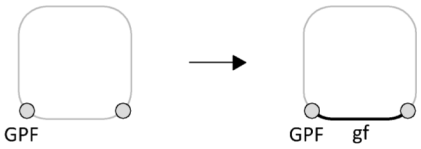
Leg Panel 2 (LP2)



Guides (G)

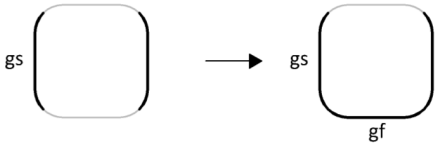


Front Rail 1 (GF1)



Front Rail 2 (GF2)

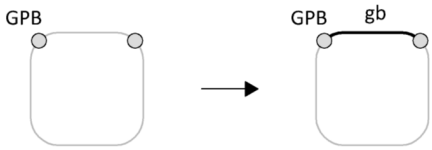
Front Rail 3 (GF3)



Front Rail 4 (GF4)

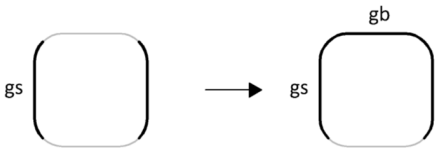
Front Rail 5 (GF5)

Back Rail 1 (GB1)



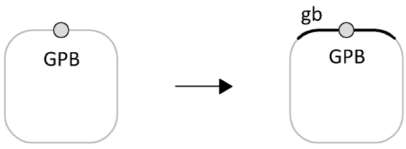
Back Rail 2 (GB2)

Back Rail 3 (GB3)

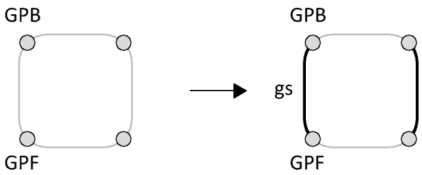


Back Rail 4 (GB4)

Back Rail 5 (GB5)

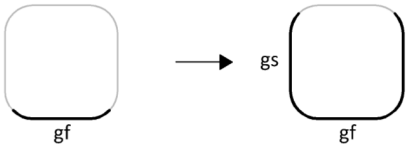


Side Rail 1 (GS1)

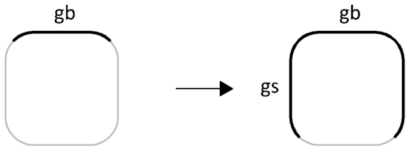


Side Rail 2 (GS2)

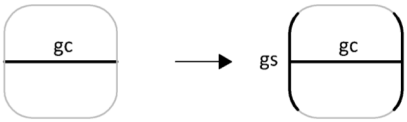
Side Rail 3 (GS3)



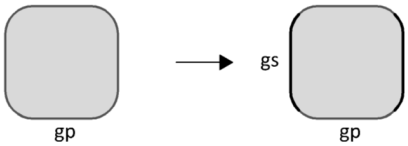
Side Rail 4 (GS4)



Side Rail 5 (GS5)



Side Rail 6 (GS6)



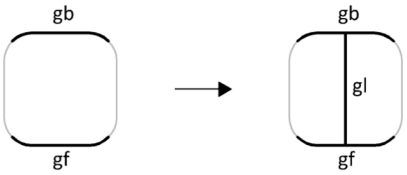
Cross Rail 1 (GC1)

Cross Rail 2 (GC2)

Cross Rail 3 (GC3)

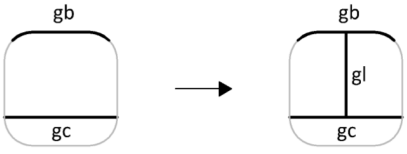
Cross Rail 4 (GC4)

Long Rail 1 (GL1)

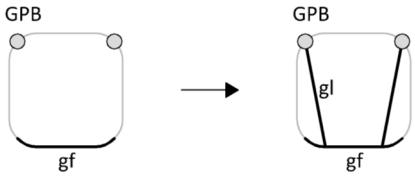


Long Rail 2 (GL2)

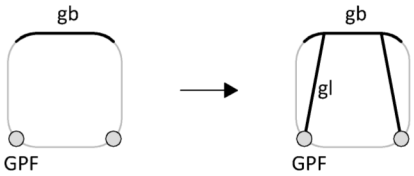
Long Rail 3 (GL3)



Long Rail 4 (GL4)

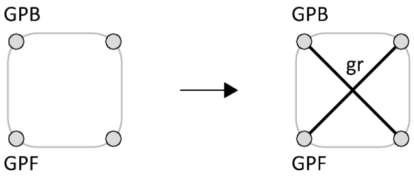


Long Rail 5 (GL5)

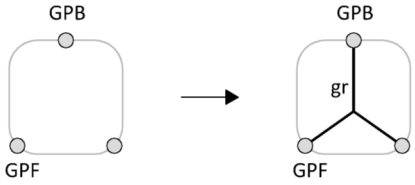


Long Rail 6 (GL6)

Radial Rail 1 (GR1)

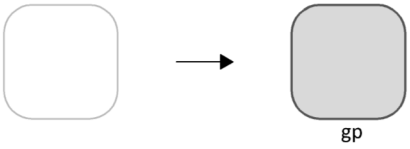


Radial Rail 2 (GR2)



Radial Rail 3 (GR3)

Panel (GP)



Appendix 5.B.2 Correspondence between Meta-Rules and Rules

Meta-rule	Rules	Implemented?
Leg Guides (LG)	Leg Guides (LG)	NO
Leg (L)	Leg Front (LF); Leg Back (LB)	YES
Leg Panel 1 (LP1)	Leg Panel Front 1 (LPF1); Leg Panel Back 1 (LPB1); Leg Panel Side (LPS); Leg Panel Radial (LPR)	YES
Leg Panel 2 (LP2)	Leg Panel Front 2 (LPF2); Leg Panel Back 2 (LPB2)	YES
Guides (G)	Seat Guides (SG); Back Guides (BG); Leg-Stretchers Guides (LSG); Leg-Base Guides (LBG); Arms Guides (AG)	YES
Front Rail 1 (GF1)	Seat Front 1 (SF1); Back Bottom (BB); Leg-Stretchers Front 1 (LSF1); Leg-Base Front 1 (LBF1)	YES
Front Rail 2 (GF2)	Seat Front 2 (SF2); Leg-Stretchers Front 2 (LSF2); Leg-Base Front 2 (LBF2)	NO
Front Rail 3 (GF3)	Leg-Base Front 3 (LBF3)	NO
Front Rail 4 (GF4)	Arm Support Front 1 (ASF1); Arm Support Front 2 (ASF2)	NO
Front Rail 5 (GF5)	Arm Support Front 3 (ASF3); Arm Support Front 4 (ASF4)	NO
Back Rail 1 (GB1)	Seat Back 1 (SB1); Back Top 1 (BT1); Leg-Stretchers Back 1 (LSB1); Leg-Base Back 1 (LBB1)	YES
Back Rail 2 (GB2)	Seat Back 2 (SB2); Back Top 2 (BT2); Back Top 3 (BT3); Leg-Stretchers Back 2 (LSB2); Leg-Base Back 2 (LBB2)	NO
Back Rail 3 (GB3)	Leg-Base Back 3 (LBB3)	NO
Back Rail 4 (GB4)	Arm Support Back 1 (ASB1); Arm Support Back 2 (ASB2)	NO
Back Rail 5 (GB5)	Arm Support Back 3 (ASB3); Arm Support Back 5 (ASB5); Back Top 4 (BT4)	NO
Side Rail 1 (GS1)	Seat Side 1 (SS1); Leg-Stretchers Side 1 (LSS1); Leg-Base Side 1 (LBS1); Leg-Base Side 2 (LBS2)	YES
Side Rail 2 (GS2)	Seat Side 2 (SS2); Seat Side 3 (SS3); Back Upright 1 (BU1); Back Upright 2 (BU2); Back Upright 3 (BU3); Leg-Base Side 3 (LBS3); Leg-Base Side 4 (LBS4); Arm Support Back 4 (ASB4)	NO
Side Rail 3 (GS3)	Leg-Stretchers Side 3 (LSS3); Armrest 2 (AR2)	NO
Side Rail 4 (GS4)	Leg-Stretchers Side 2 (LSS2); Armrest 3 (AR3)	NO
Side Rail 5 (GS5)	Armrest 1 (AR1)	NO
Side Rail 6 (GS6)	Armrest 4 (AR4)	NO
Cross Rail 1 (GC1)	Seat Cross 1 (SC1); Back Cross (BC); Leg-Stretchers Cross 1 (LSC1); Leg-Base Cross 1 (LBC1)	YES
Cross Rail 2 (GC2)	Seat Cross 2 (SC2); Leg-Stretchers Cross 2 (LSC2); Leg-Base Cross 2 (LBC2)	YES
Cross Rail 3 (GC3)	Arm Support Side 1 (ASS1)	NO
Cross Rail 4 (GC4)	Arm Support Side 2 (ASS2); Arm Support Side 3 (ASS3)	NO
Long Rail 1 (GL1)	Seat Long 1 (SL1); Back Splat 1 (BS1); Back Splat 2 (BS2); Leg-Stretchers Long 1 (LSL1); Leg-Base Long 1 (LBL1)	YES
Long Rail 2 (GL2)	Seat Long 2 (SL2); Back Splat 3 (BS3); Leg-Stretchers Long 2 (LSL2); Leg-Base Long 2 (LBL2)	YES
Long Rail 3 (GL3)	Seat Long 3 (SL3); Back Splat 4 (BS4); Leg-Stretchers Long 3 (LSL3); Leg-Base Long 3 (LBL3)	YES
Long Rail 4 (GL4)	Seat Long 4 (SL4); Leg-Stretchers Long 4 (LSL4); Leg-Base Long 4 (LBL4)	YES
Long Rail 5 (GL5)	Seat Long 5 (SL5); Leg-Stretchers Long 5 (LSL5); Leg-Base Long 5 (LBL5)	YES
Long Rail 6 (GL6)	Back Splat 5 (BS5)	YES
Radial Rail 1 (GR1)	Seat Radial 1 (SR1); Back Radial 1 (BR1); Leg-Stretchers Radial 1 (LSR1); Leg-Base Radial 1 (LBR1)	YES
Radial Rail 2 (GR2)	Seat Radial 2 (SR2); Back Radial 2 (BR2); Leg-Stretchers Radial 2 (LSR2); Leg-Base Radial 2 (LBR2)	YES
Radial Rail 3 (GR3)	Seat Radial 3 (SR3); Leg-Base Radial 3 (LBR3)	YES
Panel (GP)	Seat Panel (SP); Back Panel (BP); Leg-Stretchers Panel (LSP); Leg-Base Panel (LBP); Arms Panel (AP)	YES

Appendix 5.C Sub-Grammars

Appendix 5.C.1 Excel Spreadsheet

	DCG	JCG	TCG	ICG	DJCG	DJHG	SCG	MCG
Legs Guides (LG)	VX	VX	VX	VX	VX	VX	XX	VX
Leg Front (LF)	VV	VV	VV	VX	VV	VV	XX	VX
Width Spacing	[-10,1]	[-30,0]	N/A	[-100,1]	[-10,0]	[-30,1]	]1,100]	[-100,100]
Depth Spacing	[-35,-5]	[-40,0]	N/A	[-100,0]	[-35,-5]	[-40,0]	]0,100]	[-100,100]
Splay Angle	N/A	[0,10]	N/A	[-59,65]	0	[0,10]	[-100,-59[,]65,100]	[-100,100]
Rake Angle	N/A	[0,15]	N/A	[-100,70]	0	[0,15]	]70,100]	[-100,100]
Leg Back (LB)	VV	VV	VV	VX	VV	VV	XX	VX
Width Spacing	[-100,1]	[-30,12]	N/A	[-100,40]	[-30,1]	[-100,12]	]40,100]	[-100,100]
Depth Spacing	N/A	[-25,0]	N/A	[-100,0]	0	[-25,0]	]0,100]	[-100,100]
Splay Angle	N/A	[0,15]	8	[-27,65]	0	[0,15]	[-100,-27[,]65,100]	[-100,100]
Rake Angle	N/A	[15,33]	22	[-44,90]	[0,15]	[0,33]	[-100,-44[,]90,100]	[-100,100]
Leg Panel Front 1 (LPF1)	XX	XX	XX	VX	XX	XX	XX	VX
Leg Panel Front 2 (LPF2)	XX	XX	XX	VX	XX	XX	XX	VX
Leg Panel Back 1 (LPB1)	XX	XX	XX	XX	XX	XX	VX	VX
Leg Panel Back 2 (LPB2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg Panel Side (LPS)	XX	XX	XX	XX	XX	XX	VX	VX
Leg Panel Radial (LPR)	XX	XX	XX	XX	XX	XX	VX	VX
Seat Guides (SG)	VX	VX	VX	VX	VX	VX	XX	VX
Width	[470,560]	[406,489]	406	[406,560]	[470,489]	[406,560]	N/A	[406,560]
Depth	[409,473]	[406,453]	406	[406,489]	[409,453]	[406,473]	]489,508]	[406,508]
Height	[427,470]	[435,475]	434	[400,475]	[435,470]	[427,475]	[368,400[,]475,480]	[368,480]
Tilt Angle	[1,5]	[0,3]	N/A	[0,5]	[1,3]	[0,5]	N/A	[0,5]
Front Radius	[0,12]	[0,60]	43	[0,100]	[0,12]	[0,60]	N/A	[0,100]
Rear Radius	[0,100]	[0,80]	89	[0,100]	[0,80]	[0,100]	N/A	[0,100]
Taper Width	N/A	[0,15]	13	[0,74]	0	[0,15]	]74,100]	[0,100]
Seat Front 1 (SF1)	XX	VX	VV	VX	VX	VX	XX	VX
Seat Front 2 (SF2)	VV	VX	XX	VX	XX	VX	XX	VX
Seat Back 1 (SB1)	VX	VX	VV	VX	VX	VX	XX	VX
Seat Back 2 (SB2)	XX	VX	XX	VX	XX	VX	XX	VX
Seat Side 1 (SS1)	VX	VX	VV	VX	VX	VX	XX	VX
Seat Side 2 (SS2)	XX	XX	XX	VX	XX	XX	XX	VX
Seat Side 3 (SS3)	XX	XX	XX	VX	XX	XX	XX	VX
Seat Cross 1 (SC1)	XX	VX	XX	VX	XX	VX	XX	VX
Seat Cross 2 (SC2)	VX	XX	XX	XX	XX	VX	XX	VX
Depth Spacing	N/A	N/A	N/A	[1,90]	N/A	N/A	]90,99]	[1,99]
Seat Long 1 (SL1)	VX	VX	XX	VX	VX	VX	XX	VX
Seat Long 2 (SL2)	XX	XX	XX	XX	XX	XX	VX	VX
Seat Long 3 (SL3)	XX	XX	XX	XX	XX	XX	VX	VX
Seat Long 4 (SL4)	VX	XX	XX	XX	XX	VX	XX	VX
Seat Long 5 (SL5)	XX	XX	XX	XX	XX	XX	VX	VX
Width Front Spacing	[0,80]	[0,50]	N/A	[0,50]	[0,50]	[0,80]	]80,100]	[0,100]
Width Rear Spacing	[50,80]	[0,50]	N/A	[0,50]	50	[0,80]	]80,100]	[0,100]
Seat Radial 1 (SR1)	XX	VX	XX	VX	XX	VX	XX	VX
Seat Radial 2 (SR2)	XX	XX	XX	VX	XX	XX	XX	VX
Seat Radial 3 (SR3)	XX	XX	XX	VX	XX	XX	XX	VX
Number	N/A	N/A	N/A	[3,4]	N/A	N/A	]4,5]	[3,5]
Seat Panel (SP)	VV	VV	VV	VX	VV	VV	XX	VX
Back Guides (BG)	VX	VX	VX	VX	VX	VX	XX	VX
Height	[330,483]	[330,387]	406	[330,594]	[330,387]	[330,483]	]594,635]	[330,635]

Height Spacing	[0,195]	[0,200]	[101,200]	[0,190]	[0,195]	[0,200]	N/A	[0,200]
Back-Seat Angle	[93,96]	[94,96]	105	[92,105]	[94,96]	[93,96]	[90,92[	[90,105]
Top Radius	[0,12]	[0,30]	50	[0,100]	[0,12]	[0,30]	N/A	[0,100]
Bottom Radius	N/A	[0,50]	83	[0,85]	0	[0,50]	]85,100]	[0,100]
Width	N/A	[0,100]	N/A	N/A	50	[0,100]	N/A	[0,100]
Taper Width	N/A	N/A	-47	[-100,30]	N/A	N/A	]30,100]	[-100,100]
Back Upright 1 (BU1)	VX	VX	VV	VX	VX	VX	XX	VX
Back Upright 2 (BU2)	XX	XX	XX	VX	XX	XX	XX	VX
Back Upright 3 (BU3)	XX	XX	XX	VX	XX	XX	XX	VX
Height	[50,100]	[50,100]	N/A	[70,100]	[50,100]	[50,100]	[1,50[	[1,100]
Back Top 1 (BT1)	VX	VX	VV	VX	VX	VX	XX	VX
Back Top 2 (BT2)	XX	XX	XX	VX	XX	XX	XX	VX
Back Top 3 (BT3)	XX	VX	XX	VX	XX	VX	XX	VX
Back Top 4 (BT4)	VX	XX	XX	XX	XX	VX	XX	VX
Back Bottom (BB)	XX	XX	VX	XX	XX	XX	XX	VX
Back Cross (BC)	XX	XX	VX	VX	XX	XX	XX	VX
Height	N/A	N/A	[75,99]	[50,99]	N/A	N/A	[1,50[	[1,99]
Back Splat 1 (BS1)	XX	XX	XX	XX	XX	XX	VX	VX
Back Splat 2 (BS2)	XX	XX	VX	VX	XX	XX	XX	VX
Back Splat 3 (BS3)	XX	XX	XX	XX	XX	XX	VX	VX
Back Splat 4 (BS4)	XX	XX	XX	XX	XX	XX	VX	VX
Back Splat 5 (BS5)	XX	XX	XX	VX	XX	XX	XX	VX
Width Top Spacing	N/A	N/A	[50,100]	[18,50]	N/A	N/A	[0,18[,]50,100]	[0,100]
Width Bottom Spacing	N/A	N/A	[13,38]	[0,80]	N/A	N/A	]80,100]	[0,100]
Back Radial 1 (BR1)	XX	XX	XX	VX	XX	XX	XX	VX
Back Radial 2 (BR2)	XX	XX	XX	XX	XX	XX	VX	VX
Back Panel (BP)	VX	VX	VX	VX	VX	VX	XX	VX
Leg-Stretchers Guides (LSG)	XX	VX	VX	VX	XX	VX	XX	VX
Height	N/A	[50,75]	77	[5,85]	50	[50,75]	[1,5[,]85,99]	[1,99]
Tilt Angle	N/A	N/A	N/A	[-100,85]	N/A	N/A	]85,100]	[-100,100]
Front Radius	N/A	N/A	48	[0,48]	N/A	N/A	]48,100]	[0,100]
Rear Radius	N/A	N/A	58	[0,58]	N/A	N/A	]58,100]	[0,100]
Leg-Stretchers Front 1 (LSF1)	XX	XX	VV	VX	XX	XX	XX	VX
Leg-Stretchers Front 2 (LSF2)	XX	XX	XX	VX	XX	XX	XX	VX
Height	N/A	N/A	N/A	[0,25]	N/A	N/A	[-100,0[,]25,100]	[-100,100]
Leg-Stretchers Back 1 (LSB1)	XX	XX	VV	VX	XX	XX	XX	VX
Leg-Stretchers Back 2 (LSB2)	XX	VX	XX	VX	XX	VX	XX	VX
Height	N/A	[-15,0]	N/A	[-25,25]	0	[-15,0]	[-100,-25[,]25,100]	[-100,100]
Leg-Stretchers Side 1 (LSS1)	XX	VX	VV	VX	XX	VX	XX	VX
Leg-Stretchers Side 2 (LSS2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Stretchers Side 3 (LSS3)	XX	XX	XX	VX	XX	XX	XX	VX
Leg-Stretchers Cross 1 (LSC1)	XX	VX	XX	VX	XX	VX	XX	VX
Leg-Stretchers Cross 2 (LSC2)	XX	XX	XX	XX	XX	XX	VX	VX
Depth Spacing	N/A	[25,50]	N/A	[1,50]	50	[25,50]	]50,99]	[1,99]
Leg-Stretchers Long 1 (LSL1)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Stretchers Long 2 (LSL2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Stretchers Long 3 (LSL3)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Stretchers Long 4 (LSL4)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Stretchers Long 5 (LSL5)	XX	XX	XX	XX	XX	XX	VX	VX
Width Front Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Width Rear Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Leg-Stretchers Radial 1 (LSR1)	XX	XX	XX	VX	XX	XX	XX	VX
Leg-Stretchers Radial 2 (LSR2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Stretchers Panel (LSP)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Guides (LBG)	VX	XX	XX	VX	XX	VX	XX	VX

Width	N/A	N/A	N/A	[70,100]	N/A	N/A	[1,70[	[1,100]
Depth	[98,100]	N/A	N/A	[59,100]	100	[98,100]	[1,59[	[1,100]
Front Radius	N/A	N/A	N/A	[0,100]	N/A	N/A	N/A	[0,100]
Rear Radius	N/A	N/A	N/A	[0,100]	N/A	N/A	N/A	[0,100]
Leg-Base Front 1 (LBF1)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Front 2 (LBF2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Front 3 (LBF3)	XX	XX	XX	VX	XX	XX	XX	VX
Leg-Base Back 1 (LBB1)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Back 2 (LBB2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Back 3 (LBB3)	XX	XX	XX	VX	XX	XX	XX	VX
Leg-Base Side 1 (LBS1)	VX	XX	XX	VX	XX	VX	XX	VX
Leg-Base Side 2 (LBS2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Side 3 (LBS3)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Side 4 (LBS4)	XX	XX	XX	VX	XX	XX	XX	VX
Leg-Base Cross 1 (LBC1)	XX	XX	XX	VX	XX	XX	XX	VX
Leg-Base Cross 2 (LBC2)	XX	XX	XX	XX	XX	XX	VX	VX
Depth Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[1,50[,]50,99]	[1,99]
Leg-Base Long 1 (LBL1)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Long 2 (LBL2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Long 3 (LBL3)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Long 4 (LBL4)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Long 5 (LBL5)	XX	XX	XX	XX	XX	XX	VX	VX
Width Front Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Width Rear Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Leg-Base Radial 1 (LBR1)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Radial 2 (LBR2)	XX	XX	XX	XX	XX	XX	VX	VX
Leg-Base Radial 3 (LBR3)	XX	XX	XX	VX	XX	XX	XX	VX
Number	N/A	N/A	N/A	[3,4]	N/A	N/A	]4,5]	[3,5]
Leg-Base Panel (LBP)	XX	XX	XX	VX	XX	XX	XX	VX
Arms Guides (AG)	VX	VX	XX	VX	VX	VX	XX	VX
Height	[191,223]	[223,254]	N/A	[191,241]	223	[191,254]	N/A	[191,254]
Depth	[66,100]	[20,100]	N/A	[0,100]	[66,100]	[20,100]	N/A	[0,100]
Depth Rear Spacing	[0,18]	[0,10]	N/A	[0,80]	[0,10]	[0,18]	]80,100]	[0,100]
Tilt Angle	N/A	[-27,0]	N/A	[-53,20]	0	[-27,0]	[-100,-53[,]20,100]	[-100,100]
Front Radius	N/A	N/A	N/A	[0,41]	N/A	N/A	]41,100]	[0,100]
Rear Radius	N/A	N/A	N/A	[0,30]	N/A	N/A	]30,100]	[0,100]
Arm Support Front 1 (ASF1)	XX	XX	XX	VX	XX	XX	XX	VX
Arm Support Front 2 (ASF2)	XX	XX	XX	XX	XX	XX	VX	VX
Arm Support Front 3 (ASF3)	VX	XX	XX	VX	XX	VX	XX	VX
Arm Support Front 4 (ASF4)	XX	XX	XX	XX	XX	XX	VX	VX
Arm Support Back 1 (ASB1)	XX	XX	XX	XX	XX	XX	VX	VX
Arm Support Back 2 (ASB2)	XX	XX	XX	XX	XX	XX	VX	VX
Arm Support Back 3 (ASB3)	VX	XX	XX	VX	XX	VX	XX	VX
Arm Support Back 4 (ASB4)	VX	XX	XX	XX	XX	VX	XX	VX
Arm Support Back 5 (ASB5)	XX	XX	XX	XX	XX	XX	VX	VX
Armrest 1 (AR1)	XX	VX	XX	VX	XX	VX	XX	VX
Armrest 2 (AR2)	VX	XX	XX	VX	XX	VX	XX	VX
Armrest 3 (AR3)	XX	XX	XX	XX	XX	XX	VX	VX
Armrest 4 (AR4)	XX	XX	XX	VX	XX	XX	XX	VX
Arm Support Side 1 (ASS1)	XX	XX	XX	VX	XX	XX	XX	VX
Arm Support Side 2 (ASS2)	XX	XX	XX	XX	XX	XX	VX	VX
Arm Support Side 3 (ASS3)	XX	VX	XX	VX	XX	VX	XX	VX
Depth Top Spacing	N/A	[46,50]	N/A	[0,50]	50	[46,50]	]50,100]	[0,100]
Depth Bottom Spacing	N/A	N/A	N/A	[50,100]	N/A	N/A	[0,50[	[0,100]
Arm Panel (AP)	XX	XX	XX	VX	XX	XX	XX	VX

Round Section (MSF-SR)	XX	VX	VX	VX	XX	VX	XX	VX
Diameter	N/A	[20,35]	[17,33]	[8,60]	30	[20,35]	[1,8[,]60,280]	[1,280]
Taper Ratio	N/A	[80,100]	[60,84]	[50,100]	100	[80,100]	[1,50[	[1,100]
Square Section (MSF-SS)	VV	VX	VX	VX	VX	VX	XX	VX
Width	[20,120]	[10,40]	[27,30]	[10,120]	[20,40]	[10,120]	[1,10[,]120,280]	[1,280]
Length	[20,100]	[20,50]	[30,38]	[4,76]	[20,50]	[20,100]	[1,4[,]100,280]	[1,280]
Taper Ratio	N/A	[80,100]	[60,84]	[50,100]	100	[80,100]	[1,50[	[1,100]
Panels (MSP)	VV	VV	VV	VX	VV	VV	XX	VX
Thickness	[10,40]	[3,12]	[5,10]	[2,80]	[10,12]	[3,40]	[1,2[,]80,100]	[1,100]
Termination (T)	VV	VV	VV	VV	VV	VV	XX	VX

TOTALS

	Specific				**Common**	**Hybrid**	**Synthetic**	**Generic**
	DCG	**JCG**	**TCG**	**ICG**	**DJCG**	**DJHG**	**SCG**	**MCG**
RULES VV	**7**	**5**	**13**	**1**	**5**	**5**	**N/A**	**N/A**
RULES VX	**19**	**24**	**10**	**61**	**12**	**33**	**N/A**	**N/A**
RULES VX/VV	**26**	**29**	**23**	**62**	**17**	**38**	**41**	**108**
%	**24**	**27**	**21**	**57**	**16**	**35**	**38**	**100**
Legs	3	3	3	5	3	3	4	9
Seat	8	10	5	14	6	12	3	19
Back	5	5	7	12	4	6	4	18
Stretchers	0	4	4	9	0	4	9	18
Base	2	0	0	8	0	2	14	22
Arms	5	3	0	10	1	7	7	18
Solid Mode	2	3	3	3	2	3	0	3
Termination	1	1	1	1	1	1	0	1
PARAMETERS VV	**0**	**0**	**16**	**0**	**18**	**0**	**0**	**0**
PARAMETERS VX (range)	**23**	**38**	**10**	**55**	**21**	**39**	**50**	**61**
PARAMETERS VX/VV	**23**	**38**	**26**	**55**	**39**	**39**	**50**	**61**
%	**38**	**62**	**43**	**90**	**64**	**64**	**82**	**100**
Legs	14	14	14	12	14	14	13	8
Seat	22	20	25	16	24	18	27	11
Back	24	24	22	17	25	23	25	11
Stretchers	27	23	23	18	27	23	18	9
Base	28	30	30	22	30	28	16	8
Arms	21	23	26	16	25	19	19	8
Solid Mode	7	6	6	6	7	6	9	6
Termination	0	0	0	0	0	0	0	0

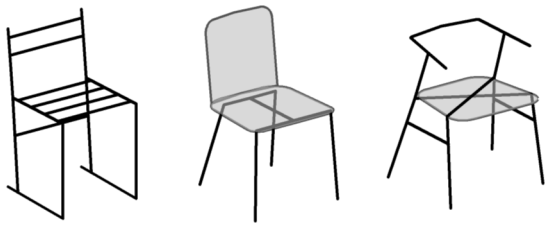
Appendix 5.D Designs

Appendix 5.D.1 JCG

JC Jasper Corpus

JC1/ICB22 Ply | **JC2** Basel | **JC3** Bac | **JC4** HAL | **JC5** Lightwood

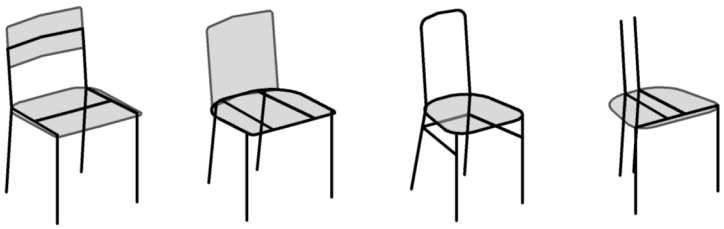
JE Jasper Existing **JN** Jasper New



ME6 La Tourette | **JN7** | **JN8**

Appendix 5.D.2 DJCG & DJHG

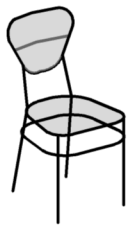
DJC Daciano-Jasper Common **DJH** Daciano-Jasper Hybrid



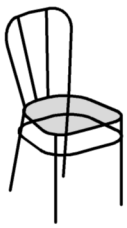
DJC1 | **DJC2** | **DJH1** | **DJH2**

Appendix 5.D.3 TCG

TC Thonet Corpus

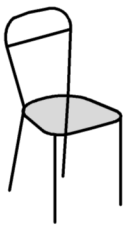


TC2 215



TC3 218

TE Thonet Existing



TE3 Muji No. 14

TN Thonet New

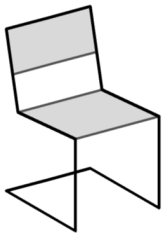
TN5

TN6

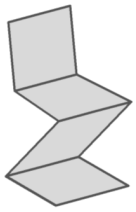
Appendix 5.D.4 ICG

IC Iconic Corpus

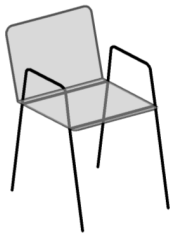
ICA1/TC1 214



ICA2 S33

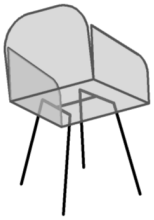


ICA3 Zig-Zag



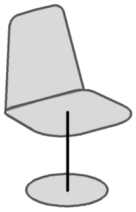
ICA4 Landi

ICA5 DCW



ICA6 DAX

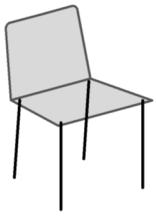
ICA7 DKR



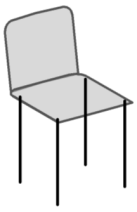
ICA8 Tulip

ICA9 Supperleggera

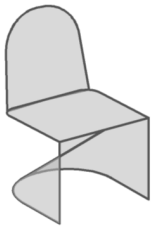
ICA10 Polyside



ICA11 Bofinger



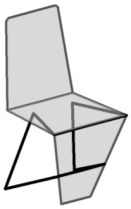
ICA12 Universale



ICA13 Panton

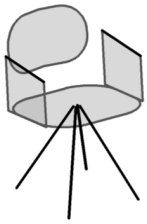
ICB14 Wishbone

ICB15 Antelope



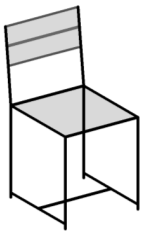
ICB16 Bellevue

ICB17 Ant

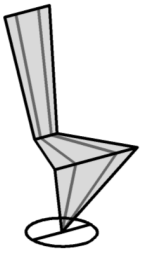


ICB18 Swag Leg

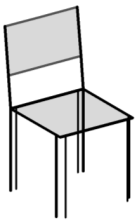
ICB19 PK9



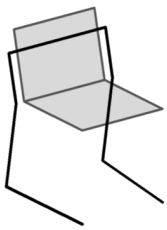
ICB20 Spaghetti



ICB21 S



ICB23 RCP2

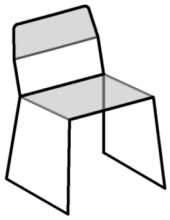


ICB24 Magic

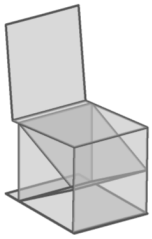
ICB25 Chair_One

IPCB26 Gonçalo

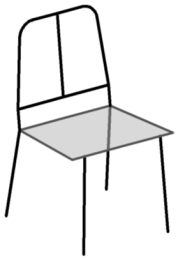
IE Iconic Existing



IE27 Omkstak

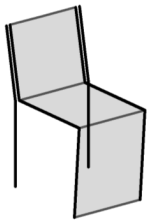


IE28 Wiggle

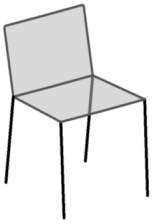


IE29 Queen Anne

IE30 Loius 20



IE31 FPE



IE32 Air-Chair

The ChairDNA Design Tool

Appendixes

6

6 THE CHAIRDNA DESIGN TOOL: APPENDIXES

Appendix 6.A ChairDNA 1.2 Package

Appendix 6.A.1 ChairDNA 1.2 Zip File

Available at: https://chairdna.wordpress.com/download

Appendix 6.A.2 ChairDNA 1.2 Tutorial

Available at: https://chairdna.wordpress.com/tutorial

Appendix 6.A.3 ChairDNA 1.2 Installation Guide

Installation Guide

This is the guide for installation of ChairDNA 1.2 for Rhino.

Requirements

1. Windows 64-bit

2. Rhinoceros 5

Install ChairDNA

1. Extract the file **ChairDNA12.zip** to a folder

2. Open **Rhinoceros 5**

3. Open the file **ChairDNA12.exe**

4. The **ChairDNA12** folder also includes a folder called **Templates**. This is a library containing 26 iconic chairs, which can be opened in ChairDNA.

Appendix 6.A.4 ChairDNA 1.2 Quick Start Guide

Quick Start Guide

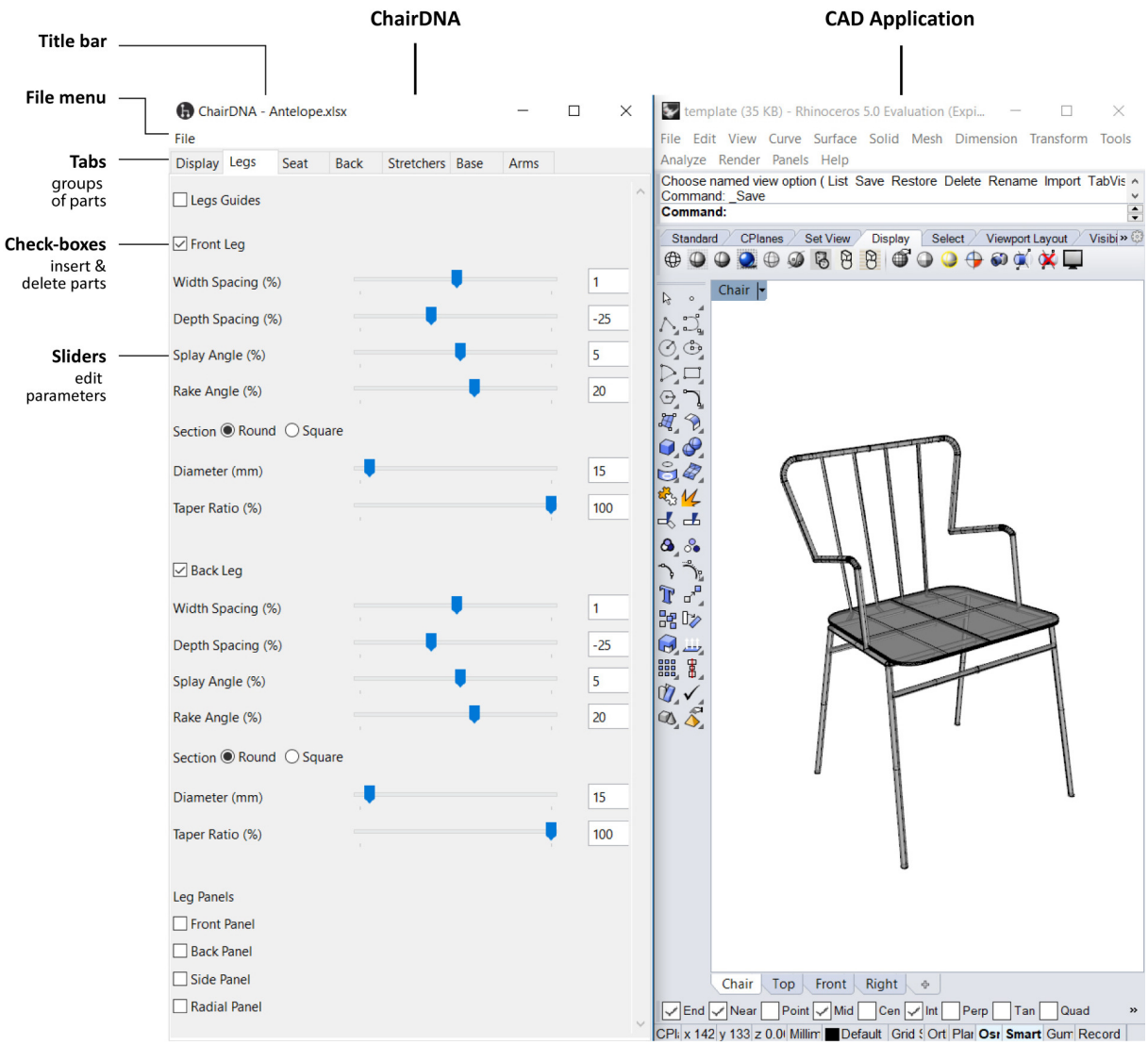
ChairDNA 1.2 is a program that allows the generation of multipurpose chairs.

The program lets you generate symmetrical chairs of many different types, while ensuring they obey correct anthropometric standards. Chairs may be generated by adding parts, step-by-step, until a desired solution is reached, or by editing pre-defined templates (loaded from a library or randomly generated).

Interface

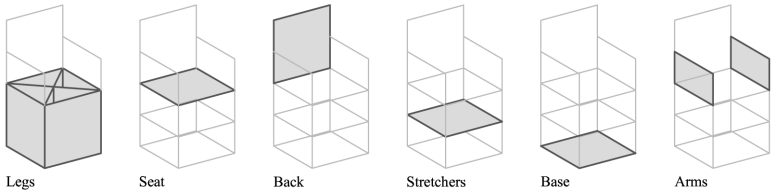
The *ChairDNA* tool interacts with three possible *CAD applications*: Rhinoceros 3D, AutoCAD or SketchUp.

In the *ChairDNA* interface you can generate chairs by adding/deleting parts and editing shape parameters. In the *CAD application*, you automatically visualize the generated model of the chair. In addition, you may edit visualization options, but you should not edit the generated shapes during the usage of *ChairDNA*.



Tabs

Apart from the Display tab, the other six correspond to the main functional areas of the chair: *Legs*, *Seat*, *Back*, *Stretchers*, *Base*, and *Arms*.



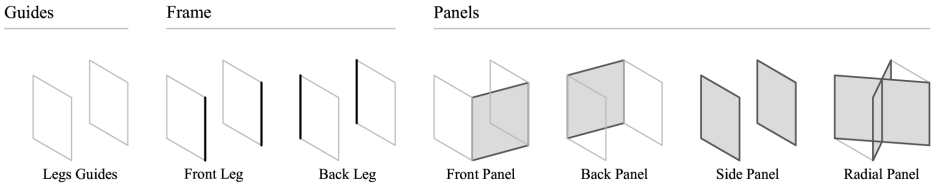
Check-boxes

When one check-box is checked the corresponding part of the chair is placed, otherwise the part is deleted.

There are three kinds of parts:

- *Guides*: the bounding perimeter of the area depicted by grey lines;
- *Frame*: the linear elements depicted by dark lines;
- *Panels*: the planar elements depicted by shaded grey planes.

Example: in the *Legs* tab, the user can add/delete one of the six parts represented below:



At the beginning, only some check-boxes are enabled to be checked; others will become enabled when the parts are inserted.

Example: in the Seat tab, the *Seat Cross Rail* only becomes enabled when the *Seat Side Rail* is checked.

Sliders

Whenever a part is placed, its shape can be edited by manipulating sliders or inserting values in the text-field.

Example: By manipulating the *Legs* parameters, one can obtain chairs with four, three, two, or one legs.

Display

Guides: turn several guides on or off.

Solid mode: manage the appearance of the model, between wireframe and solid.

File

New: resets *ChairDNA* to the initial state.

Open: imports a design whose parameters are stored in an Excel file. The user may open a pre-defined chair from the program library or open a chair that was previously saved.

Save/Save as: exports a design to an Excel file, which stores all the parameters of the current design.

Random: generates a random design. If the word ERROR appears in the title bar, it means that some constrains were violated. In that case, repeat the process.

Exit: quits *ChairDNA*

Appendix 6.B ChairDNA 1.2 Implementation

Appendix 6.B.1 ChairDNA Screenshots

Antelope Chair

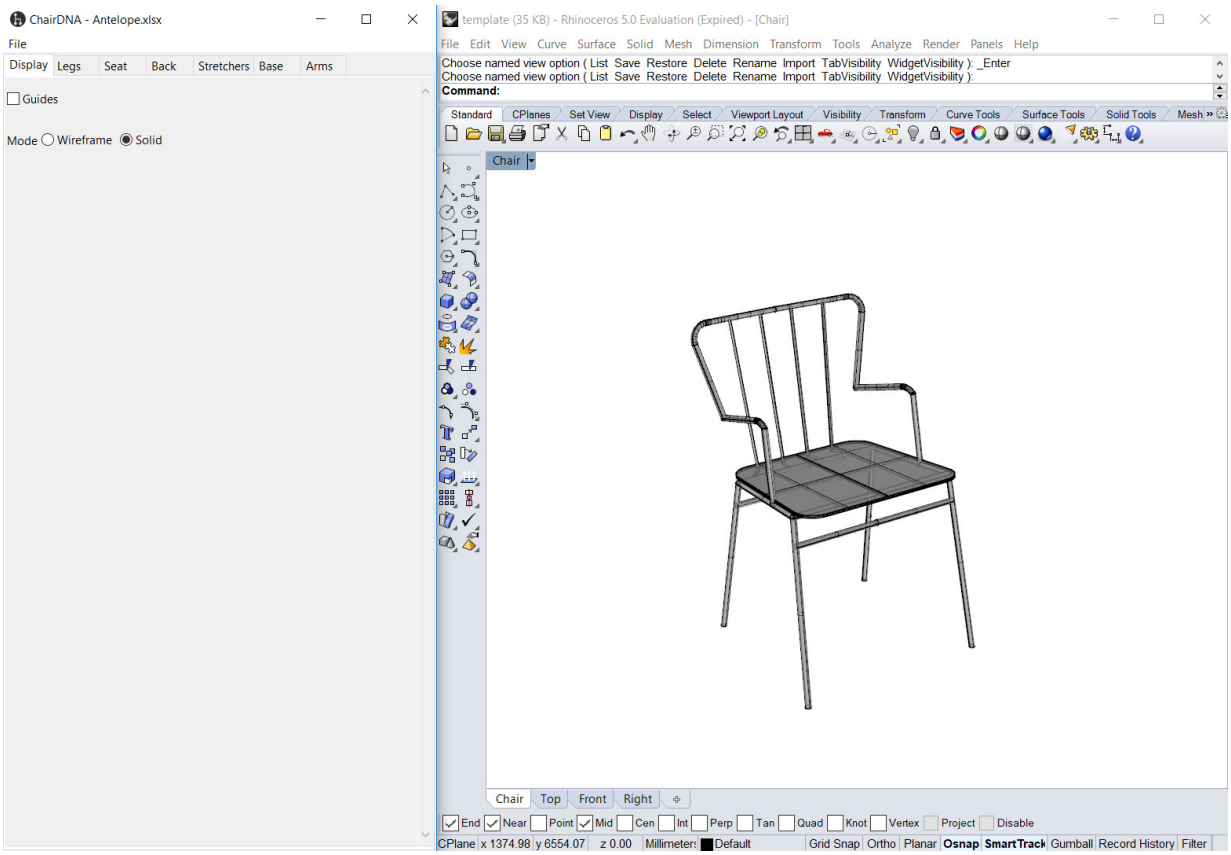


Fig. 6.1 ChairDNA screenshot (Display tab)

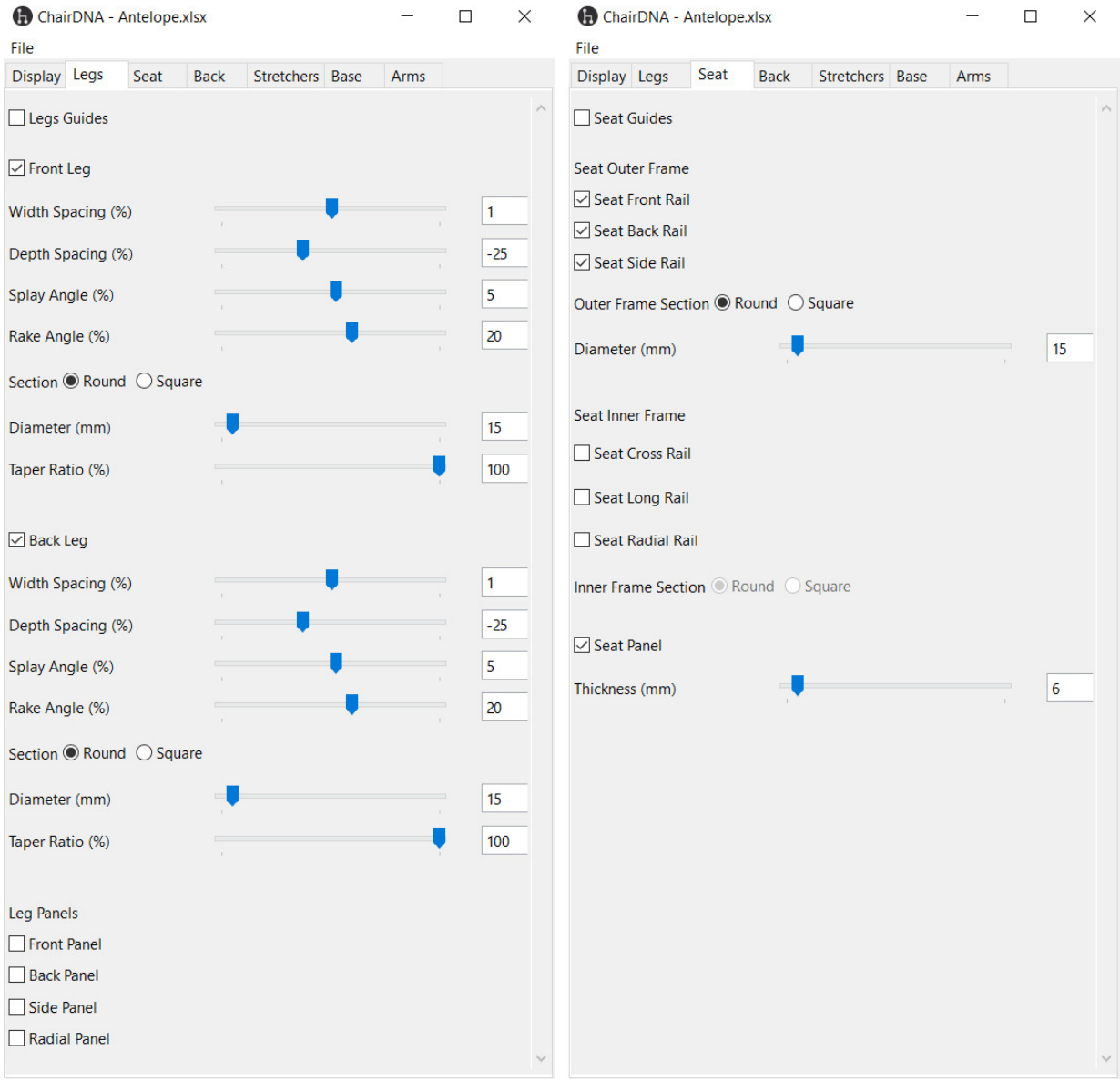


Fig. 6.2 Screenshot of ChairDNA (left: Legs tab, right: Seat tab)

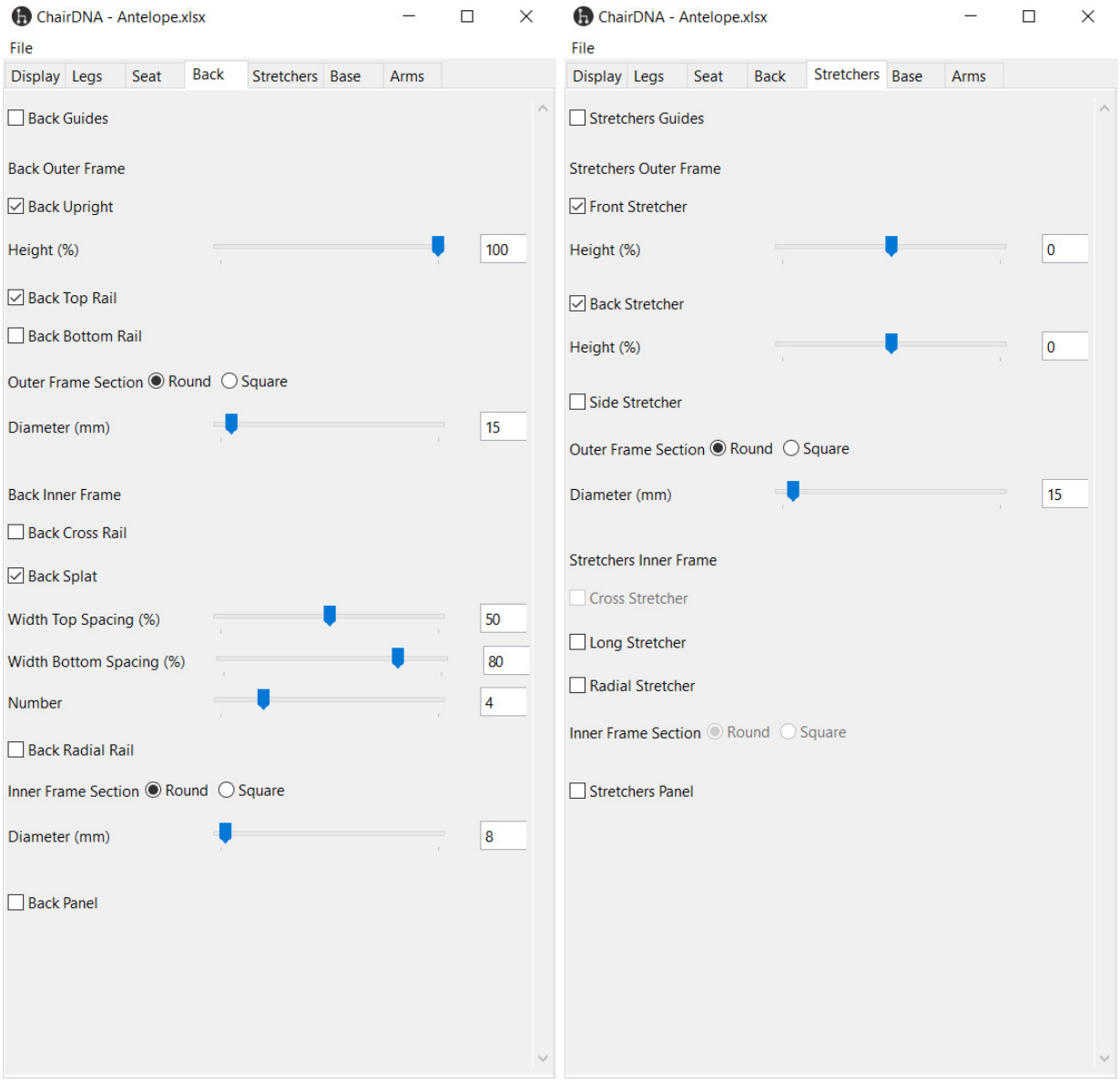


Fig. 6.3 Screenshot of ChairDNA (left: Back tab, right: Stretchers tab)

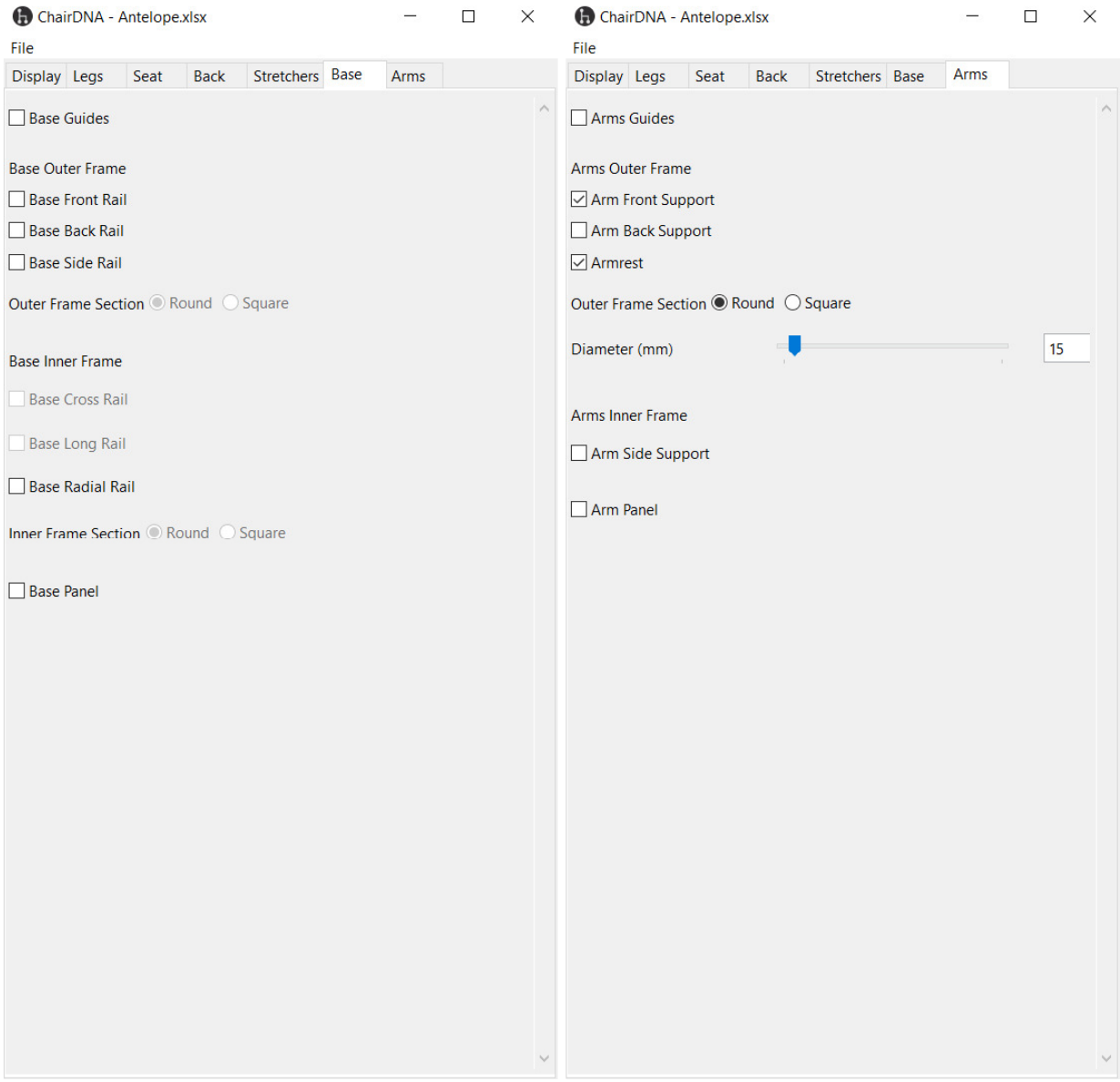


Fig. 6.4 Screenshot of ChairDNA (left: Base tab, right: Arms tab)

Appendix 6.B.2 ChairDNA Application Icon

ChairDNA Application Icon

ChairDNA Logo

Appendix 6.B.3 Correspondence between MCG and ChairDNA 1.2

MCG	ChairDNA
N/A	Guides
N/A	Mode
Legs Guides (LG)	Legs Guides
Leg Front (LF)	Front Leg
Width Spacing	Width Spacing
Depth Spacing	Depth Spacing
Splay Angle	Splay Angle
Rake Angle	Rake Angle
N/A	Section
N/A	Diameter
N/A	Width
N/A	Depth
N/A	Taper Ratio
Leg Back (LB)	Back Leg
Width Spacing	Width Spacing
Depth Spacing	Depth Spacing
Splay Angle	Splay Angle
Rake Angle	Rake Angle
N/A	Section
N/A	Diameter
N/A	Width
N/A	Depth
N/A	Taper Ratio
Leg Panel Front 1 (LPF1)	Leg Front Panel
Leg Panel Front 2 (LPF2)	N/A
Leg Panel Back 1 (LPB1)	Leg Back Panel
Leg Panel Back 2 (LPB2)	N/A
Leg Panel Side (LPS)	Leg Side Panel
Leg Panel Radial (LPR)	Leg Radial Panel
N/A	Thickness
Seat Guides (SG)	Seat Guides
Width	Width
Depth	Depth
Height	Height
Tilt Angle	Tilt Angle
Front Radius	Front Radius
Rear Radius	Rear Radius
Taper Width	Taper Width
Seat Front 1 (SF1)	Seat Front Rail
Seat Front 2 (SF2)	N/A
Seat Back 1 (SB1)	Seat Back Rail
Seat Back 2 (SB2)	N/A
Seat Side 1 (SS1)	Seat Side Rail
Seat Side 2 (SS2)	N/A
Seat Side 3 (SS3)	N/A
N/A	Outer Frame Section
N/A	Diameter
N/A	Width/Depth
N/A	Height
Seat Cross 1 (SC1)	Seat Cross Rail
Seat Cross 2 (SC2)	N/A

MCG	ChairDNA
Depth Spacing	Depth Spacing
N/A	Number
Seat Long 1 (SL1)	Seat Long Rail
Seat Long 2 (SL2)	N/A
Seat Long 3 (SL3)	N/A
Seat Long 4 (SL4)	N/A
Seat Long 5 (SL5)	N/A
Width Front Spacing	Width Front Spacing
Width Rear Spacing	Width Rear Spacing
N/A	Number
Seat Radial 1 (SR1)	Seat Radial Rail
Seat Radial 2 (SR2)	N/A
Seat Radial 3 (SR3)	N/A
Number	Number
N/A	Inner Frame Section
N/A	Diameter
N/A	Width/Depth
N/A	Height
Seat Panel (SP)	Seat Panel
N/A	Thickness
Back Guides (BG)	Back Guides
Height	Height
Height Spacing	Height Spacing
Back-Seat Angle	Back-Seat Angle
Top Radius	Top Radius
Bottom Radius	Bottom Radius
Width	Width
Taper Width	Taper Width
Back Upright 1 (BU1)	Back Upright
Back Upright 2 (BU2)	N/A
Back Upright 3 (BU3)	N/A
Height	Height
Back Top 1 (BT1)	Back Top Rail
Back Top 2 (BT2)	N/A
Back Top 3 (BT3)	N/A
Back Top 4 (BT4)	N/A
Back Bottom (BB)	Back Bottom Rail
N/A	Outer Frame Section
N/A	Diameter
N/A	Width/Height
N/A	Depth
Back Cross (BC)	Back Cross Rail
Height	Height
N/A	Number
Back Splat 1 (BS1)	Back Splat
Back Splat 2 (BS2)	N/A
Back Splat 3 (BS3)	N/A
Back Splat 4 (BS4)	N/A
Back Splat 5 (BS5)	N/A
Width Top Spacing	Width Top Spacing
Width Bottom Spacing	Width Bottom Spacing

MCG	ChairDNA
N/A	Number
Back Radial 1 (BR1)	Back Radial Rail
Back Radial 2 (BR2)	N/A
N/A	Inner Frame Section
N/A	Diameter
N/A	Width/Height
N/A	Depth
Back Panel (BP)	Back Panel
N/A	Thickness
Leg-Stretchers Guides (LSG)	Stretchers Guides
Height	Height
Tilt Angle	Tilt Angle
Front Radius	Front Radius
Rear Radius	Rear Radius
Leg-Stretchers Front 1 (LSF1)	Front Stretcher
Leg-Stretchers Front 2 (LSF2)	N/A
Height	Height
Leg-Stretchers Back 1 (LSB1)	Back Stretcher
Leg-Stretchers Back 2 (LSB2)	N/A
Height	Height
Leg-Stretchers Side 1 (LSS1)	Side Stretcher
Leg-Stretchers Side 2 (LSS2)	N/A
Leg-Stretchers Side 3 (LSS3)	N/A
N/A	Outer Frame Section
N/A	Diameter
N/A	Width/Depth
N/A	Height
Leg-Stretchers Cross 1 (LSC1)	Cross Stretcher
Leg-Stretchers Cross 2 (LSC2)	N/A
Depth Spacing	Depth Spacing
Leg-Stretchers Long 1 (LSL1)	Long Stretcher
Leg-Stretchers Long 2 (LSL2)	N/A
Leg-Stretchers Long 3 (LSL3)	N/A
Leg-Stretchers Long 4 (LSL4)	N/A
Leg-Stretchers Long 5 (LSL5)	N/A
Width Front Spacing	Width Front Spacing
Width Rear Spacing	Width Rear Spacing
Leg-Stretchers Radial 1 (LSR1)	Radial Stretcher
Leg-Stretchers Radial 2 (LSR2)	N/A
N/A	Inner Frame Section
N/A	Diameter
N/A	Width/Depth
N/A	Height
Leg-Stretchers Panel (LSP)	Stretchers Panel
N/A	Thickness
Leg-Base Guides (LBG)	Base Guides
Width	Width
Depth	Depth
Front Radius	Front Radius
Rear Radius	Rear Radius
Leg-Base Front 1 (LBF1)	Base Front Rail

MCG	ChairDNA
Leg-Base Front 2 (LBF2)	N/A
Leg-Base Front 3 (LBF3)	N/A
Leg-Base Back 1 (LBB1)	Base Back Rail
Leg-Base Back 2 (LBB2)	N/A
Leg-Base Back 3 (LBB3)	N/A
Leg-Base Side 1 (LBS1)	Base Side Rail
Leg-Base Side 2 (LBS2)	N/A
Leg-Base Side 3 (LBS3)	N/A
Leg-Base Side 4 (LBS4)	N/A
N/A	Outer Frame Section
N/A	Diameter
N/A	Width/Depth
N/A	Height
Leg-Base Cross 1 (LBC1)	Base Cross Rail
Leg-Base Cross 2 (LBC2)	N/A
Depth Spacing	Depth Spacing
Leg-Base Long 1 (LBL1)	Base Long Rail
Leg-Base Long 2 (LBL2)	N/A
Leg-Base Long 3 (LBL3)	N/A
Leg-Base Long 4 (LBL4)	N/A
Leg-Base Long 5 (LBL5)	N/A
Width Front Spacing	Width Front Spacing
Width Rear Spacing	Width Rear Spacing
Leg-Base Radial 1 (LBR1)	Base Radial Rail
Leg-Base Radial 2 (LBR2)	N/A
Leg-Base Radial 3 (LBR3)	N/A
Number	Number
N/A	Inner Frame Section
N/A	Diameter
N/A	Width/Depth
N/A	Height
Leg-Base Panel (LBP)	Base Panel
N/A	Thickness
Arms Guides (AG)	Arms Guides
Height	Height
Depth	Depth
Depth Rear Spacing	Depth Rear Spacing
Tilt Angle	Tilt Angle
Front Radius	Front Radius
Rear Radius	Rear Radius
Arm Support Front 1 (ASF1)	Arm Front Support
Arm Support Front 2 (ASF2)	N/A
Arm Support Front 3 (ASF3)	N/A
Arm Support Front 4 (ASF4)	N/A
Arm Support Back 1 (ASB1)	Arm Back Support
Arm Support Back 2 (ASB2)	N/A
Arm Support Back 3 (ASB3)	N/A
Arm Support Back 4 (ASB4)	N/A
Arm Support Back 5 (ASB5)	N/A
Armrest 1 (AR1)	Armrest
Armrest 2 (AR2)	N/A

MCG	ChairDNA
Armrest 3 (AR3)	N/A

Armrest 4 (AR4)	N/A
N/A	Outer Frame Section
N/A	Diameter
N/A	Width
N/A	Depth/Height
Arm Support Side 1 (ASS1)	Arm Side Support
Arm Support Side 2 (ASS2)	N/A
Arm Support Side 3 (ASS3)	N/A
Depth Top Spacing	Depth Top Spacing
Depth Bottom Spacing	Depth Bottom Spacing
N/A	Section
N/A	Diameter
N/A	Width
N/A	Depth
Arm Panel (AP)	Arm Panel
N/A	Thickness
Round Section (MSF-SR)	N/A
Diameter	N/A
Taper Ratio	N/A
Square Section (MSF-SS)	N/A
Width	N/A
Length	N/A
Taper Ratio	N/A
Panels (MSP)	N/A
Thickness	N/A
Termination (T)	N/A

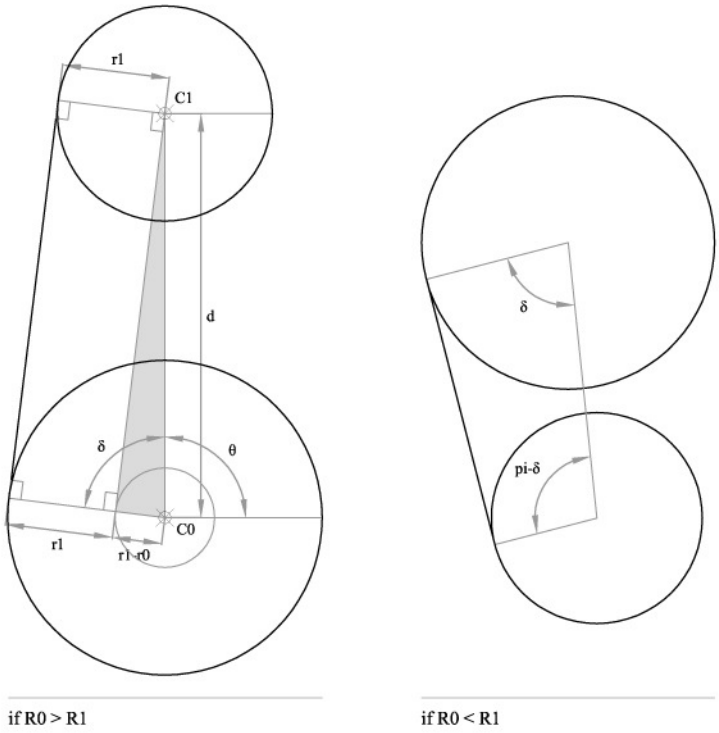
Totals	
169	162

Appendix 6.C ChairDNA 1.2 Source Code

Appendix 6.C.1 Geometric Functions

Tangent Between 2 Circles – Polar Angle of the Perpendicular

#; TANGENT BETWEEN 2 CIRCLES - POLAR ANGLE OF THE PERPENTICULAR

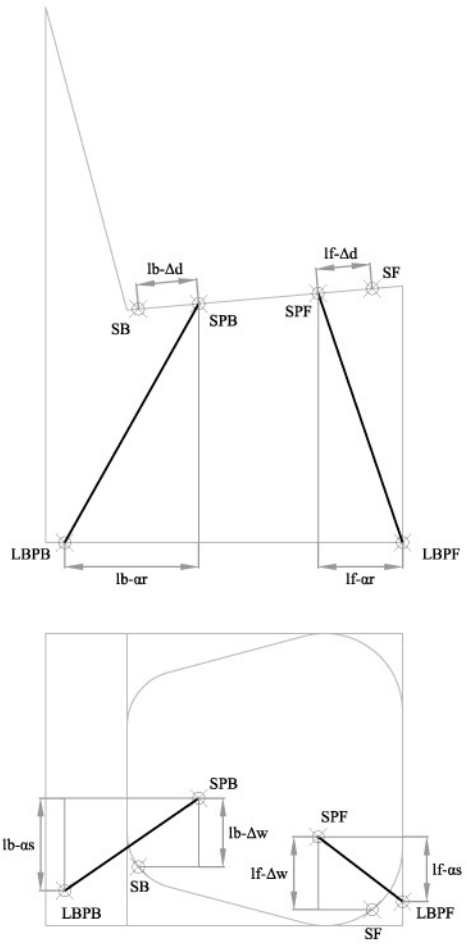


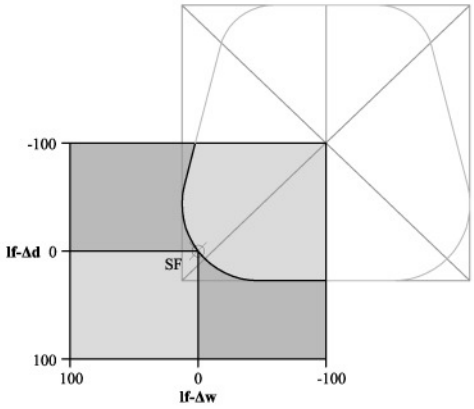

```
;LINE SLOPE
(define (θ-slope P0 P1) ;give 2 points of the line, P0 is higher that P1
  (if (= (cx P0) (cx P1)) pi/2 ;if P0-P1 is vertical (or P0=P1)
  (pol-phi (p-p P0 P1)))) ;p-p places line in origin

(define (pol-tan-2circles r0 r1 C0 C1) ;give 2 radius and 2 centres
  (let ((δ-angle
    (let ((res
          (cond
            ((and (>= r0 r1) (not (= (distance C0 C1) 0))) (acos (/ (- r0 r1) (distance C0 C1))))
            ((and (> r1 r0) (not (= (distance C0 C1) 0))) (- pi (acos (/ (- r1 r0) (distance C0 C1)))))
            ((= (cx C0) (cx C1)) pi/2) ;if P0-P1 is vertical (or P0=P1)
            )))
      (if (complex? res) ;as tan function is producing an imaginary number
        (real-part res)
        res))))
    (+ δ-angle (θ-slope C1 C0))))
;special case: when C0=C1 and r0=r1=100%, then δ-tan-2circles and θ-slope = pi/2 (for this purpose, as mathematically there is no slope nor tangent)
```

Appendix 6.C.2 General and Specific Functions

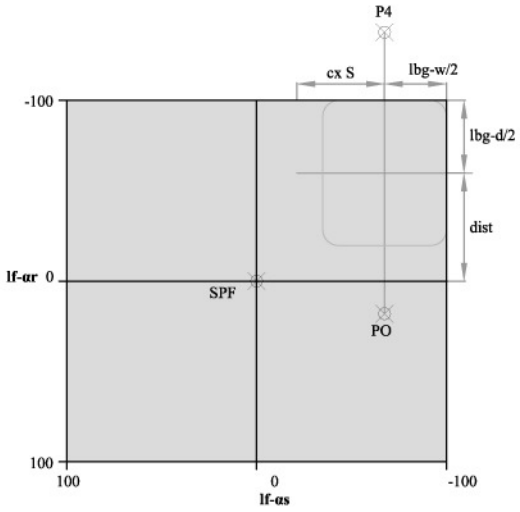
Legs (General Function)

#;





SPF (varying width & depth spacing)



LBPF (varying splay & rake angles)

```
(define (legs
      l ;boolean
      l-Δw l-Δd ;width and depth spacing
      l-αs l-αr ;splay and rake angles
      SR) ;reference point in seat and in base
 ;IN SEAT
 ;CONVERSIONS (PERCENTAGE > MILLIMETERS)
 ;leg-Δwidth (max = 100% = distance vertical axis of S)
 (define l-Δw-mm (/ (* l-Δw (cx SR)) 100))
 ;leg-Δdepth (max = 100% = distance horizontal axis of S)
 (define l-Δd-mm (/ (* l-Δd (abs (- (/ sg-d 2) (cy SR)))) 100))
 ;POINT
 (define LS
  (cond
    ((and (< l-Δw 0) (or (>= lf-Δd 0) (>= lb-Δd 0))) (loc-in-world (+y SR l-Δd-mm)))
    ((and (>= l-Δw 0) (or (< lf-Δd 0) (< lb-Δd 0))) (loc-in-world (+x SR l-Δw-mm)))
    ((and (< l-Δw 0) (or (< lf-Δd 0) (< lb-Δd 0))) (loc-in-world SR))
    (else (loc-in-world (+xy SR l-Δw-mm l-Δd-mm)))))
 ;IN BASE
 ;CONVERSIONS (PERCENTAGE > MILLIMETERS)
 ;leg-angle-splay (max = 100% = opposite edge of the base in width)
 (define l-αs-mm (/ (* l-αs (- (cx LS) (/ lbg-w-mm 2))) 100))
```

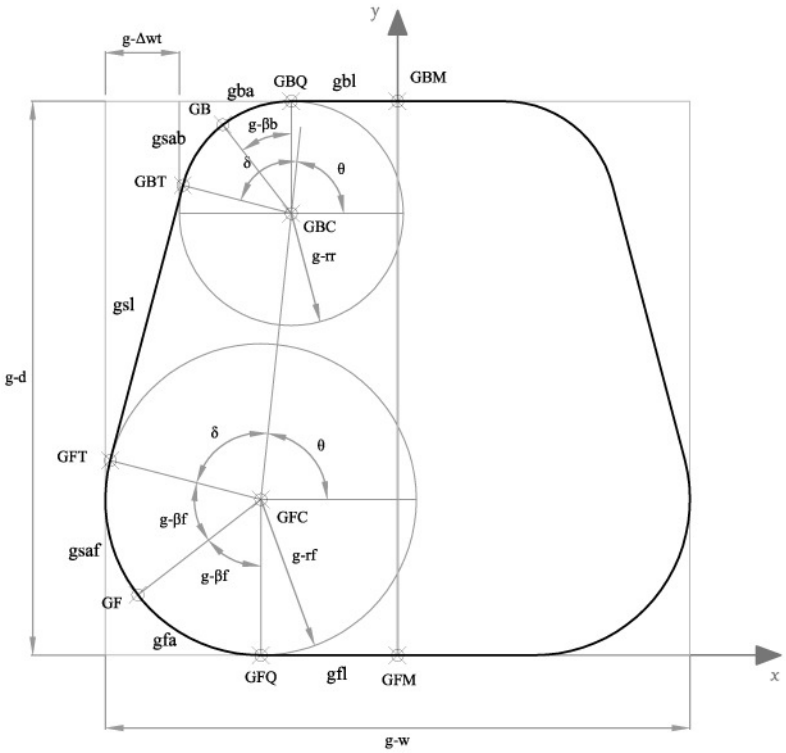
```
;leg-angle-rake (max = 100% = opposite edge of the base in depth)
(define l-αr-mm
 (let ((LBM (point-in-line (xyz 0 (cy (loc-in-world SFM)) 0) (xyz 0 (cy (loc-in-world BBM)) 0) 50))) ;middle pt of base
  (/ (* l-αr (+ (abs (- (cy LBM) (cy LS))) (/ lbg-d-mm 2))) 100)))
;POINT
(define LB (+xyz LS l-αs-mm l-αr-mm (- (cz LS))))
;GEOMETRY
(define leg (when l (line LB LS)))
;PARAMETERS
(values LS LB leg))
```

Legs (Specific Functions)

```
;----------LEG-FRONT----------
(define-values (SPF LBPF leg-front)
 (let ((SRF
      (let ((SFF (when (< lf-Δw 0) (point-in-virtual-curve sfr (- 100 (- lf-Δw)))))
           (SFS (when (< lf-Δd 0) (point-in-virtual-curve ssr (- (/ lf-Δd 2))))))
       (cond ((and (< lf-Δw 0) (>= lf-Δd 0)) SFF)
             ((and (>= lf-Δw 0) (< lf-Δd 0)) SFS)
             ((and (< lf-Δw 0) (< lf-Δd 0)) (xyz (cx SFF) (cy SFS) (cz SFS)))
             ((and (>= lf-Δw 0) (>= lf-Δd 0)) SF)))))
  (legs
   lf
   lf-Δw (- lf-Δd)
   lf-αs (- lf-αr)
   SRF)))

;----------LEG-BACK----------
(define-values (SPB LBPB leg-back)
 (let ((SRB
      (let ((SBB (when (< lb-Δw 0) (point-in-virtual-curve sbr (- lb-Δw))))
           (SBS (when (< lb-Δd 0) (point-in-virtual-curve ssr (- 100 (/ (- lb-Δd) 2))))))
       (cond ((and (< lb-Δw 0) (>= lb-Δd 0)) SBB)
             ((and (>= lb-Δw 0) (< lb-Δd 0)) SBS)
             ((and (< lb-Δw 0) (< lb-Δd 0)) (xyz (cx SBB) (cy SBS) (cz SBS)))
             ((and (>= lb-Δw 0) (>= lb-Δd 0)) SB)))))
  (legs
   lb
   lb-Δw lb-Δd
   lb-αs lb-αr
   SRB)))
```

Outer Frame (General Function)

#;

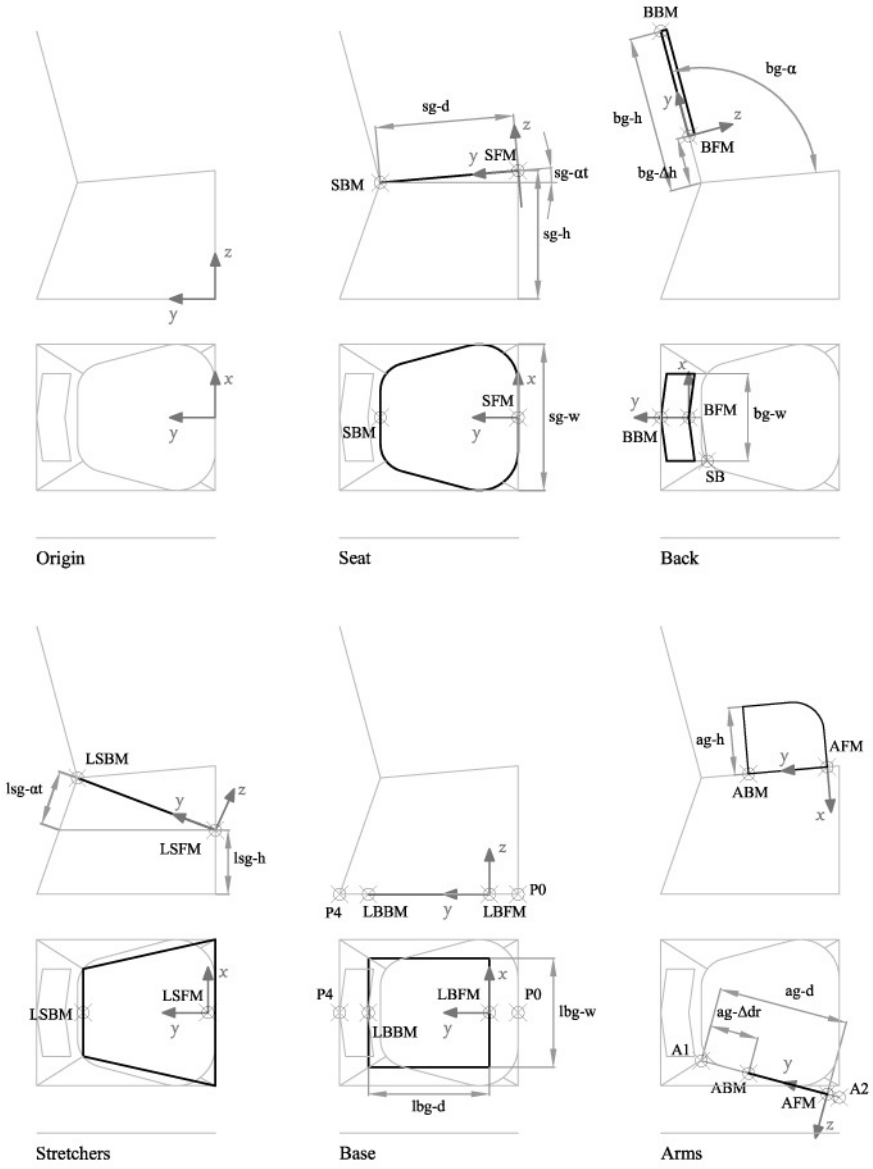



```
(define (outer-frame
        g-rf g-rr ;front and rear radius
        g-w g-d g-Δwt ;width, depth and taper width
        GFM-world Px Py ;ucs: origin, point in x, point in y
        GPF GPB) ;front and back points in legs
  (parameterize ((immediate-mode? #f))
    (define area-independent (nor GPF GPB))
    (define area-dependent (and GPF GPB))
    ;---AREA-INDEPENDENT
    ;CONVERSIONS (PERCENTAGE > MILLIMETERS)
    ;area-Δwidth-taper (max = 100% = g-w/2)
    (define g-Δwt-mm (when area-independent (/ (* g-Δwt (/ g-w 2)) 100)))
    ;POINT (origin in new ucs)
    (define O (when area-independent (loc-from-o-vx-vy GFM-world (p-p Px GFM-world) (p-p Py GFM-world))))  ;new ucs on point GFM (xyz-on origin x-axis y-
axis) ;norm-c: vector length = 1
    ;---AREA-DEPENDENT
    ;POINTS (in new ucs)
    (define ucs-area (when area-dependent (cs-from-o-vx-vy (xyz 0 (cy GPF) (cz GPF)) (vx 1) (p-p GPB GPF))))
    (define GPFn (when area-dependent (loc-in-cs GPF ucs-area))) ;cz = 0
    (define GPBn (when area-dependent (loc-in-cs GPB ucs-area)))
    (define GC (when area-dependent (loc-in-cs (circumcenter-from-two-points-symetric-in-y GPF GPB) ucs-area))) ;circumcenter
    ;---DIFFERENT VALUES
    ;RADIUS
    ;radius-front
    (define g-rf-mm (cond
                (area-independent ;(max = 100% = g-w/2 or g-d/2)
                 (cond ((<= g-d g-w) (/ (* g-rf (/ g-d 2)) 100))  ;currently, always sg-d <= sg-w
                       ((< g-w g-d) (/ (* g-rf (/ g-w 2)) 100))))
                (area-dependent ;(max = 100% = distance to circumcenter)
                 (/ (* g-rf (distance GC GPFn)) 100)))) ;(distance C GF)) 100))
    ;radius-rear
    (define g-rr-mm (cond
                (area-independent ;(max = 100% = (- g-w/2 g-Δwt-mm) or g-d)
                 (cond ((<= (/ g-d 2) (- (/ g-w 2) g-Δwt-mm)) (/ (* g-rr (/ g-d 2)) 100))
                       ((< (- (/ g-w 2) g-Δwt-mm) (/ g-d 2)) (/ (* g-rr (- (/ g-w 2) g-Δwt-mm)) 100))))
                (area-dependent ;(max = 100% = distance to circumcenter)
                 (/ (* g-rr (distance GC GPBn)) 100))))
```

```
;CENTER-POINTS
;front
(define GFC (cond
        (area-independent (+xy O (+ (- (/ g-w 2)) g-rf-mm) g-rf-mm))
        (area-dependent (cond ((= g-rf 100) GC) ;(loc-in-cs C ucs-stretchers))
                ((not (= g-rf 100)) (+pol GPFn g-rf-mm (θ-slope GC GPFn)))))))
;back
(define GBC (cond
        (area-independent (+xy (+y O g-d) (+ (- (/ g-w 2)) g-Δwt-mm g-rr-mm) (- g-rr-mm)))
        (area-dependent (cond ((= g-rr 100) GC) ;(loc-in-cs C ucs-stretchers))
                ((not (= g-rr 100)) (+pol GPBn g-rr-mm (θ-slope GC GPBn)))))))
;---COMMON VALUES
;POINTS
;quadrant-points
(define GFQ (+pol GFC g-rf-mm (/ 3pi 2)))
(define GBQ (+pol GBC g-rr-mm pi/2))
;mid-points
(define GFM (+x GFQ (- (cx GFQ))))
(define GBM (+x GBQ (- (cx GBQ))))
;tangent-points
(define GFT (+pol GFC g-rf-mm (pol-tan-2circles g-rf-mm g-rr-mm GFC GBC)))
(define GBT (+pol GBC g-rr-mm (pol-tan-2circles g-rf-mm g-rr-mm GFC GBC)))
;ANGLES (half arc)
(define g-βf (/ (+ (/ 3pi 2) (- (pol-tan-2circles g-rf-mm g-rr-mm GFC GBC))) 2))
(define g-βb (/ (+ (pol-tan-2circles g-rf-mm g-rr-mm GFC GBC) -pi/2) 2))
;POINTS (reference-points)
(define GF (+pol GFC g-rf-mm (+ (pol-tan-2circles g-rf-mm g-rr-mm GFC GBC) g-βf)))  ;associated with LF
(define GB (+pol GBC g-rr-mm (+ pi/2 g-βb)))  ;associated with LB
;GEOMETRY
;front-rail
(define gfl (line-new GFM GFQ))
(define gfa (arc-new GFC g-rf-mm 3pi/2 (- g-βf)))
;side-rail
(define gsaf (arc-new GFC g-rf-mm (+ 3pi/2 (- g-βf)) (- g-βf)))
(define gsl (line-new GFT GBT))
(define gsab (arc-new GBC g-rr-mm (+ pi/2 (* 2 g-βb)) (- g-βb)))
;back-rail
(define gba (arc-new GBC g-rr-mm (+ pi/2 g-βb) (- g-βb)))
(define gbl (line-new GBQ GBM))
;PARTS
(define guide (join-curves-new (list gfl gfa gsaf gsl gsab gba gbl)))
(define front-rail (join-curves-new (list gfl gfa)))
(define front-rail2 (join-curves-new (list gfl gfa gsaf))) ;applicable only in back-bottom (complete arc)
(define side-rail (join-curves-new (list gsaf gsl gsab)))
(define back-rail (join-curves-new (list gba gbl)))
(define back-rail2 (join-curves-new (list gsab gba gbl))) ;applicable only in back-top (complete arc)
(define back-curve (join-curves-new (list gsab gba))) ;applicable only to calculate back-width
(define panel
 (surface
  (join-curves-new
   (list gfl gfa gsaf gsl gsab gba gbl
       (line-new GBM GFM))))) ;the curve has to be closed
;PARAMETERS
(values
 GFM GBM GFQ GBQ GFC GBC GFT GBT GF GB ;POINTS
 guide front-rail front-rail2 side-rail back-rail back-rail2 back-curve panel))) ;PARTS
```

Outer Frame (Speicifc Functions)

```
#;
```

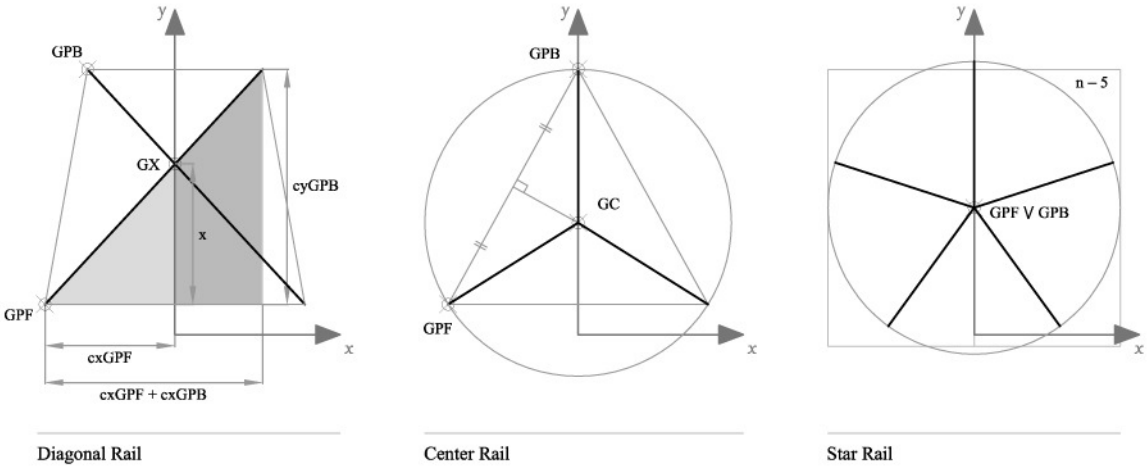



```
;----------SEAT OUTER-FRAME----------
;ANGLE
(define sg-αt-rad (deg>rad sg-αt)) ;conversion degree > radian
;POINTS
(define P1 (z sg-h)) ;SFM
(define P2 (+sph P1 sg-d pi/2 (+ pi/2 sg-αt-rad))) ;SBM
;VALUES
(define-values (SFM SBM SFQ SBQ SFC SBC SFT SBT SF SB sgr sfr sfcr ssr sbr sbcr sbc sp-d)
  (outer-frame
   sg-rf sg-rr
   sg-w sg-d sg-Δtw
   P1 (+x P1 1) P2
   #f #f))

;----------BACK OUTER-FRAME-----------
;ANGLE
(define bg-α-rad (deg>rad bg-α)) ;conversion degree > radian
;POINTS
(define P23 (+sph P2 bg-Δh pi/2 (- (+ sg-αt-rad bg-α-rad) pi/2))) ;BFM
(define P3 (+sph P2 bg-h pi/2 (- (+ sg-αt-rad bg-α-rad) pi/2))) ;BBM
;VALUES
(define-values (BFM BBM BFQ BBQ BFC BBC BFT BBT BB BT bgr bfr bfcr bsr bbr bbcr bbc bp-d)
  (let*
     ((curve-sbr (if (= sg-Δtw 100) 1 (curve-length-virtual sbr)))
```

```
    (bg-w-min (/ 125 2)) ;is not 360 because this distance is at the bottom
    (min (/ (* bg-w-min 100) curve-sbr))
    (BPB (cond ((and (> curve-sbr bg-w-min) (< bg-w 50)) (point-in-virtual-curve sbr (- 100 (+ min (/ (* bg-w (- 100 min)) 100)))))
           ((and (> curve-sbr bg-w-min) (>= bg-w 50) (not (= sg-rr 0))) (point-in-virtual-curve sbc (- 100 bg-w)))
           ((and (> curve-sbr bg-w-min) (>= bg-w 50) (= sg-rr 0)) SB)
           ((<= curve-sbr bg-w-min) (+x SBM bg-w-min))))
    (bg-w-mm (distance SBM BPB)))
  (outer-frame
   bg-rb bg-rt
   (* 2 bg-w-mm) (- bg-h bg-Δh) bg-Δtw
   P23
   (+pol
    (loc-from-o-vx-vy P23 (vx 1) (p-p (+sph P23 1 pi/2 (+ sg-αt-rad bg-α-rad)) P23)) ;P23 in plane perpendicular to back ucs
    1
    (- (pol-phi (p-p SB SBM)) pi))
   P3
   #f #f)))

;----------LEG-BASE----------
;POINTS
(define PO (xyz 0 0 0)) ;horizontal projection of P1 (ORIGIN)
(define P4 (xyz (cx P3) (cy P3) 0)) ;horizontl projection of P3
;CONVERSIONS (PERCENTAGE > MILLIMETERS)
;leg-base-Δwidth (max = 100% = seat-width)
(define lbg-w-mm (/ (* lbg-w sg-w) 100))
;leg-base-Δdepth (max = 100% = horizontal projection of the chair)
(define lbg-d-mm (/ (* lbg-d (distance PO P4)) 100))
;VALUES
(define-values (LBFM LBBM LBFQ LBBQ LBFC LBBC LBFT LBBT LBF LBB lbgr lbfr lbfcr lbsr lbbr lbbcr lbbc lbp-d)
 (let ((O (p+v (point-in-line PO P4 50) (vy (- (/ lbg-d-mm 2))))))
  (outer-frame
   lbg-rf lbg-rr
   lbg-w-mm lbg-d-mm 0
   O (+x O 1) P4
   #f #f)))

;----------LEG-STRETCHERS OUTER-FRAME----------
;FN: it determines the factor in a line betwen [-100 100%] (instead of [0 100%]), being f0 the 0% (may not be the midpoint)
(define (fn f0 f)
      (cond ((>= f 0) (+ f0 (/ (* f (- 100 f0)) 100)))
            ((< f 0) (+ f0 (/ (* f f0) 100)))))
;POINTS
(define LSPF (point-in-line LBPF SPF lsg-h))
(define LSPB (point-in-line LBPB SPB (fn lsg-h lsg-αt)))
;values
(define-values (LSFM LSBM LSFQ LSBQ LSFC LSBC LSFT LSBT LSF LSB lsgr lsfr lsfcr lssr lsbr lsbcr lsbc lsp-d)
 (outer-frame
  lsg-rf lsg-rr
  #f #f #f
  #f #f #f
  LSPF LSPB))

;----------ARM OUTER-FRAME----------
(define-values (AFM ABM AFQ ABQ AFC ABC AFT ABT AF AB agr afr afcr asr abr abcr abc ap-d)
 (let* ((A1 (intersection-lines SFT SBT SBM (+x SBM 1)))
      (A2 (intersection-lines SBT SFT SFM (+x SFM 1)))
      (ag-d-mm (/ (* ag-d (- (distance A1 A2) 245)) 100)) ;max: (distance A1 A2); min: 245
      (AFM (+pol A1 (- (+ 245 ag-d-mm)) (pol-phi (p-p SBT SFT)))))
  (outer-frame
   ag-rf ag-rr
   (* ag-h 2) (- (+ 245 ag-d-mm) ag-Δdr) ag-αt ;ag-h is already half of the area's width
   AFM (+z AFM (- 1)) SBT
   #f #f)))
```

Radial Rails (General Function)

#;




```
(define (radial-rail
        gr-n ;number of star-vertices
        PF PB ;front and back points in legs
        g-w g-d) ;width and depth
  ;POINTS (in new ucs)
  (define ucs-area (cs-from-o-vx-vy (xyz 0 (cy PF) (cz PF)) (vx 1) (p-p PB PF)))
  (define GPF (loc-in-cs PF ucs-area))
  (define GPB (loc-in-cs PB ucs-area))
  (define GC
    (if (and (coincident? PF PB) (not (= (cz PF) 0)))
        (loc-in-cs (circumcenter-from-two-points-symetric-in-y PF PB) (cs-from-o-vx-vy PF (vx 1) (p-p SBM PF))) ;seat-radial case
        (circumcenter-from-two-points-symetric-in-y PF PB)))
  (cond
    ;DIAGONAL-RAIL (4 legs)
    ((or  (and lf lb (not (= lf-Δw -100)) (not (= lb-Δw -100)))
          (and bu (not (= bg-Δtw 100))))
     (let ((GX (+xy GPF (- (cx GPF)) (/ (* (- (cx GPF)) (cy GPB)) (+ (- (cx GPF)) (- (cx GPB)))))))
       (line GPF GX GPB)))
    ;CENTER-RAIL (3 legs)
    ((or (and lf lb (or (= lf-Δw -100) (= lb-Δw -100)) (not (and lf lb (= lf-Δw -100) (= lf-Δd -100) (= lb-Δw -100) (= lb-Δd -100))))
         (and bu (= bg-Δtw 100)))
     (line GPF GC GPB))
    ;STAR-RAIL (1 leg)
    ((and (or lf lb) (= lf-Δw -100) (= lf-Δd -100) (= lb-Δw -100) (= lb-Δd -100))
     (define radius (if (>= g-w g-d) (/ g-d 2) (/ g-w 2))) ;smallest dimension
     (define dphi (/ 2pi gr-n))
     (define (star-rail radius gr-n)
       (if (= gr-n 0) (list)
           (append
            (list (line GC (+pol GC radius (+ pi/2 (* dphi (- gr-n 1)))))) ;starts in pi/2
            (star-rail radius (- gr-n 1)))))
     (star-rail radius gr-n))
    ))
```

Radial Rails (Specific Functions)

```
;----------SEAT RADIAL RAIL----------
(define seat-radial
  (when sr
    (radial-rail sr-n SPF SPB sg-w sg-d)))


;----------BACK RADIAL----------
(define back-radial
  (when br
```

```
    (radial-rail #f (loc-in-world BPM) (loc-in-world BPT) #f #f)
    ))


;----------LEG-STRETCHER RADIAL RAIL----------
(define leg-stretcher-radial
  (when lsr
    (radial-rail #f LSPF LSPB #f #f)))


;----------LEG-BASE RADIAL RAIL----------
(define leg-base-radial
  (when lbr
    (radial-rail lbr-n LBPF LBPB lbg-w-mm lbg-d-mm)))
```

Appendix 6.C.3 GUI Functions

Tab Seat

```
;----------SEAT GUIDES----------
(define tab-sg (default-panel tab-seat '()))

(default-check-box
  tab-sg tab-sg tab-sg-sliders
  seat-guides
  #t
  (when (and seat-guides back-guides leg-guides leg-base-guides)
    (send (get-widget 'guides) set-value #t))
  (when (nor seat-guides back-guides leg-guides leg-base-guides)
    (send (get-widget 'guides) set-value #f)))

(define tab-sg-sliders (default-panel tab-sg '()))

(default-slider tab-sg-sliders seat-guides-width #t)
(default-slider tab-sg-sliders seat-guides-depth #t)
(default-slider tab-sg-sliders seat-guides-height #t)
(default-slider tab-sg-sliders seat-guides-angle-tilt #t)
(default-slider tab-sg-sliders seat-guides-radius-front #t)
(default-slider tab-sg-sliders seat-guides-radius-rear #t)
(default-slider tab-sg-sliders seat-guides-Δtaper-width #t)

;----------SEAT OUTER FRAME----------
(define tab-so (default-panel tab-seat '()))

(new message% [parent tab-so] [label "Seat Outer Frame"])

;----------SEAT FRONT----------
(default-check-box
  tab-so #f #f
  seat-front
  #t
  (consequent-checkbox (or (and seat-front (or seat-back seat-cross leg-back)) (and seat-back (or seat-cross leg-front))) 'seat-long tab-sl tab-sl-sliders)
  (consequent-slider (or seat-front seat-cross) 'seat-long-Δwidth-front)
  (consequent-radiobutton (or seat-front seat-back seat-side) 'seat-outer-sround tab-so-section
                          (if seat-outer-sround tab-so-sround-sliders tab-so-ssquare-sliders)))

;----------SEAT BACK----------
(default-check-box
  tab-so #f #f
  seat-back
  #t
  (consequent-checkbox (or (and seat-front (or seat-back seat-cross leg-back)) (and seat-back (or seat-cross leg-front))) 'seat-long tab-sl tab-sl-sliders)
  (consequent-slider (or seat-back seat-cross) 'seat-long-Δwidth-rear)
  (consequent-radiobutton (or seat-front seat-back seat-side) 'seat-outer-sround tab-so-section
                          (if seat-outer-sround tab-so-sround-sliders tab-so-ssquare-sliders))
  (consequent-checkbox (or (and back-top (or back-bottom back-cross seat-back)) (and back-bottom back-cross) seat-long) 'back-splat tab-bs tab-bs-sliders)
  (consequent-slider (or back-bottom back-cross seat-back) 'back-splat-Δwidth-bottom))

;----------SEAT SIDE----------
(default-check-box
  tab-so #f #f
  seat-side
  #t
  (consequent-checkbox (or seat-side seat-long) 'seat-cross tab-sc tab-sc-sliders)
  (consequent-radiobutton (or seat-front seat-back seat-side) 'seat-outer-sround tab-so-section
                          (if seat-outer-sround tab-so-sround-sliders tab-so-ssquare-sliders))
  ;back
  (consequent-checkbox (or leg-back seat-side armrest) 'back-upright #f #f)
  ;arm
  (consequent-checkbox (or leg-front seat-side) 'arm-support-front #f #f)
  (consequent-checkbox (or leg-back seat-side) 'arm-support-back #f #f)
  (consequent-checkbox (or leg-front leg-back seat-side) 'arm-support-side tab-ass tab-ass-sliders)
  (consequent-slider seat-side 'arm-support-side-Δdepth-bottom))

;----------SEAT OUTER FRAME SECTION----------
(define tab-so-section (default-panel tab-so '()))
(round-square-radiobutton
  tab-so-section
  tab-so-sround-sliders
  tab-so-ssquare-sliders
  seat-outer-sround
```

```
 (antecedent (or seat-front seat-back seat-side)))

(define tab-so-sround-sliders (default-panel tab-so-section '(deleted)))
(default-slider tab-so-sround-sliders seat-outer-sround-diameter #t)

(define tab-so-ssquare-sliders (default-panel tab-so-section '(deleted)))
(default-slider tab-so-ssquare-sliders seat-outer-ssquare-width #t)
(default-slider tab-so-ssquare-sliders seat-outer-ssquare-height #t)

;----------SEAT INNER FRAME----------
(define tab-si (default-panel tab-seat '()))

(new message% [parent tab-si] [label "Seat Inner Frame"])

;----------SEAT CROSS----------
(define tab-sc (default-panel tab-si '()))
(define tab-sc-sliders (default-panel tab-sc '(deleted)))

(default-check-box
 tab-sc tab-sc tab-sc-sliders
 seat-cross
 (antecedent (or seat-side seat-long))
 (consequent-slider (or seat-back seat-cross) 'seat-long-Δwidth-front)
 (consequent-slider (or seat-back seat-cross) 'seat-long-Δwidth-rear)
 (consequent-checkbox (or (and seat-front (or seat-back seat-cross leg-back)) (and seat-back (or seat-cross leg-front))) 'seat-long tab-sl tab-sl-sliders)
 (consequent-radiobutton (or seat-cross seat-long seat-radial) 'seat-inner-sround tab-si-section
                         (if seat-inner-sround tab-si-sround-sliders tab-si-ssquare-sliders))
 (consequent-slider (or seat-cross seat-long seat-radial) 'seat-inner-sround-diameter))

(default-slider tab-sc-sliders seat-cross-Δdepth #t)
(default-slider tab-sc-sliders seat-cross-number #t)

;----------SEAT LONG----------
(define tab-sl (default-panel tab-si '()))
(define tab-sl-sliders (default-panel tab-sl '(deleted)))

(default-check-box
 tab-sl tab-sl tab-sl-sliders
 seat-long
 (antecedent (or (and seat-front (or seat-back seat-cross leg-back)) (and seat-back (or seat-cross leg-front))))
 (consequent-checkbox (or seat-side seat-long) 'seat-cross tab-sc tab-sc-sliders)
 (consequent-checkbox (or (and back-top (or back-bottom back-cross seat-back)) (and back-bottom back-cross) seat-long) 'back-splat tab-bs tab-bs-sliders)
 (consequent-radiobutton (or seat-cross seat-long seat-radial) 'seat-inner-sround tab-si-section
                         (if seat-inner-sround tab-si-sround-sliders tab-si-ssquare-sliders))
 (consequent-slider (or seat-cross seat-long seat-radial) 'seat-inner-sround-diameter))

(default-slider tab-sl-sliders seat-long-Δwidth-front
 (antecedent (or seat-front seat-cross)))

(default-slider tab-sl-sliders seat-long-Δwidth-rear
 (antecedent (or seat-back seat-cross)))

(default-slider tab-sl-sliders seat-long-number #t)

;----------SEAT RADIAL----------
(define tab-sr (default-panel tab-si '()))
(define tab-sr-sliders (default-panel tab-sr '(deleted)))

(default-check-box
 tab-sr tab-sr tab-sr-sliders
 seat-radial
 (antecedent (or leg-front leg-back))
 (consequent-radiobutton (or seat-cross seat-long seat-radial) 'seat-inner-sround tab-si-section
                         (if seat-inner-sround tab-si-sround-sliders tab-si-ssquare-sliders))
 (consequent-slider (or seat-cross seat-long seat-radial) 'seat-inner-sround-diameter))

(default-slider tab-sr-sliders seat-radial-number #t)

;----------SEAT INNER FRAME SECTION----------
(define tab-si-section (default-panel tab-si '()))
(round-square-radiobutton
 tab-si-section
 tab-si-sround-sliders
 tab-si-ssquare-sliders
 seat-inner-sround
 (antecedent (or seat-cross seat-long seat-radial)))
```

```
(define tab-si-sround-sliders (default-panel tab-si-section '()))
(default-slider tab-si-sround-sliders seat-inner-sround-diameter #t)

(define tab-si-ssquare-sliders (default-panel tab-si-section '(deleted)))
(default-slider tab-si-ssquare-sliders seat-inner-ssquare-width #t)
(default-slider tab-si-ssquare-sliders seat-inner-ssquare-height #t)

;----------SEAT PANEL----------
(define tab-sp (default-panel tab-seat '()))
(define tab-sp-sliders (default-panel tab-sp '(deleted)))

(default-check-box
  tab-sp tab-sp tab-sp-sliders
  seat-panel
  #t)

(default-slider tab-sp-sliders seat-panel-thickness #t)
```

Appendix 6.D Features Lists

Appendix 6.D.1 New Features in ChairDNA 1.1

Table 1 New features in ChairDNA 1.1, developed from ChairDNA 1.1.0

Topic	Feature	Source
BUGS (SOLVED)	Solved bug: solid mode is generating surfaces instead of solids (which disables 3D printing)	**Evaluation 1 (PT)**
EDITED	Renamed: acronyms (V1.0) to names	**Evaluation 1 (PT)**
ADDED	Part: Seat Surface Side (removed in V1.2)	Developer
	Part: Back Upright Arm (removed in V1.2)	Developer
	Part: Back Cross Arm (removed in V1.2)	Developer
	Part: Back Splat	Developer

	Evaluation 1	**Developer**	**TOTAL**
Bugs	1	0	**1**
Edit	1	0	**1**
Add	0	4	**4**
TOTAL	**2**	**4**	**6**

Appendix 6.D.2 New Features in ChairDNA 1.2

Table 2 New features in ChairDNA 1.2, developed from ChairDNA 1.1

Topic	Feature	Source
BUGS (SOLVED)	Multiple Seat Outer Frame can be simultaneously selected	**Evaluation 1**
	Multiple Seat & Back Surfaces can be simultaneously selected	**Evaluation 1**
	Seat Side (in cantilever case) and Back Upright do not follow the angle of their guides	**Evaluation 1**
	Back Panel and Seat Panel thickness is in wrong direction	**Evaluation 1**
	The Panels need to be placed above the frame	**Evaluation 1**
	The checkbox of Back Surface is sometimes accidentally hidden	**Evaluation 1**
	The Base Cross crashes the program	**Evaluation 1**
	Sliders do not get disabled (when applicable)	Developer
	In Rhino4 the mirror only works in perspective view (solved in Rhino5)	Developer
	Consider two checkboxes A and B, being A the antecedent of B. Both start checked; when A is unchecked and checked again, B is unchecked but the corresponding part is placed	Developer
	When the Guides and the Frame overlap, the guides are displayed above (in Rhino, the last object drawn is displayed below, while in AutoCAD is displayed above). In V1.2, in AutoCAD only the mirrored side is correct	Developer
	The Radial Stretcher and the Arm Supports are not in the same plane of their guides	Developer
	The Back Cross cannot be placed when the two Back Uprights (Back Upright and Back Upright Arm) are active	Developer
	With non zero Seat Radius, the measurable Seat Width was smaller than the slider value	Developer
	When the Legs Width and Depth were both positive, the leg extensions cross the sitting area	Developer
EDITED		
Parameters (names)	Renamed: *Length* to *Width*, and *Width* to *Depth*	**Evaluation 1 (PT)**
	Renamed: *Crosswise Spacing* to *Width Spacing*, and *Lengthwise spacing* to *Depth Spacing*	Developer
	Renamed: *Taper Angle* to *Taper Ratio*	Developer
	Renamed: *Seat Taper Angle* to *Seat Taper Width*	Developer
	Renamed: *Seat Angle* to *Seat Tilt Angle*	Developer
	Renamed: *Back Angle* to *Back-Seat Angle*	Developer
	Renamed: *Surface* to *Panel*	Developer

	Renamed: *Rear* to *Back*	Developer
	Renamed: *Seat Lengthwise* to *Seat Long Rail*	Developer
	Renamed: *X Rail* to *Radial Rail*	Developer
	Renamed: *Radius* to *Diameter*	Developer
	Renamed: Change the order of words (e.g. *Leg Front* to *Front Leg*)	Developer
	Renamed: Add the word Rail (e.g. *Seat Front* to *Seat Front Rail*)	Developer
	Renamed: Tab *Guides* to *Display*	Developer
(values)	Range of Leg Angles: -100-100 (V1.1: 0-45), in order to incorporate inward angles	**Evaluation 1**
	Range of Sections: 1-280 (V1.1: 1-25 for Round Sections and 1-00 for Square Sections)	Developer
	Anthropometric ranges reference: Tilley 2002 (V1.1: Panero 1998, rounded to multiples of ten). The problem was that most chairs of the sample did not fit into the ranges: from the sample of 26 chairs, 18 did not fit in the range (78%) of Seat Height (406-432).	Developer
	Ranges of Back Spacing & Arms Depth: were edited to include anthropometric ranges	Developer
	Default value of Sections: 30 (V1.1: 5 for Round Sections, 6x8 for Square Sections)	Developer
	Default value of Panels: 10 (V1.1: 2)	Developer
	Default value of Guides: checked (V1.1: unchecked)	Developer
	Default value of Section: Round (V1.1: none)	Developer
(units)	Units of Arms Depth: percentage (V1.1: millimetres)	Developer
	Units of Legs Angles: percentage (V1.1: degrees)	Developer
Rules	Referential of Legs Spacing (at top): origin in the corner of the Seat Guides; axis is the perimeter of Seat Guides (for negative values). V1.1: origin in the centre of the seat or in the corner of Seat Guides when the option "Legs in Seat Box" was active).	**Evaluation 1**
	Referential of Legs Angles (at bottom): the Base Corners, so that we could easily define the angles of the front leg of the Zig-Zag (0, -100) and of S chair (-50, -50); (V1.1: measured from the vertical, although they should be measured in relation to the Seat Panel; the maximum angle was the highest in the sample - 45° in Zig Zag chair).	Developer
	Referential of Arm Support Front/Back (at top): in the endpoints of the Armrest (V1.1: the angles were the same as the legs, although there was a bug)	Developer
	Referential of Arms Height: perpendicular to the Seat Panel (V1.1: vertical)	Developer
	Seat Long: connects curves (V.1.1: connected linear segments)	Developer
	The absolute origin is in the horizontal projection of the midpoint of the Seat Guides front edge (V1.1: in the front left corner of the base)	Developer
Interface	The Guides sliders were distributed into the Seat and Back tabs	**Evaluation 1**
	The performance of ChiarDNA was significantly improved (but still not enough)	**Evaluation 1**
	The sliders were aligned	Developer
	The initial state automatically centres the visible objects in the Rhino window	Developer
REMOVED		
Parameters	Seat Side Depth and Base Side Depth	**Evaluation 1 (PT)**
Rules	Legs in Seat Box	**Evaluation 1**
	Seat Box	**Evaluation 1**
	Seat X-Box (connected Legs with Seat Box). Note that this rule could not reproduce Morrison's HAL chair, as the Seat Outer Frame could not be smaller than the Seat Surface	**Evaluation 1**
	Seat Surface Box, Seat Surface Side, Back Surface Upright (now the Seat and Back Panels follow the shape of to the Guides)	Developer
	Back Upright Arm (was incorporated in Back Upright), and Back Cross Arm (was incorporated in Back Top Rail)	Developer
ADDED		
Parameters	Solid Mode parameters applied to 12 frame groups (2 Legs, 5 Outer Frames, 5 Inner frames) and 6 Panels, totalizing **56** variables (V1.1: the Solid Mode parametrs were applicable to all the parts, controlled by **5** variables)	**Evaluation 1**
	Guides corner radius in Back, Stretchers, Base, and Arms (V1.1: only available in the Seat)	**Evaluation 1**
	Taper in Back (V1.1: only available in the Seat)	**Evaluation 1**
	Tilt Angle in Stretchers & Arms	**Evaluation 1**
	Legs Taper Ratio Note that the section is an ellipse and oblique legs are in full contact with the ground (as in DCW and 214), but in V1.1 the section is a circle and oblique legs were not in full contact with the ground (as in chairs DAX and Ant)	**Evaluation 1**
	Seat and Back Cross/Long Rails Number	Developer
	Radial Rails Number	Developer
	Back Width	Developer
	Back Upright Height	Developer
	Overall measures (only visible for the Racket window)	Developer
Rules	Back Radial Rail	**Evaluation 1 (PT)**
	Panels of Legs, Stretchers, Base, and Arms (V1.1 only had Seat and Back Panels). Note that panels can be simulated by stretching the frame to larger dimensions, but the effect wouldn't be the same.	**Evaluation 1**
	Outer Frame rules to follow the shape of the Guides when the Legs are in their perimeter or in the Cross/Long rail (for S chair), otherwise it connects the legs.	**Evaluation 1**

	V1.1: there were two options to insert the Seat Outer Frame: Front/Back/Side Rails (that connected the legs) or "Seat Box" (which placed all the Outer Frame parts with the shape of the Guides)	
	Joints in Outer Frame corners (when the radius is 0)	**Evaluation 1**
	Back Splat from the Seat Long Rail	**Evaluation 1**
	Guides of Legs, Seat, Back, Stretchers and Base (V1.1: the Guides manipulated simultaneously Legs, Seat, Back and Base Guides; and Arms Guides was an independent checkbox)	Developer
	Long Stretcher and Long Base Rail	Developer
	Back Bottom Rail	Developer
	Cross rails from Long Rails	Developer
	The Radial Rails can be used with 4 Legs – diagonal rail, 3 Legs – centre rail, or 1 Leg – star rail (V1.1: the X Rails were limited to 4 Legs)	Developer
	Rules when parts of the LHS are not coplanar with the areas of the parts of the RHS: Back Splat from Seat Back (when Seat Back is not coplanar with Back area); Back Upright and Back Top from Armrest (when Armrest endpoint is not in Back area); Back Upright from Back Leg (when Back Leg is not coplanar with Back area); Arm Support Back/Front from Legs (when Legs are not coplanar with Arm area)	Developer
	Arm Support Side from Front/Back Leg (for Wishbone chair)	Developer
Language	Added other chair types, as the pedestal base chair	**Evaluation 1**
Commands	File Menu: New, Open, Save	**Evaluation 1**
	Templates library	Developer
	Random: random all parameters but only accepts “valid chairs”, which have: (1) Seat Panel, (2) at least one Leg (Front Leg or Back Leg or Leg Panels); and (3) at least one element in the Back (Back Panel or Back Upright and Back Top or Back Cross or Back Bottom)	Developer
Interface	Numerical input for each slider (text-field)	**Evaluation 1**
	Window: vertical scrollbar	Developer

	Evaluation 1	**Developer**	**TOTAL**
Bugs	7	8	**15**
Edit	5	29	**34**
Remove	4	2	**6**
Add	13	15	**28**
TOTAL	**29**	**54**	**83**

Appendix 6.D.3 Recommendations List

Topic	Recommendation	Source	Priority
BUGS	If the number inserted in the text-field is not in the parametric range, the system returns the last valid value. But text-fields are constantly triggering an action, instead of only after the user presses the Enter key	**Evaluation 2**	High
	Radio-box of Mode switches from Solid to Wireframe without clicking (when: check any checkbox in wireframe mode, active the Solid Mode, select any element in Rhino, and change tab)	**Evaluation 2**	High
	Leg Taper Ratio did not actualize after selecting the New command	**Evaluation 2**	High
	Error when unchecking the Arm Side Support (with the Armrest and the Back Top Rail placed)	**Evaluation 2**	High
	Interface: The Diameter of the Inner Sections is not hidden by default. Moreover, the Seat Cross, Long and Radial are enabling the slider of the Seat Inner diameter unnecessarily.	**Evaluation 2**	High
	The joints of Seat Outer Frame are out of place (when the Seat Outer Frame is connecting the Legs)	**Evaluation 2**	High
	There is no feedback when the user changes the Section parameters in the Wireframe Mode	**Evaluation 2**	High
	The Back Leg Taper Ratio, when the Back Upright is placed, does not produce any effect	**Evaluation 2**	High
	The Arm Back Support and the Arm Side Support can be simultaneously extended from the Back Leg	**Evaluation 2**	High
	The leg extensions (Back Upright, Arm Supports) create duplicated lines in legs	**Evaluation 2**	High
	Panels are not placed below the Guides and thus are changing the real dimensions (e.g. currently the Seat Height is being wrongly increased by half of the Seat Outer Frame Height plus the Seat Panel Thickness)	**Evaluation 2**	High
	Stretchers guides: GPF is not coincident with GF (the centers of the corner radius should not be ruled by the circumcenter).	**Evaluation 2**	High
	The Back Cross Rail cannot be placed in the round part of the Back Top Rail	**Evaluation 2**	High
	The Long Rails Number cannot be 1 (although a single rail can be obtained when 2 rails overlap in the centre)	**Evaluation 2**	Medium
	Error when Seat Taper Width is 100	Developer	High
	The angled legs section is oval, unlike the other sections (which are round)	Developer	Medium
	The mirror is causing two problems: duplicate lines coplanar to the symmetry plane, and broken lines perpendicular to the symmetry plane	Developer	Medium
	The Arm area does not match a tilted Back Area	Developer	Medium
	The Back Splat, when connecting the Seat Back and the Back Top Rail and when the number is higher than 2, crosses the rails	Developer	Medium
	The Radial Rail number should only be available in the 'star' case	Developer	Medium
	Stretchers & Base Radial: they depend on the position of the legs in the seat plane (they should depend on the legs position in their respective planes)	Developer	Medium
EDIT			
Parameters	Replace relative units (percentages) by absolute units (millimetres and degrees)	**Evaluation 2**	High
	Decrease the Legs Angles maximum limit	**Evaluation 2**	High
	Increase the Back Width maximum limit	**Evaluation 2**	High
	Switch the Back Height Spacing for the Back Panel Height	**Evaluation 2**	Medium
	Switch the positive with the negative in the Guides Taper Width	**Evaluation 2**	Medium
	Decrease the Section maximum limit (e.g. 30 in Sections beyond the Legs)	Developer	High
	Verify whether the default value of anthropometric measures is considered preferred value (not necessarily in the middle of the range)	Developer	Low
Rules	Review dependencies, to allow a different order of placement of parts (e.g. from inner to outer frame – Base of S chair; from Back Upright to the Back Legs)	**Evaluation 2**	Medium
	Other approach: increase the abstraction level; e.g. replace Front and Back Legs by Legs	Developer	Low
Commands	Random: reduce the spectrum of solutions, by (1) restrain ranges (e.g. leg spacing, angles and sections); (2) ensure that chairs are stable (e.g. place a base for one- or two-legged chairs); (3) ensure that all the parts are connected; (4) ensure that it respects the precedents (there are several results that produce an error, e.g., rules SF2, SB2, SS2 without LF or LR); (5) generate solutions in the solid mode. Redefine the termination rule ('valid' chair): does not need the Back Upright or the Back Bottom; and can finish witout a Seat Panel but a Seat Cross or Seat Long. Include a random mode within style restrictions	**Evaluation 2**	High

Interface	Improve the performance of ChairDNA	**Evaluation 1, Evaluation 2**	High
	Give the File menu more visibility	**Evaluation 2**	High
	Display a different shaded area for each collapsible menu	**Evaluation 2**	High
	Reorder checkboxes: move Panels to the top of the windows	**Evaluation 2**	High
	Reorder tabs: Seat could come before the Legs	**Evaluation 2**	Low
	Reorder Legs sliders: to be consistent should be in the Leg Guides checkbox (because to change parameters of Leg Panels on need to insert/delete the Leg Frame)	Developer	Low
ADD			
Parameters	Display the overall dimensions of the chair (currently visible in the Racket window)	**Evaluation 2**	High
	Distinct parameters for the Outer Frame (different from the ones of Panels); to avoid the obligatoriness of the Legs Spacing to be zero to obtain a curved Seat Outer Frame; and to reproduce for e.g. the Seat Side Depth of the Polyside chair	**Evaluation 2**	High
	Radius between parts of different groups (e.g. Back Cross Arm) and in inner frame corners	**Evaluation 1, Evaluation 2**	High
	Bézier curves, preferably in Back/Seat Panels (e.g.: back profile curvature – lumbar, thoracic, border; seat profile curvature – buttocks, hips, border) and in Legs (to make sabre, cabriole and serpentine legs)	**Evaluation 1, Evaluation 2**	High
	Mesh Panel	**Evaluation 2**	Medium
	Quantities (e.g. Leg Number) beyond Seat/Back Inner Frame	**Evaluation 1, Evaluation 2**	Medium
	Square Section Rotation Angle	**Evaluation 1**	Low
	Section shapes beyond round and square (e.g. oval, and hollow)	**Evaluation 2**	Low
	Legs Height	Developer	Low
	Arm Guides Width Spacing	Developer	Low
	Radial Rail Distance (instead of just connect the corners of the Outer Frame, it could connect any point of the Outer Frame with the centre)	Developer	Low
Rules	Align options of solid parts (e.g. Stretchers Outer Frame can be placed outward, inward or between the Legs)	**Evaluation 2**	High
	Joints (when radius is 0) between parts of different groups; clue: represent the chair as a graph, placing spheres (for round sections) or boxes (for square sections) in all the vertexes that have at least 2 edges connected to it	**Evaluation 1, Evaluation 2**	High
	Options to create relations (e.g. Back Leg parameters to match the Front Leg parameters; Base Guides and Stretchers Guides to match Seat Guides) and freeze relations (e.g. Back Angle to be independent from the Seat Angle)	**Evaluation 2**	High
	Back Top Rail from the Back Splat	**Evaluation 2**	Low
	Back Upright from the extension of the Back Legs, with the Armrests placed	Developer	Medium
Language	Further multipurosie chair types (asymmetric chairs; high-back chairs; chairs with more than four linear legs)	**Evaluation 2**	Medium
	Futher chair types (e.g. lounge chairs and children chairs)	**Evaluation 1, Evaluation 2**	High
	Futher furniture types (e.g. dining tables)	**Evaluation 2**	Medium
Commands	Compatibility with Mac OS X operating system	**Evaluation 1**	Medium
	Undo command	**Evaluation 2**	High
	Library of detail components (e.g. woodworking joints, hardware items)	**Evaluation 2**	Medium
	Library of materials (including finishes comprising colour and texture)	**Evaluation 2**	Medium
	Templates: create guides Templates for different types of chairs (e.g. stacking chair, children's chair) and/or different types of parts (e.g. low back chair)	**Evaluation 2**	Medium
	Analysis tools (e.g. structural analysis, stability and strength) and simulation tools (e.g. tilt movement; folding movement)	**Evaluation 2**	Low
	Fabrication tools: automate the fabrication process (e.g. export constructible components for CNC machines)	**Evaluation 2**	Low
	Templates: design styles (implmenentation of specific grammars)	Developer	Medium
	Templates: generate a hybrid design between 2 designs	Developer	Medium
	Goal-oriented automatic generation (e.g. with the goal of reducing weight)	Developer	Low
	Import designs from a 3D model, by shape recognition (automatically extract values from a 3D model), which could trigger an automatic generation of rules	Developer	Low
Interface	Icons (which could be optional)	**Evaluation 2**	High
	Progress indicator, i.e., a feedback when loading	**Evaluation 2**	High
	Manipulate the shape directly in the 3D model (by dragging points)	**Evaluation 2**	Medium
	Approximate the interaction to the gesture of drawing (clue: allow the user to 'draw' in the model, by detecting key points)	**Evaluation 2**	Low
	Allow the scroll wheel to move sliders and to move down the scrollbar	**Evaluation 2**	Medium

	Tooltips (indicating how the checkboxes get enabled)	**Evaluation 1**	Medium
	Interface customization (e.g. where the user can change the variables names and the ranges) and other back-ends (e.g. Solid Works)	Developer	Low

	Evaluation 1	**Evaluation 2**	**Evaluation 1, Evaluation 2**	**Developer**	**TOTAL**
Bugs	0	14	0	7	**21**
Edit	0	11	1	4	**16**
Add	3	20	5	9	**37**
TOTAL	**3**	**45**	**6**	**20**	**74**

Appendix 6.E Templates

Appendix 6.E.1 Grammars

	DCG	JCG	TCG	ICG	DJCG	DJHG	SCG	MCG
Guides	VX	VX	VX	VX	VX	VX	XX	VX
Mode	VX	VX	VX	VX	VX	VX	XX	VX
Legs Guides	VX	VX	VX	VX	VX	VX	XX	VX
Front Leg	VV	VV	VV	VX	VV	VV	XX	VX
Width Spacing	[-10,1]	[-30,0]	N/A	[-100,1]	[-10,0]	[-30,1]	]1,100]	[-100,100]
Depth Spacing	[-35,-5]	[-40,0]	N/A	[-100,0]	[-35,-5]	[-40,0]	]0,100]	[-100,100]
Splay Angle	N/A	[0,10]	N/A	[-59,65]	0	[0,10]	[-100,-59[,]65,100]	[-100,100]
Rake Angle	N/A	[0,15]	N/A	[-100,70]	0	[0,15]	]70,100]	[-100,100]
Section	XX	VX	VV	VX	XX	VX	XX	VX
Diameter	N/A	[25,35]	33	[15,60]	30	[25,35]	[1,15[,]60,280]	[1,280]
Width	[22,60]	[20,30]	N/A	[12,60]	[22,30]	[20,60]	[1,12[,]60,280]	[1,280]
Depth	[25,100]	[25,30]	N/A	[9,76]	[25,30]	[25,100]	[1,9[,]100,280]	[1,280]
Taper Ratio	N/A	[80,100]	60	[50,100]	100	[80,100]	[1,50[	[1,100]
Back Leg	VV	VV	VV	VX	VV	VV	XX	VX
Width Spacing	[-100,1]	[-30,12]	N/A	[-100,40]	[-30,1]	[-100,12]	]40,100]	[-100,100]
Depth Spacing	N/A	[-25,0]	N/A	[-100,0]	0	[-25,0]	]0,100]	[-100,100]
Splay Angle	N/A	[0,15]	8	[-27,65]	0	[0,15]	[-100,-27[,]65,100]	[-100,100]
Rake Angle	N/A	[15,33]	22	[-44,90]	[0,15]	[0,33]	[-100,-44[,]90,100]	[-100,100]
Section	XX	VX	VV	VX	XX	VX	XX	VX
Diameter	N/A	[25,35]	25	[15,60]	30	[25,35]	[1,15[,]60,280]	[1,280]
Width	[25,120]	[20,30]	N/A	[12,60]	[25,30]	[20,120]	[1,12[,]120,280]	[1,280]
Depth	[20,80]	[25,30]	N/A	[11,76]	[25,30]	[20,80]	[1,11[,]80,280]	[1,280]
Taper Ratio	N/A	[80,100]	84	[50,100]	100	[80,100]	[1,50[	[1,100]
Leg Front Panel	XX	XX	XX	VX	XX	XX	XX	VX
Leg Back Panel	XX	XX	XX	XX	XX	XX	VX	VX
Leg Side Panel	XX	XX	XX	XX	XX	XX	VX	VX
Leg Radial Panel	XX	XX	XX	XX	XX	XX	VX	VX
Thickness	N/A	N/A	N/A	[5,25]	N/A	N/A	[1,5[,]25,100]	[1,100]
Seat Guides	VX	VX	VX	VX	VX	VX	XX	VX
Width	[470,560]	[406,489]	406	[406,560]	[470,489]	[406,560]	N/A	[406,560]
Depth	[409,473]	[406,453]	406	[406,489]	[409,453]	[406,473]	]489,508]	[406,508]
Height	[427,470]	[435,475]	434	[400,475]	[435,470]	[427,475]	[368,400[,]475,480]	[368,480]
Tilt Angle	[1,5]	[0,3]	N/A	[0,5]	[1,3]	[0,5]	N/A	[0,5]
Front Radius	[0,12]	[0,60]	43	[0,100]	[0,12]	[0,60]	N/A	[0,100]
Rear Radius	[0,100]	[0,80]	89	[0,100]	[0,80]	[0,100]	N/A	[0,100]
Taper Width	N/A	[0,15]	13	[0,74]	0	[0,15]	]74,100]	[0,100]
Seat Front Rail	VV	VX	VV	VX	VX	VX	XX	VX
Seat Back Rail	VX	VX	VV	VX	VX	VX	XX	VX
Seat Side Rail	VX	VX	VV	VX	VX	VX	XX	VX
Outer Frame Section	XX	VX	XX	VX	XX	VX	XX	VX
Diameter	N/A	[20,30]	N/A	[15,30]	30	[20,30]	[1,15[,]30,280]	[1,280]
Width/Depth	[22,100]	[10,30]	27	[10,45]	[22,30]	[10,100]	[1,10[,]100,280]	[1,280]
Height	[25,80]	[30,50]	38	[4,70]	[30,50]	[25,80]	[1,4[,]80,280]	[1,280]
Seat Cross Rail	VX	VX	XX	VX	VX	VX	XX	VX
Depth Spacing	N/A	N/A	N/A	[1,90]	N/A	N/A	]90,99]	[1,99]
Number	N/A	N/A	N/A	N/A	N/A	N/A	]1,12]	[1,12]
Seat Long Rail	VX	VX	XX	VX	VX	VX	XX	VX
Width Front Spacing	[0,80]	[0,50]	N/A	[0,50]	[0,50]	[0,80]	]80,100]	[0,100]

Width Rear Spacing	[50,80]	[0,50]	N/A	[0,50]	50	[0,80]	]80,100]	[0,100]
Number	N/A	N/A	N/A	N/A	N/A	N/A	]2,12]	[2,12]
Seat Radial Rail	XX	VX	XX	VX	XX	VX	XX	VX
Number	N/A	N/A	N/A	[3,4]	N/A	N/A	]4,5]	[3,5]
Inner Frame Section	XX	VX	VV	VX	XX	VX	XX	VX
Diameter	N/A	[20,30]	N/A	[15,30]	30	[20,30]	[1,15[,]30,280]	[1,280]
Width/Depth	[20,100]	[20,40]	N/A	[20,120]	[20,40]	[20,100]	[1,20[,]120,280]	[1,280]
Height	[25,100]	[20,30]	N/A	[4,30]	[25,30]	[20,100]	[1,4[,]100,280]	[1,280]
Seat Panel	VV	VV	VV	VX	VV	VV	XX	VX
Thickness	[20,40]	[3,10]	5	[2,80]	[10,20]	[3,40]	[1,2[,]80,100]	[1,100]
Back Guides	VX	VX	VX	VX	VX	VX	XX	VX
Height	[330,483]	[330,387]	406	[330,594]	[330,387]	[330,483]	]594,635]	[330,635]
Height Spacing	[0,195]	[0,200]	[101,200]	[0,190]	[0,195]	[0,200]	N/A	[0,200]
Back-Seat Angle	[93,96]	[94,96]	105	[92,105]	[94,96]	[93,96]	[90,92[	[90,105]
Top Radius	[0,12]	[0,30]	50	[0,100]	[0,12]	[0,30]	N/A	[0,100]
Bottom Radius	N/A	[0,50]	83	[0,85]	0	[0,50]	]85,100]	[0,100]
Width	N/A	[0,100]	N/A	N/A	50	[0,100]	N/A	[0,100]
Taper Width	N/A	N/A	-47	[-100,30]	N/A	N/A	]30,100]	[-100,100]
Back Upright	VX	VX	VV	VX	VX	VX	XX	VX
Height	[50,100]	[50,100]	N/A	[70,100]	[50,100]	[50,100]	[1,50[	[1,100]
Back Top Rail	VX	VX	VV	VX	VX	VX	XX	VX
Back Bottom Rail	XX	XX	VX	XX	XX	XX	XX	VX
Outer Frame Section	VX	VX	VV	VX	VX	VX	XX	VX
Diameter	N/A	N/A	25	[15,30]	N/A	N/A	[1,15[,]30,280]	[1,280]
Width/Height	[30,120]	[15,30]	N/A	[10,30]	30	[15,120]	[1,10[,]120,280]	[1,280]
Depth	[20,30]	[20,30]	N/A	[4,60]	[20,30]	[20,30]	[1,4[,]60,280]	[1,280]
Back Cross Rail	XX	XX	VX	VX	XX	XX	XX	VX
Height	N/A	N/A	[75,99]	[50,99]	N/A	N/A	[1,50[	[1,99]
Number	N/A	N/A	N/A	[1,2]	N/A	N/A	]2,12]	[1,12]
Back Splat	XX	XX	VX	VX	XX	XX	XX	VX
Width Top Spacing	N/A	N/A	[50,100]	[18,50]	N/A	N/A	[0,18[,]50,100]	[0,100]
Width Bottom Spacing	N/A	N/A	[13,38]	[0,80]	N/A	N/A	]80,100]	[0,100]
Number	N/A	N/A	N/A	[2,4]	N/A	N/A	]4,12]	[2,12]
Back Radial Rail	XX	XX	XX	VX	XX	XX	XX	VX
Inner Frame Section	VV	VV	VV	VX	VV	VV	XX	VX
Diameter	N/A	N/A	17	[8,30]	N/A	N/A	[1,8[,]30,280]	[1,280]
Width/Height	N/A	N/A	N/A	[24,120]	N/A	N/A	[1,24[,]120,280]	[1,280]
Depth	N/A	N/A	N/A	[4,30]	N/A	N/A	[1,4[,]30,280]	[1,280]
Back Panel	VX	VX	VX	VX	VX	VX	XX	VX
Thickness	[10,25]	[6,12]	5	[2,40]	[10,12]	[6,25]	[1,2[,]40,100]	[1,100]
Stretchers Guides	XX	VX	VX	VX	XX	VX	XX	VX
Height	N/A	[50,75]	77	[5,85]	50	[50,75]	[1,5[,]85,99]	[1,99]
Tilt Angle	N/A	N/A	N/A	[-100,85]	N/A	N/A	]85,100]	[-100,100]
Front Radius	N/A	N/A	48	[0,48]	N/A	N/A	]48,100]	[0,100]
Rear Radius	N/A	N/A	58	[0,58]	N/A	N/A	]58,100]	[0,100]
Front Stretcher	XX	XX	VV	VX	XX	XX	XX	VX
Height	N/A	N/A	N/A	[0,25]	N/A	N/A	[-100,0[,]25,100]	[-100,100]
Back Stretcher	XX	VX	VV	VX	XX	VX	XX	VX
Height	N/A	[-15,0]	N/A	[-25,25]	0	[-15,0]	[-100,-25[,]25,100]	[-100,100]
Side Stretcher	XX	VX	VV	VX	XX	VX	XX	VX
Outer Frame Section	VV	VV	VV	VX	VV	VV	XX	VX
Diameter	N/A	[25,30]	17	[10,30]	30	[25,30]	[1,10[,]30,280]	[1,280]
Width/Depth	N/A	N/A	N/A	[10,30]	N/A	N/A	[1,10[,]30,280]	[1,280]
Height	N/A	N/A	N/A	[30,40]	N/A	N/A	[1,30[,]40,280]	[1,280]
Cross Stretcher	XX	VX	XX	VX	XX	VX	XX	VX

Depth Spacing	N/A	[25,50]	N/A	[1,50]	50	[25,50]	]50,99]	[1,99]
Long Stretcher	XX	XX	XX	XX	XX	XX	VX	VX
Width Front Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Width Rear Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Radial Stretcher	XX	XX	XX	VX	XX	XX	XX	VX
Inner Frame Section	VV	VV	VV	VV	VV	VV	XX	VX
Diameter	N/A	[25,30]	N/A	[10,30]	30	[25,30]	[1,10[,]30,280]	[1,280]
Width/Depth	N/A	N/A	N/A	N/A	N/A	N/A	[1,30[,]30,280]	[1,280]
Height	N/A	N/A	N/A	N/A	N/A	N/A	[1,30[,]30,280]	[1,280]
Stretchers Panel	XX	XX	XX	XX	XX	XX	VX	VX
Thickness	N/A	N/A	N/A	N/A	N/A	N/A	[1,10[,]10,100]	[1,100]
Base Guides	VX	XX	XX	VX	XX	VX	XX	VX
Width	N/A	N/A	N/A	[70,100]	N/A	N/A	[1,70[	[1,100]
Depth	[98,100]	N/A	N/A	[59,100]	100	[98,100]	[1,59[	[1,100]
Front Radius	N/A	N/A	N/A	[0,100]	N/A	N/A	N/A	[0,100]
Rear Radius	N/A	N/A	N/A	[0,100]	N/A	N/A	N/A	[0,100]
Base Front Rail	XX	XX	XX	VX	XX	XX	XX	VX
Base Back Rail	XX	XX	XX	VX	XX	XX	XX	VX
Base Side Rail	VX	XX	XX	VX	XX	VX	XX	VX
Outer Frame Section	VX	VV	VV	VX	VX	VX	XX	VX
Diameter	N/A	N/A	N/A	[20,30]	N/A	N/A	[1,20[,]30,280]	[1,280]
Width/Depth	[25,30]	N/A	N/A	N/A	30	[25,30]	[1,25[,]30,280]	[1,280]
Height	[30,80]	N/A	N/A	[18,30]	30	[30,80]	[1,18[,]80,280]	[1,280]
Base Cross Rail	XX	XX	XX	VX	XX	XX	XX	VX
Depth Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[1,50[,]50,99]	[1,99]
Base Long Rail	XX	XX	XX	XX	XX	XX	VX	VX
Width Front Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Width Rear Spacing	N/A	N/A	N/A	N/A	N/A	N/A	[0,50[,]50,100]	[0,100]
Base Radial Rail	XX	XX	XX	VX	XX	XX	XX	VX
Number	N/A	N/A	N/A	[3,4]	N/A	N/A	]4,5]	[3,5]
Inner Frame Section	VV	VV	VV	VX	VV	VV	XX	VX
Diameter	N/A	N/A	N/A	[25,30]	N/A	N/A	[1,25[,]30,280]	[1,280]
Width/Depth	N/A	N/A	N/A	[28,30]	N/A	N/A	[1,28[,]30,280]	[1,280]
Height	N/A	N/A	N/A	[9,30]	N/A	N/A	[1,9[,]30,280]	[1,280]
Base Panel	XX	XX	XX	VX	XX	XX	XX	VX
Thickness	N/A	N/A	N/A	[10,25]	N/A	N/A	[1,10[,]25,100]	[1,100]
Arms Guides	VX	VX	XX	VX	VX	VX	XX	VX
Height	[191,223]	[223,254]	N/A	[191,241]	223	[191,254]	N/A	[191,254]
Depth	[66,100]	[20,100]	N/A	[0,100]	[66,100]	[20,100]	N/A	[0,100]
Depth Rear Spacing	[0,18]	[0,10]	N/A	[0,80]	[0,10]	[0,18]	]80,100]	[0,100]
Tilt Angle	N/A	[-27,0]	N/A	[-53,20]	0	[-27,0]	[-100,-53[,]20,100]	[-100,100]
Front Radius	N/A	N/A	N/A	[0,41]	N/A	N/A	]41,100]	[0,100]
Rear Radius	N/A	N/A	N/A	[0,30]	N/A	N/A	]30,100]	[0,100]
Arm Front Support	VX	XX	XX	VX	XX	VX	XX	VX
Arm Back Support	VX	XX	XX	VX	XX	VX	XX	VX
Armrest	VX	VX	XX	VX	VX	VX	XX	VX
Outer Frame Section	VX	VV	VV	VX	VX	VX	XX	VX
Diameter	N/A	[25,30]	N/A	[15,30]	30	[25,30]	[1,15[,]30,280]	[1,280]
Width	[20,60]	N/A	N/A	[30,50]	30	[20,60]	[1,20[,]60,280]	[1,280]
Depth/Height	[25,100]	N/A	N/A	[8,30]	30	[25,100]	[1,8[,]100,280]	[1,280]
Arm Side Support	XX	VX	XX	VX	XX	VX	XX	VX
Depth Top Spacing	N/A	[46,50]	N/A	[0,50]	50	[46,50]	]50,100]	[0,100]
Depth Bottom Spacing	N/A	N/A	N/A	[50,100]	N/A	N/A	[0,50[	[0,100]
Section	VV	VV	VV	VV	VV	VV	XX	VX
Diameter	N/A	[25,30]	N/A	N/A	30	[25,30]	[1,25[,]30,280]	[1,280]

Width	N/A	N/A	N/A	N/A	N/A	N/A	[1,30[,]30,280]	[1,280]
Depth	N/A	N/A	N/A	N/A	N/A	N/A	[1,30[,]30,280]	[1,280]
Arm Panel	XX	XX	XX	VX	XX	XX	XX	VX
Thickness	N/A	N/A	N/A	[5,10]	N/A	N/A	[1,5[,]10,100]	[1,100]

TOTALS

	Specific				**Common**	**Hybrid**	**Synthetic**	**Generic**
	DCG	**JCG**	**TCG**	**ICG**	**DJCG**	**DJHG**	**SCG**	**MCG**
RULES VV	**9**	**10**	**22**	**2**	**8**	**8**	**N/A**	**N/A**
RULES VX	**21**	**26**	**10**	**50**	**18**	**32**	**6**	**N/A**
RULES VX/VV	**30**	**36**	**32**	**52**	**26**	**40**	**6**	**59**
%	**51**	**61**	**54**	**88**	**44**	**68**	**10**	**100**
Legs	3	5	5	6	3	5	3	9
Seat	7	10	6	10	7	10	0	10
Back	6	6	9	9	6	6	0	10
Stretchers	2	6	6	8	2	6	2	10
Base	4	2	2	9	2	4	1	10
Arms	6	5	2	8	4	7	0	8
Solid Mode (display)	2	2	2	2	2	2	0	2
Termination	0	0	0	0	0	0	0	0
PARAMETERS VV	**0**	**0**	**27**	**0**	**30**	**0**	**0**	**0**
PARAMETERS VX (range)	**36**	**54**	**4**	**88**	**29**	**59**	**92**	**103**
PARAMETERS VX/VV	**36**	**54**	**31**	**88**	**59**	**59**	**92**	**103**
%	**35**	**52**	**30**	**85**	**57**	**57**	**89**	**100**
Legs	23	21	21	20	23	21	23	17
Seat	23	20	24	20	23	20	30	20
Back	24	24	21	21	24	24	30	20
Stretchers	24	20	20	18	24	20	24	16
Base	21	23	23	16	23	21	24	15
Arms	17	18	21	15	19	16	23	15
Solid Mode	0	0	0	0	0	0	0	0
Termination	0	0	0	0	0	0	0	0

Appendix 6.E.2 Designs

Table 3 Daciano da Costa Designs

	DC					DE	DN	
	DC1	**DC2**	**DC3**	**DC4**	**DC5**	**DE6**	**DN7**	**DN8**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	-1	1	1	0	-10	-9	0	-1
Depth Spacing	-20	-35	-25	-5	-13	0	-1	-5
Splay Angle	0	0	0	0	0	0	0	0
Rake Angle	0	0	0	0	0	0	0	0
Section	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width	60	25	25	25	22	50	25	22
Depth	25	100	80	50	83	20	30	40
Taper Ratio	100	100	100	100	100	100	100	100
Back Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	-30	-100	1	0	-100	-9	-50	-10
Depth Spacing	0	0	0	0	0	1	0	0
Splay Angle	0	0	0	0	0	0	0	0
Rake Angle	0	0	0	0	0	0	0	0
Section	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width	25	120	25	50	115	50	25	40
Depth	60	25	80	25	20	20	30	22
Taper Ratio	100	100	100	100	100	100	100	100
Leg Front Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10
Seat Guides	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Width	555	560	560	540	470	451	470	480
Depth	465	456	473	459	409	406	470	450
Height	427	470	431	450	440	430	445	430
Tilt Angle	3	3	5	2	1	1	1	2
Front Radius	12	10	5	0	10	5	0	0
Rear Radius	0	100	0	100	100	5	100	100
Taper Width	0	0	0	0	0	0	0	0
Seat Front Rail	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Seat Back Rail	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
Seat Side Rail	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE
Outer Frame Section	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	25	100	25	30	22	50	25	22
Height	60	25	80	60	77	20	30	40
Seat Cross Rail	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Depth Spacing	75	50	50	50	50	80	50	50
Number	1	1	1	1	1	2	1	1
Seat Long Rail	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
Width Front Spacing	50	0	80	0	0	50	50	50
Width Rear Spacing	50	50	80	50	50	50	50	50
Number	2	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4

Inner Frame Section	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	25	100	25	20	22	20	30	22
Height	60	25	30	100	100	20	30	40
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	25	40	20	20	20	10	20	20
Back Guides	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE
Height	381	483	381	330	330	330	380	330
Height Spacing	0	0	0	195	0	0	195	180
Back-Seat Angle	95	95	96	93	95	91	93	94
Top Radius	12	0	5	0	0	0	0	10
Bottom Radius	0	0	0	0	0	0	0	0
Width	50	50	50	50	50	50	30	50
Taper Width	0	0	0	0	0	0	0	0
Back Upright	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE
Height	50	100	100	50	100	100	100	100
Back Top Rail	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width/Height	30	120	30	50	120	50	30	25
Depth	30	25	30	25	20	20	30	30
Back Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1	1
Back Splat	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	50	50	50	50	50	50
Width Bottom Spacing	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Height	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30
Back Panel	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
Thickness	25	10	20	20	10	10	15	20
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	50	10	50	50
Tilt Angle	0	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0
Front Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0
Back Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0
Side Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	50	30	30
Height	30	30	30	30	30	20	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100	100
Depth	100	100	98	100	100	100	100	100
Front Radius	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
Outer Frame Section	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	30	30	25	30	30	30	25	25
Height	30	30	80	30	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30
Base Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	191	215	223	223	223	223	210
Depth	66	66	80	100	100	100	100	94
Depth Rear Spacing	0	0	18	0	0	0	0	100
Tilt Angle	0	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0
Arm Front Support	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
Arm Back Support	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
Armrest	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
Outer Frame Section	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
Diameter	30	30	30	30	30	30	30	30
Width	60	25	25	20	30	30	30	22
Depth/Height	25	100	80	100	30	30	30	40
Arm Side Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10

Table 4 Jasper Morrison Designs

	JC					JE	JN	
	JC1	**JC2**	**JC3**	**JC4**	**JC5**	**JE6**	**JN7**	**JN8**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	0	-15	-30	0	0	-5	0
Depth Spacing	0	0	-10	-40	0	-1	-5	-40
Splay Angle	0	5	0	10	0	0	5	5
Rake Angle	0	5	5	15	0	0	5	15
Section	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
Diameter	30	30	25	35	30	30	25	25
Width	20	25	30	30	30	40	20	30
Depth	30	25	30	30	30	15	25	30
Taper Ratio	90	100	100	100	80	100	80	80
Back Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	-10	12	-30	0	0	-25	12
Depth Spacing	0	0	-15	-25	0	0	-24	-24
Splay Angle	0	15	3	10	0	0	15	15
Rake Angle	15	15	33	15	15	-10	30	30
Section	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
Diameter	30	30	25	35	30	30	25	25
Width	20	25	30	30	30	40	20	30
Depth	30	25	30	30	30	15	25	30
Taper Ratio	100	100	100	100	80	100	80	100
Leg Front Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	406	415	489	475	438	406	460	470
Depth	406	421	434	453	406	406	453	453
Height	475	460	455	435	450	470	435	435
Tilt Angle	1	0	3	2	0	2	2	3
Front Radius	0	60	33	40	0	0	25	35
Rear Radius	0	80	60	0	0	0	50	45
Taper Width	0	5	5	15	10	0	6	15
Seat Front Rail	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
Seat Back Rail	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
Seat Side Rail	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE
Outer Frame Section	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE
Diameter	30	30	30	30	20	30	25	25
Width/Depth	10	10	20	30	30	40	25	30
Height	50	40	30	30	30	15	30	30
Seat Cross Rail	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	80	50	50
Number	1	1	1	1	1	4	1	1
Seat Long Rail	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
Width Front Spacing	0	50	50	50	50	50	0	0
Width Rear Spacing	0	50	50	50	50	50	0	0
Number	2	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
Number	4	4	4	4	4	4	4	4

Inner Frame Section	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE
Diameter	30	30	30	20	30	30	25	25
Width/Depth	20	30	30	40	30	70	25	30
Height	30	30	30	20	30	5	30	30
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Thickness	5	6	8	10	3	10	10	5
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	387	334	330	379	330	330	387	387
Height Spacing	0	200	0	0	200	160	0	0
Back-Seat Angle	95	95	95	96	94	95	96	96
Top Radius	0	30	0	20	0	0	30	0
Bottom Radius	0	50	0	0	0	0	0	0
Width	50	100	0	50	50	50	50	50
Taper Width	0	0	0	0	0	0	0	0
Back Upright	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE
Height	100	50	100	100	50	100	100	100
Back Top Rail	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Height	30	15	30	30	30	40	30	30
Depth	20	30	30	30	30	15	30	30
Back Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Height	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	2	1	1
Back Splat	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	50	50	50	50	50	50
Width Bottom Spacing	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Height	30	30	30	30	30	70	30	30
Depth	30	30	30	30	30	5	30	30
Back Panel	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE
Thickness	10	6	8	10	12	10	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	75	50	50	70
Tilt Angle	0	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0
Front Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0
Back Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE
Height	0	0	0	0	-15	20	0	0
Side Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Diameter	30	30	30	30	25	30	30	25
Width/Depth	30	30	30	30	30	15	30	30
Height	30	30	30	30	30	40	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	25	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	25	30	30	30
Width/Depth	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100	100
Depth	100	100	100	100	100	100	100	100
Front Radius	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	40	30	30
Height	30	30	30	30	30	15	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30
Base Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	254	223	223	223	223	235
Depth	100	100	20	100	100	100	100	50
Depth Rear Spacing	0	0	10	0	0	0	0	0
Tilt Angle	0	0	-27	0	0	0	0	-15
Front Radius	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	25	30	30	30	30	25
Width	30	30	30	30	30	30	30	30
Depth/Height	30	30	30	30	30	30	30	30
Arm Side Support	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
Depth Top Spacing	50	50	46	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	25	30	30	30	30	25
Width	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10

Table 5 Daciano-Jasper Common and Hybrid Designs

	DJC		DJH	
	DJC1	**DJC2**	**DJH1**	**DJH2**
Guides	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	TRUE	TRUE
Width Spacing	-6	0	0	1
Depth Spacing	-5	-18	0	-9
Splay Angle	0	0	0	0
Rake Angle	0	0	0	0
Section	FALSE	FALSE	TRUE	FALSE
Diameter	30	30	33	30
Width	25	22	30	20
Depth	25	30	30	100
Taper Ratio	100	100	80	100
Back Leg	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	-30	0	-75
Depth Spacing	0	0	0	0
Splay Angle	0	0	8	0
Rake Angle	10	15	22	10
Section	FALSE	FALSE	TRUE	FALSE
Diameter	30	30	25	30
Width	25	30	30	100
Depth	25	25	30	20
Taper Ratio	100	100	84	100
Leg Front Panel	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE
Width	480	470	406	470
Depth	450	453	406	406
Height	440	435	434	427
Tilt Angle	1	2	0	1
Front Radius	10	10	43	40
Rear Radius	50	80	89	80
Taper Width	0	0	13	15
Seat Front Rail	FALSE	TRUE	TRUE	TRUE
Seat Back Rail	FALSE	TRUE	TRUE	FALSE
Seat Side Rail	TRUE	TRUE	TRUE	FALSE
Outer Frame Section	FALSE	FALSE	FALSE	FALSE
Diameter	30	30	30	30
Width/Depth	25	22	27	100
Height	35	30	38	25
Seat Cross Rail	TRUE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50
Number	1	1	1	1
Seat Long Rail	FALSE	TRUE	FALSE	TRUE
Width Front Spacing	50	50	50	21
Width Rear Spacing	50	50	50	50
Number	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4

Inner Frame Section	FALSE	FALSE	TRUE	FALSE
Diameter	30	30	30	30
Width/Depth	40	20	30	100
Height	30	30	30	25
Seat Panel	TRUE	TRUE	TRUE	TRUE
Thickness	15	10	5	10
Back Guides	FALSE	FALSE	FALSE	FALSE
Height	385	375	406	350
Height Spacing	190	0	0	0
Back-Seat Angle	95	95	96	96
Top Radius	12	10	30	0
Bottom Radius	0	0	0	0
Width	50	50	50	50
Taper Width	0	0	0	0
Back Upright	TRUE	FALSE	TRUE	TRUE
Height	50	100	100	100
Back Top Rail	TRUE	FALSE	TRUE	FALSE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	FALSE	FALSE	TRUE	TRUE
Diameter	30	30	25	30
Width/Height	30	30	30	30
Depth	25	25	30	30
Back Cross Rail	FALSE	FALSE	FALSE	FALSE
Height	50	50	99	50
Number	1	1	1	1
Back Splat	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	50	50
Width Bottom Spacing	50	50	50	50
Number	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	17	30
Width/Height	30	30	30	30
Depth	30	30	30	30
Back Panel	TRUE	TRUE	FALSE	FALSE
Thickness	12	10	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE
Height	50	50	75	50
Tilt Angle	0	0	0	0
Front Radius	0	0	0	0
Rear Radius	0	0	0	0
Front Stretcher	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0
Back Stretcher	FALSE	FALSE	TRUE	FALSE
Height	0	0	0	0
Side Stretcher	FALSE	FALSE	TRUE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	25	30
Width/Depth	30	30	30	30
Height	30	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50
Width Rear Spacing	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30
Width/Depth	30	30	30	30
Height	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100
Depth	100	100	100	100
Front Radius	0	0	0	0
Rear Radius	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE
Diameter	30	30	30	30
Width/Depth	30	30	30	30
Height	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50
Width Rear Spacing	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	FALSE
Diameter	30	30	30	30
Width/Depth	30	30	30	30
Height	30	30	30	30
Base Panel	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	191
Depth	100	100	100	67
Depth Rear Spacing	0	0	0	0
Tilt Angle	0	0	0	0
Front Radius	0	0	0	0
Rear Radius	0	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE
Diameter	30	30	30	30
Width	30	30	30	60
Depth/Height	30	30	30	25
Arm Side Support	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50
Depth Bottom Spacing	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30
Width	30	30	30	30
Depth	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10

Table 6 Thonet Designs

	TC			**TE**	**TN**	
	TC1	**TC2**	**TC3**	**TE4**	**TN5**	**TN6**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	0	0	0	0	0
Depth Spacing	0	0	0	0	0	0
Splay Angle	0	0	0	0	0	0
Rake Angle	0	0	0	0	0	0
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	32.60	32.60	32.60	33	33	33
Width	30	30	30	30	30	30
Depth	30	30	30	30	30	30
Taper Ratio	60.43	60.43	60.43	60	60	60
Back Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	0	0	0	0	0
Depth Spacing	0	0	0	0	0	0
Splay Angle	7.94	7.94	7.94	8	8	8
Rake Angle	22.46	22.46	22.46	22	22	22
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	24.70	24.70	24.70	25	25	25
Width	30	30	30	30	30	30
Depth	30	30	30	30	30	30
Taper Ratio	83.64	83.64	83.64	84	84	84
Leg Front Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	406.00	406.00	406.00	406	406	406
Depth	406.00	406.00	406.00	406	406	406
Height	434.00	434.00	434.00	434	434	434
Tilt Angle	0	0	0	0	0	0
Front Radius	42.71	42.71	42.71	43	43	43
Rear Radius	88.78	88.78	88.78	89	89	89
Taper Width	13.05	13.05	13.05	13	13	13
Seat Front Rail	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Seat Back Rail	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Seat Side Rail	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Outer Frame Section	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Diameter	30	30	30	30	30	30
Width/Depth	26.60	26.60	26.60	27	27	27
Height	38.00	38.00	38.00	38	38	38
Seat Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50
Number	1	1	1	1	1	1
Seat Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50
Number	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30

Width/Depth	30	30	30	30	30	30
Height	30	30	30	30	30	30
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	5.00	5.00	5.00	5	5	5
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	406.10	406.10	406.10	406	406	406
Height Spacing	0	131.60	0	0	0	0
Back-Seat Angle	105.00	105.00	105.00	105	105	105
Top Radius	49.68	49.68	49.68	50	50	50
Bottom Radius	0	82.78	0	0	0	0
Width	50	50	50	50	50	50
Taper Width	-46.62	-46.62	-46.62	-47	-47	-47
Back Upright	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Height	100	100	100	100	100	100
Back Top Rail	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Back Bottom Rail	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	24.70	24.70	24.70	25	25	25
Width/Height	30	30	30	30	30	30
Depth	30	30	30	30	30	30
Back Cross Rail	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
Height	99.00	89.68	50	99	99	75
Number	1	1	1	1	1	1
Back Splat	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE
Width Top Spacing	50	50	31.80	50	50	50
Width Bottom Spacing	50	50	24.50	50	50	38
Number	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Diameter	16.80	16.80	16.80	17	17	17
Width/Height	30	30	30	40	30	30
Depth	30	30	30	10	30	30
Back Panel	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Thickness	10	5	10	10	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	76.57	76.57	76.57	77	77	77
Tilt Angle	0	0	0	0	0	0
Front Radius	48.45	48.45	48.45	48	48	48
Rear Radius	58.08	58.08	58.08	58	58	58
Front Stretcher	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Height	0	0	0	0	0	0
Back Stretcher	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Height	0	0	0	0	0	0
Side Stretcher	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	16.50	16.50	16.50	16	16	16
Width/Depth	30	30	30	30	30	30
Height	30	30	30	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50
Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Diameter	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30
Height	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100
Depth	100	100	100	100	100	100
Front Radius	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30
Height	30	30	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30
Height	30	30	30	30	30	30
Base Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	223	223	223
Depth	100	100	100	100	100	100
Depth Rear Spacing	0	0	0	0	0	0
Tilt Angle	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30
Width	30	30	30	30	30	30
Depth/Height	30	30	30	30	30	30
Arm Side Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30
Width	30	30	30	30	30	30
Depth	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10

Table 7 Iconic Designs (1/3)

	ICA												
	ICA1	**ICA2**	**ICA3**	**ICA4**	**ICA5**	**ICA6**	**ICA7**	**ICA8**	**ICA9**	**ICA10**	**ICA11**	**ICA12**	**ICA13**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Width Spacing	0	0	0	1	-25	-50	-50	-100	0	0	-13	-9	0
Depth Spacing	0	0	0	-12	-30	-50	-50	-100	0	-100	-13	-17	0
Splay Angle	0	0	0	0	20	25	25	0	0	0	0	0	0
Rake Angle	0	0	-100	20	15	20	20	0	0	70	0	0	-100
Section	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
Diameter	32.60	25	30	30	30	20	15	60	30	20	30	60	30
Width	30	30	30	35	15	30	30	30	18	30	60	44	30
Depth	30	30	30	15	45	30	30	30	25	30	60	76	30
Taper Ratio	60.43	100	100	100	100	100	100	60	60	100	50	100	78
Back Leg	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE
Width Spacing	0	0	0	1	-25	-55	-55	0	0	0	-13	-4	0
Depth Spacing	0	0	0	-18	-20	-35	-25	0	0	-100	-13	-34	0
Splay Angle	7.94	0	0	0	20	20	25	0	1	0	0	0	0
Rake Angle	22.46	0	0	20	15	20	25	0	5	90	10	0	0
Section	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
Diameter	24.70	30	30	30	30	20	15	30	30	20	30	60	30
Width	30	30	30	35	15	30	30	30	18	30	60	44	30
Depth	30	30	30	15	45	30	30	30	25	30	60	76	30
Taper Ratio	83.64	100	100	100	100	100	100	100	60	100	50	100	100
Leg Front Panel	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	25	10	10	10	10	10	10	10	10	10	8
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	406.00	470	406	474	470	490	483	508	406	480	525	413	500
Depth	406.00	470	406	461	488	438	454	470	406	408	450	436	481
Height	434.00	460	430	475	451	457	455	400	460	440	440	430	410
Tilt Angle	0	4	0	2	3	4	3	2	3	2	5	0	2
Front Radius	42.71	0	0	10	40	0	40	70	0	39	0	0	0
Rear Radius	88.78	0	0	0	30	0	1	30	0	0	0	30	30
Taper Width	13.05	0	15	0	10	5	5	5	12	0	15	0	0
Seat Front Rail	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
Seat Back Rail	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
Seat Side Rail	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
Outer Frame Section	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	25	30	30	30	20	15	30	25	18	30	30	30
Width/Depth	26.60	30	30	10	45	30	30	30	30	30	30	30	30
Height	38.00	30	30	22	15	30	30	30	30	30	30	30	30
Seat Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1	1	1	1	1	1	1
Seat Long Rail	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	0	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	0	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4	4	4	4	4	4

Inner Frame Section	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	20	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	120	30	30	30	30	30	30	30	30
Height	30	30	30	30	15	30	30	30	30	30	30	30	30
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	5.00	2	25	5	10	5	5	10	2	7	10	80	8
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	406.10	395	330	349	330	384	409	428	391	330	357	330	442
Height Spacing	0	180	0	0	105	0	0	0	180	0	0	0	0
Back-Seat Angle	105.00	100	99	105	97	97	99	97	92	103	98	100	97
Top Radius	49.68	0	0	20	45	80	75	35	0	20	15	30	90
Bottom Radius	0	0	0	0	45	0	0	0	0	0	0	0	0
Width	50	50	50	50	50	50	50	50	50	50	50	50	50
Taper Width	-46.62	0	0	0	8	0	20	30	-5	20	10	0	10
Back Upright	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Height	100	100	100	100	100	100	100	100	100	100	100	100	100
Back Top Rail	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	24.70	25	30	30	30	30	30	30	30	30	30	30	30
Width/Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Back Cross Rail	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Height	99.00	50	50	50	50	50	50	50	75	50	50	50	50
Number	1	1	1	1	1	1	1	1	2	1	1	1	1
Back Splat	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Bottom Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	16.80	30	30	30	30	30	30	30	30	30	30	30	30
Width/Height	30	30	30	30	120	30	30	30	40	30	30	30	30
Depth	30	30	30	30	15	30	30	30	5	30	30	30	30
Back Panel	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Thickness	10	2	25	5	10	5	5	10	10	7	10	10	8
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	76.57	50	50	50	50	50	15	50	60	50	50	50	50
Tilt Angle	0	0	0	0	0	0	85	0	0	0	0	0	0
Front Radius	48.45	0	0	0	0	0	0	0	0	0	0	0	0
Rear Radius	58.08	0	0	0	0	0	0	0	0	0	0	0	0
Front Stretcher	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0	25	0	0	0	0
Back Stretcher	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0	25	0	0	0	0
Side Stretcher	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	16.50	30	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	10	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	15	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100	74	100	100	100	100	100
Depth	100	100	90	100	100	100	100	70	100	100	100	100	100
Front Radius	0	0	0	0	0	0	0	100	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	100	0	0	0	0	98
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	25	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Base Panel	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	25	10	10	10	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	191	223	220	223	223	223	223	223	223	223
Depth	100	100	100	77	100	100	100	100	100	100	100	100	100
Depth Rear Spacing	0	0	0	62	0	0	0	0	0	0	0	0	0
Tilt Angle	0	0	0	0	0	-20	0	0	0	0	0	0	0
Front Radius	0	0	0	30	0	35	0	0	0	0	0	0	0
Rear Radius	0	0	0	30	0	0	0	0	0	0	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30	30
Width	30	30	30	35	30	30	30	30	30	30	30	30	30
Depth/Height	30	30	30	15	30	30	30	30	30	30	30	30	30
Arm Side Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	5	10	10	10	10	10	10	10

Table 8 Iconic Designs (2/3)

	ICB												
	ICB14	**ICB15**	**ICB16**	**ICB17**	**ICB18**	**ICB19**	**ICB20**	**ICB21**	**ICB22**	**ICB23**	**ICB24**	**ICB25**	**IPCB26**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Width Spacing	0	1	0	-100	-95	-100	0	0	0	0	0	0	0
Depth Spacing	0	-25	0	0	-95	-100	0	0	0	-15	0	0	0
Splay Angle	0	5	-30	0	65	0	0	-59	0	0	0	10	0
Rake Angle	3	20	-25	6	65	0	0	-63	0	0	0	15	5
Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Diameter	40	15	30	15	30	30	18	20	30	30	30	30	25
Width	30	30	30	30	30	25	30	30	20	12	30	30	30
Depth	30	30	30	30	30	9	30	30	30	70	30	11	30
Taper Ratio	65	100	100	100	60	100	100	100	90	100	100	100	100
Back Leg	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	1	-40	40	-95	-100	0	0	0	0	20	0	0
Depth Spacing	0	-25	-30	-20	-95	-100	0	0	0	0	0	0	-75
Splay Angle	0	5	27	15	65	0	0	-27	0	0	0	10	0
Rake Angle	15	20	35	12	65	0	0	-44	15	0	17	15	90
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Diameter	40	15	15	15	30	30	18	30	30	30	20	30	25
Width	30	30	30	30	30	30	30	30	20	12	30	30	30
Depth	30	30	30	30	30	30	30	30	30	70	30	11	30
Taper Ratio	65	100	100	100	60	100	100	100	100	100	100	100	100
Leg Front Panel	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	5	10	10	10	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	515	438	406	421	540	560	407	461	406	406	450	433	490
Depth	406	406	414	406	489	450	446	415	406	406	479	406	406
Height	450	450	420	440	457	430	460	470	475	410	470	450	420
Tilt Angle	3	5	4	1	5	4	0	5	1	0	3	5	2
Front Radius	0	25	0	100	70	40	0	0	0	0	0	0	0
Rear Radius	0	30	0	0	70	0	0	0	0	0	0	0	100
Taper Width	10	10	10	45	0	35	0	74	0	0	0	20	0
Seat Front Rail	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE
Seat Back Rail	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Seat Side Rail	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Diameter	25	15	15	15	30	30	18	20	30	30	30	30	25
Width/Depth	30	30	30	30	30	30	30	30	10	12	30	24	30
Height	30	30	30	30	30	30	30	30	50	70	30	4	30
Seat Cross Rail	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE
Depth Spacing	50	90	1	50	50	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1	1	1	1	1	1	1
Seat Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	0	50	50	0	50
Width Rear Spacing	50	50	50	50	50	50	50	50	0	50	50	0	50
Number	2	2	2	2	2	2	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Number	4	4	4	4	4	3	4	4	4	4	4	4	4

Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE
Diameter	30	30	15	15	30	30	30	15	30	30	30	30	30
Width/Depth	30	30	30	30	30	25	30	30	20	30	30	24	30
Height	30	30	30	30	30	9	30	30	30	30	30	4	30
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
Thickness	3	6	10	10	5	15	4	5	5	12	40	10	2
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	518	384	432	349	401	363	381	594	387	398	343	409	330
Height Spacing	0	0	0	0	130	0	190	0	0	160	0	0	0
Back-Seat Angle	98	98	95	95	95	98	97	100	95	97	101	101	103
Top Radius	0	20	15	75	100	30	0	0	0	0	0	0	0
Bottom Radius	0	0	0	0	85	0	0	0	0	0	0	0	0
Width	50	50	50	50	50	50	50	50	50	50	50	50	50
Taper Width	0	-35	20	-100	0	10	0	-100	0	0	0	10	-30
Back Upright	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Height	100	100	100	100	100	100	100	100	100	100	70	100	100
Back Top Rail	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Diameter	30	15	30	30	30	30	20	20	30	30	20	30	30
Width/Height	30	30	30	30	30	30	30	30	30	10	30	24	30
Depth	30	30	30	30	30	30	30	30	20	60	30	4	30
Back Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Height	50	50	50	50	50	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1	1	1	1	1	1	1
Back Splat	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	18	50	50	50	50	50	50	50	50	50	50	30	50
Width Bottom Spacing	0	80	50	50	50	50	50	50	50	50	50	0	50
Number	2	4	2	2	2	2	2	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Inner Frame Section	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
Diameter	30	8	30	30	30	30	30	15	30	30	30	30	30
Width/Height	30	30	30	30	30	30	30	30	30	30	30	24	30
Depth	10	30	30	30	30	30	30	30	30	30	30	4	30
Back Panel	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE
Thickness	10	10	10	10	5	15	4	5	10	12	40	10	2
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	65	85	40	50	50	50	5	50	50	50	50	50	50
Tilt Angle	0	0	-100	0	0	0	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0	0	0	0	0	0
Front Stretcher	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	25	0	0	0	0	0	0	0	0	0	0	0	0
Back Stretcher	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	-25	0	0	0	0	0	0	0	0	0	0	0	0
Side Stretcher	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	15	15	30	30	30	10	30	30	30	30	30	30
Width/Depth	20	30	30	30	30	30	30	30	30	30	30	30	30
Height	40	30	30	30	30	30	30	30	30	30	30	30	30
Cross Stretcher	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	1	50	50	50	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	15	30	30	30	10	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100	70	100	100	100	100	100
Depth	100	100	100	100	100	100	100	59	100	100	100	100	100
Front Radius	0	0	0	0	0	0	0	100	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	100	0	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	25	30	30	20	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	18	30	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	3	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	25	30	25	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	28	30	30	30	30	30
Height	30	30	30	30	30	9	30	10	30	30	30	30	30
Base Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	240	191	223	223	220	223	223	223	223	223	223	191	241
Depth	10	0	100	100	60	100	100	100	100	100	100	100	53
Depth Rear Spacing	0	0	0	0	80	0	0	0	0	0	0	0	23
Tilt Angle	-25	20	0	0	-20	0	0	0	0	0	0	-53	-25
Front Radius	0	40	0	0	0	0	0	0	0	0	0	0	41
Rear Radius	0	0	0	0	0	0	0	0	0	0	0	0	0
Arm Front Support	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	15	30	30	30	30	30	30	30	30	30	30	25
Width	30	30	30	30	50	30	30	30	30	30	30	30	30
Depth/Height	30	30	30	30	8	30	30	30	30	30	30	30	30
Arm Side Support	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Depth Top Spacing	50	50	50	50	50	50	50	50	50	50	50	50	0
Depth Bottom Spacing	100	50	50	50	50	50	50	50	50	50	50	50	100
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	5	10	10	10	10	10	10	10	10

Table 9 Iconic Designs (3/3)

	IE						
	IE27	**IE28**	**IE29**	**IE30**	**IE31**	**IE32**	**ISE1**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	0	-25	-19	0	0	-100
Depth Spacing	0	0	0	-9	0	0	9
Splay Angle	8	0	5	-2	0	0	0
Rake Angle	8	-2	5	-2	-7	5	0
Section	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE
Diameter	15	30	30	65	25	25	30
Width	30	30	120	30	30	30	41
Depth	30	30	18	30	30	30	29
Taper Ratio	100	100	100	50	100	100	100
Back Leg	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	0	0	26	0	0	15
Depth Spacing	0	-20	0	0	0	0	15
Splay Angle	8	0	5	3	0	0	0
Rake Angle	14	-2	15	20	2	15	0
Section	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE
Diameter	15	30	30	30	25	25	30
Width	30	30	100	30	30	30	41
Depth	30	30	18	30	30	30	29
Taper Ratio	100	100	100	80	100	100	100
Leg Front Panel	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
Leg Back Panel	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	50	10	10	2	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	466	406	560	408	406	465	406
Depth	406	506	471	435	490	406	406
Height	450	430	473	467	460	470	440
Tilt Angle	4	5	3	5	4	3	0
Front Radius	0	0	0	0	0	0	100
Rear Radius	0	0	0	0	0	0	100
Taper Width	0	0	10	18	0	5	0
Seat Front Rail	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Seat Back Rail	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Seat Side Rail	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	15	30	30	30	25	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30
Seat Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1
Seat Long Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	100	50	50	50
Width Rear Spacing	50	50	50	77	50	50	50
Number	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Number	4	4	4	4	4	4	4

Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Diameter	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	41
Height	30	30	30	30	30	30	29
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	2	50	18	5	2	10	30
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	330	460	504	428	358	334	518
Height Spacing	175	0	100	0	0	0	0
Back-Seat Angle	102	92	94	100	98	100	90
Top Radius	30	0	40	5	0	5	0
Bottom Radius	0	0	0	0	0	0	0
Width	50	50	50	50	50	50	50
Taper Width	10	0	14	0	0	0	0
Back Upright	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE
Height	100	100	100	100	100	100	100
Back Top Rail	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Back Bottom Rail	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	15	30	30	30	25	30	30
Width/Height	30	30	60	30	30	30	30
Depth	30	30	18	30	30	30	30
Back Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1
Back Splat	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	0	50	50	50	50
Width Bottom Spacing	50	50	0	50	50	50	50
Number	2	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width/Height	30	30	130	30	30	30	30
Depth	30	30	18	30	30	30	30
Back Panel	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE
Thickness	2	50	10	5	2	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	1	50	50	50	50	50	50
Tilt Angle	0	100	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0
Front Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0
Back Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0
Side Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30
Stretchers Panel	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	50	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100
Depth	100	100	100	100	100	100	100
Front Radius	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	15	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30
Base Panel	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	50	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	223	223	223	223
Depth	100	100	100	100	100	100	100
Depth Rear Spacing	0	0	0	0	0	0	0
Tilt Angle	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30
Depth/Height	30	30	30	30	30	30	30
Arm Side Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10

Table 10 New Types (1/2)

	New types												
	L1F	**L1B**	**L2FB**	**L2S**	**L4X1**	**L4XII**	**L4X=**	**L4XC**	**L4●II**	**L4●=**	**L4●X**	**L4●U**	**L4●UR**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Spacing	-100	0	-100	2	0	0	0	-10	0	0	10	0	0
Depth Spacing	0	0	-50	-100	0	0	0	-10	0	0	10	0	0
Splay Angle	0	0	0	-1	-95	0	-100	-100	0	-45	0	0	-40
Rake Angle	0	0	60	0	10	-100	0	-100	0	0	0	0	-40
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	25	30	30	25	25	30	30	50	30	30	30	30	30
Width	30	30	30	30	30	40	40	30	20	30	30	30	30
Depth	30	30	30	30	30	15	30	30	200	30	30	30	30
Taper Ratio	100	100	100	100	100	100	100	70	100	100	100	100	100
Back Leg	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
Width Spacing	0	-100	-100	0	0	0	0	-10	0	0	10	0	0
Depth Spacing	0	0	0	0	0	0	0	-10	0	0	10	0	0
Splay Angle	0	0	0	0	-40	0	-100	-100	0	-45	0	0	-40
Rake Angle	0	0	0	0	25	-100	0	-100	0	0	0	-100	-40
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	30	25	30	30	25	30	30	50	30	10	30	30	30
Width	30	30	30	30	30	40	40	30	20	30	30	30	30
Depth	30	30	30	30	30	15	30	30	200	30	30	30	30
Taper Ratio	100	100	100	100	100	100	100	70	100	100	100	100	100
Leg Front Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	20	10	8	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	483	483	406	483	450	483	483	483	483	460	450	483	425
Depth	457	457	410	457	450	457	457	457	457	457	450	457	425
Height	424	424	400	424	424	424	424	424	424	424	424	424	424
Tilt Angle	0	0	0	0	0	0	0	1	0	0	0	2	0
Front Radius	50	0	25	0	100	0	0	50	0	0	100	75	100
Rear Radius	0	100	25	0	100	0	0	50	0	0	100	75	100
Taper Width	0	0	50	0	0	0	0	0	0	0	0	25	0
Seat Front Rail	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Seat Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Seat Side Rail	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	25	30	30	30	30	30	30	20	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	40	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Seat Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1	1	1	1	1	1	1
Seat Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4	4	4	4	4	4

Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	25	30	30	30	30	30	30	30	20
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	10	10	10	10	10	10	10	10	10	10	15	10	10
Back Guides	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Height	450	430	370	460	420	350	483	433	330	560	410	440	425
Height Spacing	0	200	166	0	0	100	200	0	0	0	0	0	0
Back-Seat Angle	90	90	90	99	98	90	90	101	90	90	99	99	90
Top Radius	50	0	100	0	100	0	0	50	0	0	0	75	100
Bottom Radius	0	0	100	0	0	0	0	0	0	0	0	0	100
Width	50	50	50	50	50	50	50	50	50	50	50	50	72
Taper Width	0	0	0	25	-40	0	0	0	0	90	0	-50	0
Back Upright	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Height	100	100	50	100	100	100	100	100	100	100	100	100	100
Back Top Rail	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	25	30	30	30	25	30	30	30	30	10	30	30	30
Width/Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	40	30	30	30	30	30	30
Back Cross Rail	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	75	50	50	50	50	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	6	1	1	1	1	1	1
Back Splat	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Bottom Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2	2	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	15	30	30	30	30	30	30	30	30	30	30	30	30
Width/Height	30	30	30	30	30	30	20	30	30	30	30	30	30
Depth	30	30	30	30	30	30	20	30	30	30	30	30	30
Back Panel	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	10	10	10	10	10	10	10	10	20	10	10	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	50	50	50	50	50	50	50	50	50
Tilt Angle	0	0	0	0	0	0	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0	0	0	0	0	0
Front Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0	0	0	0	0	0
Back Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0	0	0	0	0	0
Side Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100	100	100	100	100	50	100
Depth	100	100	100	100	100	100	100	100	100	100	100	100	100
Front Radius	50	0	0	0	0	0	0	0	0	0	0	80	100
Rear Radius	0	100	0	0	0	0	0	0	0	0	0	0	100
Base Front Rail	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Base Side Rail	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	25	20	30	25	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	40	30	30	30	30	30	80	30	30	30
Height	30	30	30	15	30	30	30	30	30	20	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	0	50	50	50	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	25	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30	30
Base Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	223	223	223	223	223	254	223	223	223	223
Depth	100	100	100	46	100	100	100	100	100	100	100	100	100
Depth Rear Spacing	0	0	0	0	0	0	0	0	0	0	0	0	0
Tilt Angle	0	0	0	0	0	0	0	0	-31	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0	0	10	0	0	0
Rear Radius	0	0	0	0	0	0	0	0	0	10	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	25	30	30	30	30	30	30	30	30	30
Width	30	30	30	40	30	30	30	30	30	30	30	30	30
Depth/Height	30	30	30	15	30	30	30	30	30	30	30	30	30
Arm Side Support	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	33	50	50	50	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	0	50	50	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	25	30	30	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	20	10	10	10	10

Table 11 New Types (2/2)

	New types						
	L4●O	**L4OS**	**L4IR**	**LSHR**	**LSUR**	**LBHR**	**S*5**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	-75	0	0	0	0	-100
Depth Spacing	0	0	0	0	0	0	-100
Splay Angle	0	60	0	0	0	0	0
Rake Angle	0	0	-50	0	0	0	0
Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	25	25	30	20	25	30
Width	30	30	40	30	30	40	30
Depth	30	30	10	30	30	10	30
Taper Ratio	100	100	100	100	100	100	100
Back Leg	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	-75	0	0	0	0	-100
Depth Spacing	0	0	0	0	0	0	-100
Splay Angle	0	68	0	0	0	0	0
Rake Angle	0	0	-50	0	0	0	0
Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	25	25	30	20	25	30
Width	30	30	40	30	30	40	30
Depth	30	30	10	30	30	10	30
Taper Ratio	100	100	100	100	100	100	100
Leg Front Panel	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	483	453	425	450	483	425	483
Depth	457	457	457	457	457	457	457
Height	425	424	424	424	424	424	424
Tilt Angle	0	0	0	0	0	0	0
Front Radius	0	0	0	0	76	0	25
Rear Radius	0	0	0	0	0	0	0
Taper Width	25	25	0	10	75	0	25
Seat Front Rail	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE
Seat Back Rail	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE
Seat Side Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	25	25	30	30	25	30
Width/Depth	30	30	10	30	30	10	30
Height	30	30	30	30	30	30	30
Seat Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1
Seat Long Rail	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	100	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Number	4	4	4	4	4	4	5

Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Diameter	30	25	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	40
Height	30	30	30	30	30	30	20
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	10	10	10	5	10	10	10
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	480	480	330	483	450	330	440
Height Spacing	0	196	0	0	200	0	0
Back-Seat Angle	100	90	95	90	90	90	95
Top Radius	0	0	0	0	0	0	25
Bottom Radius	0	0	0	0	0	0	0
Width	25	50	50	50	50	50	50
Taper Width	0	25	0	0	0	0	0
Back Upright	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
Height	100	100	100	100	100	100	100
Back Top Rail	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	25	30	30	30	30	30
Width/Height	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30
Back Cross Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Height	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1
Back Splat	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	98	50	50	50	50
Width Bottom Spacing	50	50	0	50	50	50	50
Number	2	2	9	2	2	2	2
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	30	10	30	30	30	30
Width/Height	30	30	30	30	30	30	30
Depth	30	30	30	20	30	30	30
Back Panel	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
Thickness	10	10	10	10	10	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	25	40	50	50
Tilt Angle	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	100	0	0
Front Stretcher	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0
Back Stretcher	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE
Height	0	0	0	0	0	0	0
Side Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	30	30	10	15	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	20	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	0	50	50	50
Width Rear Spacing	50	50	50	0	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	30	30	30	10	30	30	30
Width/Depth	30	30	30	30	30	30	30
Height	30	30	30	10	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	100	100	100	100	100	100	100
Depth	100	100	100	100	100	100	100
Front Radius	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0
Base Front Rail	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
Base Back Rail	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
Base Side Rail	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	25	25	30	30	25	30
Width/Depth	30	30	40	30	30	10	30
Height	30	30	10	30	30	40	30
Base Cross Rail	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Width Front Spacing	50	50	50	50	50	0	50
Width Rear Spacing	50	50	50	50	50	0	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Number	4	4	4	4	4	4	5
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Diameter	30	30	15	30	30	25	30
Width/Depth	30	30	40	30	30	10	40
Height	30	30	10	30	30	40	15
Base Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	223	223	223	223
Depth	100	100	100	100	100	100	70
Depth Rear Spacing	0	0	0	0	0	0	0
Tilt Angle	0	0	0	0	0	-50	0
Front Radius	0	0	0	0	0	0	100
Rear Radius	0	0	0	0	0	0	100
Arm Front Support	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Armrest	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	25	30	30	25	30
Width	30	30	40	30	30	40	30
Depth/Height	30	30	10	30	30	10	30
Arm Side Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30
Arm Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Thickness	10	10	10	10	10	10	10

Table 12 Design Collections

	ICA8				ICB15				C			
	ICA8	**ICA8A**	**ICA8B**	**ICA8C**	**ICB15**	**ICB15A**	**ICB15B**	**ICB15C**	**C1A**	**C1B**	**C1C**	**C1D**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	-100	-100	-100	-100	1	1	1	1	0	0	0	0
Depth Spacing	-100	-100	-100	-100	-25	-25	-25	-25	0	0	0	0
Splay Angle	0	0	0	0	5	5	5	5	0	0	0	0
Rake Angle	0	0	0	0	20	20	20	20	0	0	0	0
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	60	60	60	60	15	15	15	15	25	25	25	25
Width	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30
Taper Ratio	60	60	60	60	100	100	100	100	100	100	100	100
Back Leg	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	0	0	0	0	1	0	1	1	0	0	0	0
Depth Spacing	0	0	0	0	-25	0	-25	-25	0	0	0	0
Splay Angle	0	0	0	0	5	5	5	5	0	0	0	0
Rake Angle	0	0	0	0	20	20	20	20	0	0	0	0
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	15	15	15	15	25	25	25	25
Width	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30
Taper Ratio	100	100	100	100	100	100	100	100	100	100	100	100
Leg Front Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Back Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Side Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Leg Radial Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10
Seat Guides	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	508	508	406	508	438	438	438	560	420	420	406	508
Depth	470	470	406	508	406	406	406	406	420	420	406	508
Height	400	400	417	368	450	450	450	368	420	420	460	368
Tilt Angle	2	2	0	0	5	5	0	0	0	0	0	0
Front Radius	70	60	100	100	25	25	25	25	0	0	0	0
Rear Radius	30	20	100	100	30	30	30	30	0	0	0	0
Taper Width	5	5	0	0	10	10	0	0	0	0	0	0
Seat Front Rail	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Seat Back Rail	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE
Seat Side Rail	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	15	15	15	15	25	25	25	25
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30
Seat Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	90	90	90	90	61	61	61	61
Number	1	1	1	1	1	1	1	1	7	7	7	7
Seat Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Number	2	2	2	2	2	2	2	2	2	2	2	2
Seat Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4	4	4	4	4

Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	10	10	10	10
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	10	10	70	10	6	6	6	6	10	10	10	10
Back Guides	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	428	428	428	428	384	384	384	384	450	330	330	330
Height Spacing	0	0	0	0	0	0	0	0	0	0	0	0
Back-Seat Angle	97	97	90	90	98	98	90	90	90	90	90	90
Top Radius	35	35	35	35	20	20	20	20	0	0	0	0
Bottom Radius	0	0	0	0	0	0	20	20	0	0	0	0
Width	50	50	50	50	50	50	50	50	50	50	50	50
Taper Width	30	20	30	30	-35	-35	-35	-35	0	0	0	0
Back Upright	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Height	100	100	100	100	100	100	100	100	100	100	100	100
Back Top Rail	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE
Back Bottom Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	15	15	15	15	25	25	25	25
Width/Height	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30
Back Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	50	50	50	50	50	50	50	50
Number	1	1	1	1	1	1	1	1	10	10	10	10
Back Splat	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Top Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Width Bottom Spacing	50	50	50	50	80	60	80	80	50	50	50	50
Number	2	2	2	2	4	4	4	4	8	8	8	8
Back Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	8	8	8	8	10	10	10	10
Width/Height	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30
Back Panel	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	50	50	50	50	85	85	85	85	50	50	50	50
Tilt Angle	0	0	0	0	0	0	0	0	0	0	0	0
Front Radius	0	0	0	0	0	0	0	0	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0	0	0	0	0
Front Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0	0	0	0	0
Back Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
Height	0	0	0	0	0	0	0	0	0	0	0	0
Side Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	15	15	15	15	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30
Cross Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Long Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50

Radial Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30
Stretchers Panel	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10
Base Guides	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	74	74	80	60	100	100	100	100	100	100	100	100
Depth	70	70	80	60	100	100	100	100	100	100	100	100
Front Radius	100	100	100	100	0	0	0	0	0	0	0	0
Rear Radius	100	100	100	100	0	0	0	0	0	0	0	0
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Back Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Base Side Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	25	25	25	25
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30
Base Cross Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Spacing	50	50	50	50	50	50	50	50	99	99	99	99
Base Long Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width Front Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Width Rear Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Base Radial Rail	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Number	4	4	4	4	4	4	4	4	4	4	4	4
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30
Width/Depth	30	30	30	30	30	30	30	30	30	30	30	30
Height	30	30	30	30	30	30	30	30	30	30	30	30
Base Panel	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	223	223	223	223	191	191	191	191	223	223	223	223
Depth	100	50	100	100	0	0	0	0	100	100	100	100
Depth Rear Spacing	0	0	0	0	0	0	0	0	0	0	0	0
Tilt Angle	0	0	0	0	20	20	20	20	0	0	0	0
Front Radius	0	40	0	0	40	40	40	40	0	0	0	0
Rear Radius	0	0	0	0	0	0	0	0	0	0	0	0
Arm Front Support	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Arm Back Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Armrest	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	15	15	15	15	25	30	30	30
Width	30	30	30	30	30	30	30	30	30	30	30	30
Depth/Height	30	30	30	30	30	30	30	30	30	30	30	30
Arm Side Support	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Depth Top Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Depth Bottom Spacing	50	50	50	50	50	50	50	50	50	50	50	50
Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Diameter	30	30	30	30	30	30	30	30	30	30	30	30
Width	30	30	30	30	30	30	30	30	30	30	30	30
Depth	30	30	30	30	30	30	30	30	30	30	30	30
Arm Panel	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Thickness	10	10	10	10	10	10	10	10	10	10	10	10

Table 13 Random Designs

	R														
	RS1I40	**RS2I5**	**RS2I16**	**RS31I2**	**RS3I38**	**RS4I31**	**RS6I27**	**RS7I34**	**RS7I40**	**RS8I21**	**RS8I22**	**RS8I36**	**RS9I9**	**RS10I4**	**RS4321I68**
Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Mode	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Legs Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Front Leg	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Width Spacing	16	-70	46	-10	46	-87	4	19	-43	-69	-19	-52	-93	-52	-98
Depth Spacing	54	66	8	-89	-63	-34	19	1	-55	-90	3	-93	-82	-29	-70
Splay Angle	30	-87	-68	-70	36	-18	93	-83	24	-53	-95	-50	15	-73	55
Rake Angle	22	-64	-1	-1	54	85	-26	38	-17	18	-65	76	-22	-74	-3
Section	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE
Diameter	38	97	70	189	258	17	211	232	222	54	14	8	188	159	252
Width	13	13	174	265	208	81	74	253	277	92	94	258	270	184	49
Depth	49	189	142	212	41	45	67	203	279	259	106	164	102	198	49
Taper Ratio	10	70	41	82	16	46	99	1	21	11	72	31	27	83	27
Back Leg	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Width Spacing	45	-95	-53	-95	86	-32	11	-49	0	-95	-22	-70	-37	36	-18
Depth Spacing	48	-54	-57	-69	-34	21	64	-49	-74	37	-10	-69	32	-37	8
Splay Angle	58	77	89	-54	-80	-35	-85	86	-31	-47	82	-26	-40	-3	-87
Rake Angle	81	-61	-7	1	-36	69	-5	-54	49	28	-87	44	85	10	-79
Section	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE
Diameter	114	123	274	99	255	150	203	200	229	79	64	23	25	60	41
Width	21	25	100	50	273	91	117	66	251	40	158	84	123	198	89
Depth	224	66	16	219	154	203	95	140	209	244	111	216	188	196	259
Taper Ratio	99	63	42	55	69	65	90	7	43	77	92	39	79	55	43
Leg Front Panel	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Leg Back Panel	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Leg Side Panel	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
Leg Radial Panel	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE
Thickness	74	11	54	73	56	45	31	54	83	20	84	12	92	6	12
Seat Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Width	553	464	441	478	412	407	407	472	513	528	500	427	522	532	458
Depth	458	408	424	423	477	430	467	502	443	417	443	477	454	440	448
Height	407	396	389	408	376	383	368	402	466	441	381	436	420	428	479
Tilt Angle	4	0	1	0	3	2	3	2	0	1	3	2	4	1	0
Front Radius	70	4	51	92	41	2	80	95	49	95	25	31	32	54	76
Rear Radius	90	92	14	27	44	85	42	42	91	30	73	42	11	88	10
Taper Width	43	30	41	7	51	46	72	38	79	43	97	89	11	2	52
Seat Front Rail	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE
Seat Back Rail	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Seat Side Rail	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Outer Frame Section	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
Diameter	43	84	257	73	98	9	19	241	105	183	53	16	151	67	44
Width/Depth	81	71	15	86	195	188	151	143	127	139	78	273	36	203	123
Height	107	210	178	92	275	212	104	208	1	218	7	148	210	244	46
Seat Cross Rail	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE
Depth Spacing	33	54	83	82	87	21	8	28	89	59	85	21	23	4	13
Number	2	9	3	9	5	2	7	5	2	10	4	8	3	5	6
Seat Long Rail	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Width Front Spacing	46	66	70	30	76	27	53	50	45	34	27	89	24	8	8
Width Rear Spacing	36	57	66	97	30	86	94	75	9	86	94	43	15	11	12
Number	6	10	7	11	6	10	3	9	2	8	5	11	3	3	4
Seat Radial Rail	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
Number	4	3	4	3	4	4	4	3	4	3	4	4	4	4	3

Inner Frame Section	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE
Diameter	188	37	237	107	10	11	274	21	229	78	101	79	255	134	50
Width/Depth	33	198	244	137	211	77	100	159	81	77	257	47	8	71	240
Height	168	189	37	52	37	54	2	12	164	67	214	15	153	155	153
Seat Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	82	79	34	13	1	89	98	91	73	75	55	33	27	77	7
Back Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	487	359	596	566	566	558	352	474	489	560	366	565	492	611	567
Height Spacing	95	171	58	36	35	106	32	189	21	109	19	70	54	124	65
Back-Seat Angle	91	103	98	98	101	104	95	90	95	95	94	104	95	94	104
Top Radius	24	97	86	7	20	51	22	73	30	22	10	68	42	19	87
Bottom Radius	79	73	85	63	45	35	94	17	15	61	91	64	15	36	45
Width	82	43	72	8	28	87	21	49	84	58	56	1	71	28	20
Taper Width	84	99	-73	75	-61	-85	-100	-85	-52	-43	90	-74	90	-23	-45
Back Upright	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Height	31	32	76	22	8	99	50	86	57	34	39	28	45	30	87
Back Top Rail	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
Back Bottom Rail	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Outer Frame Section	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE
Diameter	67	66	87	120	86	178	132	8	263	81	250	41	251	134	52
Width/Height	48	242	198	31	71	240	223	233	273	47	91	259	260	80	272
Depth	33	81	240	73	234	23	126	79	200	160	250	107	226	191	51
Back Cross Rail	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	73	26	36	94	36	76	71	29	85	58	56	78	21	93	62
Number	4	11	2	5	1	9	11	7	4	3	8	2	10	2	9
Back Splat	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
Width Top Spacing	59	47	52	54	86	8	75	28	66	69	37	32	44	81	2
Width Bottom Spacing	5	45	61	70	88	28	4	45	19	48	40	9	57	0	56
Number	6	6	9	7	7	9	7	6	4	10	2	5	3	8	11
Back Radial Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Inner Frame Section	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Diameter	144	110	162	150	209	39	182	170	62	90	26	219	91	77	123
Width/Height	30	212	156	176	50	233	9	262	58	3	232	141	83	191	46
Depth	209	74	30	7	58	48	88	104	13	269	270	118	212	25	54
Back Panel	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Thickness	47	99	86	94	69	53	55	31	11	22	66	78	29	62	50
Stretchers Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Height	80	40	9	95	61	17	56	84	53	15	57	59	9	45	96
Tilt Angle	50	-59	72	-24	-54	44	6	-12	76	-66	18	91	92	96	-52
Front Radius	75	21	80	84	43	94	88	7	17	79	71	46	90	18	33
Rear Radius	87	47	98	19	16	83	30	25	98	51	2	69	3	32	70
Front Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE
Height	-85	-100	90	59	29	-52	77	-43	12	-83	-15	48	19	-55	66
Back Stretcher	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
Height	-21	17	-88	-15	-81	-83	-22	-34	17	55	50	95	45	98	41
Side Stretcher	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
Outer Frame Section	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE
Diameter	86	67	133	37	87	178	238	58	95	250	123	257	62	163	80
Width/Depth	178	36	207	126	168	205	143	6	223	198	17	138	112	264	172
Height	94	116	221	164	240	21	31	184	57	14	182	145	198	2	135
Cross Stretcher	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
Depth Spacing	82	50	2	15	13	76	79	4	75	95	54	78	11	95	55
Long Stretcher	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE
Width Front Spacing	40	96	48	70	43	55	28	30	31	83	38	84	41	61	58
Width Rear Spacing	92	98	59	21	55	75	32	78	86	5	54	33	89	40	92

Radial Stretcher	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Inner Frame Section	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	
Diameter	42	2	194	147	257	203	83	205	99	77	43	72	152	134	206	
Width/Depth	172	125	36	74	276	202	256	139	139	130	246	74	96	112	229	
Height	5	54	254	248	236	182	39	259	145	197	30	60	254	244	226	
Stretchers Panel	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	
Thickness	19	22	63	35	31	63	10	34	41	83	46	77	42	15	41	
Base Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
Width	26	53	70	45	30	31	33	32	94	48	97	36	33	16	23	
Depth	5	71	24	54	72	33	90	90	20	51	30	54	43	17	43	
Front Radius	59	21	84	34	4	49	69	18	75	61	72	52	53	30	19	
Rear Radius	69	33	5	27	16	12	65	1	59	4	70	52	33	73	71	
Base Front Rail	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	
Base Back Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	
Base Side Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	
Outer Frame Section	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	
Diameter	227	210	162	18	94	277	267	129	90	20	135	261	91	107	146	
Width/Depth	151	162	255	151	95	30	70	45	22	170	82	126	120	140	36	
Height	230	226	237	268	145	238	115	104	225	11	153	274	24	184	57	
Base Cross Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	
Depth Spacing	6	7	53	89	36	72	75	31	55	59	77	20	86	14	41	
Base Long Rail	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	
Width Front Spacing	99	81	19	94	84	21	89	79	29	83	63	43	12	24	46	
Width Rear Spacing	51	5	27	9	63	73	5	85	69	32	67	35	19	6	95	
Base Radial Rail	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	
Number	4	3	4	3	3	3	4	4	3	4	4	4	3	4	3	
Inner Frame Section	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	
Diameter	234	100	98	109	55	103	265	127	25	47	189	26	156	216	76	
Width/Depth	178	266	209	217	188	78	176	272	180	144	21	87	184	112	228	
Height	102	23	166	144	143	193	236	279	120	18	250	158	237	11	238	
Base Panel	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	
Thickness	23	28	6	84	19	64	80	13	2	5	72	73	65	55	24	
Arms Guides	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
Height	233	203	235	240	222	224	252	202	226	196	209	196	192	216	198	
Depth	27	95	70	26	92	14	26	20	89	29	16	4	46	77	66	
Depth Rear Spacing	16	58	95	52	51	22	66	72	7	78	46	17	43	84	93	
Tilt Angle	-51	10	73	-55	35	94	-88	-6	-24	7	-96	-26	1	2	30	
Front Radius	58	38	63	56	84	40	27	58	60	39	82	56	0	23	82	
Rear Radius	34	90	62	91	98	56	63	85	1	96	25	66	7	47	11	
Arm Front Support	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	
Arm Back Support	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	
Armrest	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	
Outer Frame Section	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	
Diameter	140	5	85	148	49	96	14	59	237	256	271	66	8	68	234	
Width	111	123	166	120	118	217	129	237	91	211	37	40	129	13	173	
Depth/Height	105	215	249	273	31	47	187	149	193	122	271	29	111	72	114	
Arm Side Support	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	
Depth Top Spacing	79	10	11	33	31	71	81	78	75	34	3	88	76	68	75	
Depth Bottom Spacing	52	71	82	27	42	82	93	39	93	58	28	67	40	81	15	
Section	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	
Diameter	73	263	271	40	138	201	118	142	64	137	13	107	13	204	58	
Width	100	150	64	31	253	196	270	84	37	274	229	1	8	172	53	
Depth	270	43	83	100	117	156	209	119	101	156	193	177	175	168	235	
Arm Panel	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
Thickness	55	38	91	54	36	79	47	29	58	46	32	3	59	42	44	

Appendix 6.F Tests

Appendix 6.F.1 Descriptive Test

Table 14 Descriptive Test to ChairDNA (1/2)

Reproducible features	DC					JC					TC			ICA			
	DC1	DC2	DC3	DC4	DC5	JC1	JC2	JC3	JC4	JC5	TC1	TC2	TC3	ICA2	ICA3	ICA4	ICA5
Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mode	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Legs Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front Leg	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES
Width Spacing	YES	YES	YES	NO	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	YES
Depth Spacing	YES	YES	YES	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	YES
Splay Angle	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES
Rake Angle	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	YES
Section	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
Diameter	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	YES	YES	YES	YES	NO	NO	NO
Width	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
Depth	YES	YES	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
Taper Ratio	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Back Leg	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Width Spacing	YES	YES	YES	NO	YES	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	YES
Depth Spacing	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	YES
Splay Angle	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	YES	YES	NO	NO	NO	YES
Rake Angle	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Section	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
Diameter	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	YES	YES	YES	NO	NO	NO	NO
Width	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
Depth	YES	YES	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
Taper Ratio	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Leg Front Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO
Leg Back Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Leg Side Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Leg Radial Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO
Seat Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Depth	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Height	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Tilt Angle	YES	YES	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	YES	YES
Front Radius	YES	YES	YES	NO	YES	NO	YES	YES	YES	NO	YES	YES	YES	NO	NO	YES	YES
Rear Radius	NO	YES	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	NO	NO	YES
Taper Width	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES
Seat Front Rail	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES
Seat Back Rail	NO	NO	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES
Seat Side Rail	NO	NO	NO	YES	NO	YES	YES	NO	NO	YES	YES	YES	YES	YES	NO	NO	NO
Outer Frame Section	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	NO	NO	YES	YES
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO
Width/Depth	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	NO	NO	YES	YES
Height	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	YES	YES
Seat Cross Rail	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Seat Long Rail	YES	YES	YES	NO	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES
Width Front Spacing	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Width Rear Spacing	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Seat Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	YES	YES	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO

Width/Depth	YES	YES	YES	YES	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES
Height	YES	YES	NO	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES
Seat Panel	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Thickness	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	NO
Back Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Height Spacing	NO	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	YES	NO	YES	NO	NO	YES
Back-Seat Angle	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Top Radius	YES	NO	YES	NO	NO	NO	YES	NO	YES	NO	YES	YES	YES	NO	NO	YES	YES
Bottom Radius	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES
Width	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Taper Width	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES
Back Upright	NO	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	NO	NO	NO
Height	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Back Top Rail	YES	YES	NO	YES	NO	YES	NO	YES	NO	NO	YES	YES	YES	YES	NO	NO	NO
Back Bottom Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Outer Frame Section	NO	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO
Width/Height	NO	YES	NO	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth	NO	YES	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Cross Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Splat	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES
Width Top Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
Width Bottom Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO
Width/Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Back Panel	YES	NO	YES	YES	NO	NO	YES	YES	YES	YES	NO	YES	NO	YES	YES	YES	YES
Thickness	YES	NO	YES	YES	NO	NO	YES	YES	NO	YES	NO	YES	NO	YES	YES	YES	NO
Stretchers Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Tilt Angle	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Front Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO
Rear Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO
Front Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Side Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Outer Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Width/Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Cross Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Depth Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Long Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Front Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Rear Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Radial Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Width/Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Stretchers Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO

Front Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Rear Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Front Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Back Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
Base Side Rail	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
Outer Frame Section	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
Width/Depth	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Cross Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Long Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Front Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Rear Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width/Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO
Thickness	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO
Arms Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO
Depth	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO
Depth Rear Spacing	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO
Tilt Angle	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Front Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Rear Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Arm Front Support	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Arm Back Support	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Armrest	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO
Outer Frame Section	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Depth/Height	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Arm Side Support	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Top Spacing	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Bottom Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Section	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arm Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Irreproducible features	**DC**					**JC**					**TC**			**ICA**			
	DC1	**DC2**	**DC3**	**DC4**	**DC5**	**JC1**	**JC2**	**JC3**	**JC4**	**JC5**	**TC1**	**TC2**	**TC3**	**ICA2**	**ICA3**	**ICA4**	**ICA5**
Out of Range	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Overall Width	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO	NO
Overall Depth	NO	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO
Overall Height	NO	YES	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	YES
Seat Rear Radius	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Height Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Back-Seat Angle	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO
Back Width	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arms Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Arms Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Missing Parts/Parameters	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Legs 1D Taper	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Legs Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Legs Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Legs Orientation	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Seat Outer Frame Width/Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Seat Box-Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
Back Depth Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Back Curvature	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Back Upright Taper Ratio	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO
Back Panel Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO
Stretchers Number	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Stretchers Side Section Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arms Splay Angle	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arm Support Taper Ratio	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Radial Height	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Section Taper Width/Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Panels Alignment (centre)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Bugs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Back Upright	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Back Section Orientation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arms Position	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO

Completeness	**DC**					**JC**					**TC**			**ICA**			
	DC1	**DC2**	**DC3**	**DC4**	**DC5**	**JC1**	**JC2**	**JC3**	**JC4**	**JC5**	**TC1**	**TC2**	**TC3**	**ICA2**	**ICA3**	**ICA4**	**ICA5**
Reproducible Features (Fr)	41	41	47	39	34	32	39	41	28	30	39	44	40	21	16	42	46
Irreproducible Features (Fi)	0	2	2	2	3	4	1	2	1	3	4	7	4	2	3	2	4
Completeness	**1.00**	**0.95**	**0.96**	**0.95**	**0.92**	**0.89**	**0.98**	**0.95**	**0.97**	**0.91**	**0.91**	**0.86**	**0.91**	**0.91**	**0.84**	**0.95**	**0.92**

Table 15 Descriptive Test to ChairDNA (2/2)

								ICB											
ICA6	**ICA7**	**ICA8**	**ICA9**	**ICA10**	**ICA11**	**ICA12**	**ICA13**	**ICB14**	**ICB15**	**ICB16**	**ICB17**	**ICB18**	**ICB19**	**ICB20**	**ICB21**	**ICB23**	**ICB24**	**ICB25**	**IPCB26**
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	YES	YES
YES	YES	YES	NO	NO	YES	YES	NO	NO	YES	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO
YES	YES	YES	NO	YES	YES	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO
YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	YES	NO	NO	YES	NO	NO	YES	NO
YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	NO	NO	YES	YES
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO	YES	NO
YES	YES	YES	NO	YES	NO	YES	NO	YES	YES	NO	YES	NO	NO	YES	YES	NO	NO	NO	YES
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO	YES	NO
NO	NO	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	NO	YES	NO	YES	YES	YES	YES
YES	YES	NO	NO	NO	YES	YES	NO	NO	YES	YES	YES	YES	YES	NO	NO	NO	YES	NO	NO
YES	YES	NO	NO	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	YES
YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	YES	NO	NO	YES	NO
YES	YES	NO	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	NO	NO	YES	NO	YES	YES	YES
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
YES	YES	NO	NO	YES	NO	YES	NO	YES	YES	YES	YES	NO	NO	YES	NO	NO	YES	NO	YES
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES	YES	YES
NO	YES	YES	NO	YES	NO	NO	NO	NO	YES	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO
NO	YES	YES	NO	NO	NO	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES
YES	YES	YES	YES	NO	YES	NO	NO	YES	YES	YES	YES	NO	YES	NO	YES	NO	NO	YES	NO
NO	YES	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO
NO	YES	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	NO	YES	YES
YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	YES	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	NO
YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES
YES	YES	NO	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	NO	YES
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	YES	NO	NO	NO
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	YES	YES	YES	YES	YES	NO	YES	NO	YES	YES	YES	NO	YES	NO	YES	NO	NO	YES	YES
NO	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	YES	YES	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	NO	YES	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES
YES	YES	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	NO	YES
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NO	YES	NO	YES	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO
NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
YES	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	YES	YES
NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES
YES	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	YES	YES
YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO

								ICB											
ICA6	**ICA7**	**ICA8**	**ICA9**	**ICA10**	**ICA11**	**ICA12**	**ICA13**	**ICB14**	**ICB15**	**ICB16**	**ICB17**	**ICB18**	**ICB19**	**ICB20**	**ICB21**	**ICB23**	**ICB24**	**ICB25**	**IPCB26**
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	YES	NO	YES	NO	NO	NO
YES	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO	YES	NO
NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO
NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

								ICB												Mean	SD
ICA6	**ICA7**	**ICA8**	**ICA9**	**ICA10**	**ICA11**	**ICA12**	**ICA13**	**ICB14**	**ICB15**	**ICB16**	**ICB17**	**ICB18**	**ICB19**	**ICB20**	**ICB21**	**ICB23**	**ICB24**	**ICB25**	**IPCB26**		
33	34	23	43	25	26	24	18	42	48	32	25	37	32	27	46	29	20	46	33	34	9
3	1	0	6	1	1	2	1	3	2	2	0	3	4	1	1	3	1	3	2	2	2
0.92	**0.97**	**1.00**	**0.88**	**0.96**	**0.96**	**0.92**	**0.95**	**0.93**	**0.96**	**0.94**	**1.00**	**0.93**	**0.89**	**0.96**	**0.98**	**0.91**	**0.95**	**0.94**	**0.94**	**0.94**	**0.04**

Appendix 6.F.2 Anaytic Test

Table 16 Analytic Test to ChairDNA

Reproducible features	DE	JE	TE	IE					
	DE6	JE6	TE4	IE27	IE28	IE29	IE30	IE31	IE32
Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mode	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Legs Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front Leg	YES	YES	YES	YES	NO	YES	YES	YES	YES
Width Spacing	YES	NO	NO	NO	NO	YES	YES	NO	NO
Depth Spacing	NO	NO	NO	NO	NO	NO	YES	NO	NO
Splay Angle	NO	NO	NO	YES	NO	YES	YES	NO	NO
Rake Angle	NO	NO	NO	YES	YES	YES	NO	YES	YES
Section	YES	YES	NO	NO	NO	YES	NO	NO	NO
Diameter	NO	NO	YES	YES	NO	NO	YES	YES	YES
Width	YES	YES	NO	NO	NO	YES	NO	NO	NO
Depth	YES	YES	NO	NO	NO	YES	NO	NO	NO
Taper Ratio	NO	NO	YES	NO	NO	NO	YES	NO	NO
Back Leg	YES	YES	YES	YES	NO	YES	YES	YES	YES
Width Spacing	YES	NO	NO	NO	NO	NO	YES	NO	NO
Depth Spacing	YES	NO	NO	NO	YES	NO	NO	NO	NO
Splay Angle	NO	NO	YES	YES	NO	YES	YES	NO	NO
Rake Angle	NO	YES	YES	YES	NO	YES	YES	NO	YES
Section	YES	YES	NO	NO	NO	YES	NO	NO	NO
Diameter	NO	NO	YES	YES	NO	NO	NO	YES	YES
Width	YES	YES	NO	NO	NO	YES	NO	NO	NO
Depth	YES	YES	NO	NO	NO	YES	NO	NO	NO
Taper Ratio	NO	NO	YES	NO	NO	NO	YES	NO	NO
Leg Front Panel	NO	NO	NO	NO	YES	NO	NO	YES	NO
Leg Back Panel	NO	NO	NO	NO	YES	NO	NO	NO	NO
Leg Side Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO
Leg Radial Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	YES	NO	NO	YES	NO
Seat Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width	YES	YES	YES	YES	YES	YES	YES	YES	YES
Depth	YES	YES	YES	YES	YES	YES	YES	YES	YES
Height	YES	YES	YES	YES	YES	YES	YES	YES	YES
Tilt Angle	YES	YES	NO	YES	YES	YES	YES	YES	YES
Front Radius	YES	NO	YES	NO	NO	NO	NO	NO	NO
Rear Radius	YES	NO	YES	NO	NO	NO	NO	NO	NO
Taper Width	NO	NO	YES	NO	NO	YES	YES	NO	YES
Seat Front Rail	NO	NO	YES	YES	NO	NO	NO	NO	NO
Seat Back Rail	NO	NO	YES	YES	NO	NO	YES	NO	NO
Seat Side Rail	YES	YES	YES	NO	NO	NO	NO	YES	NO
Outer Frame Section	YES	YES	YES	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	YES	NO	NO	NO	YES	NO
Width/Depth	YES	YES	YES	NO	NO	NO	NO	NO	NO
Height	YES	YES	YES	NO	NO	NO	NO	NO	NO
Seat Cross Rail	YES	YES	NO	NO	NO	NO	NO	NO	NO
Depth Spacing	YES	YES	NO	NO	NO	NO	NO	NO	NO
Number	YES	YES	NO	NO	NO	NO	NO	NO	NO
Seat Long Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Front Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Rear Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO
Seat Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	YES	YES	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width/Depth	YES	YES	NO	NO	NO	NO	NO	NO	NO
Height	YES	YES	NO	NO	NO	NO	NO	NO	NO
Seat Panel	YES	NO	YES	YES	YES	YES	YES	YES	YES

Thickness	NO	NO	YES	YES	YES	YES	YES	YES	NO
Back Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	YES	YES	YES	YES	YES	YES	YES	YES	YES
Height Spacing	NO	YES	NO	YES	NO	YES	NO	NO	NO
Back-Seat Angle	NO	YES	YES	YES	YES	YES	YES	YES	YES
Top Radius	NO	NO	YES	YES	NO	YES	YES	NO	YES
Bottom Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width	NO	NO	NO	NO	NO	NO	NO	NO	NO
Taper Width	NO	NO	YES	YES	NO	YES	NO	NO	NO
Back Upright	YES	YES	YES	YES	NO	YES	NO	YES	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Top Rail	YES	NO	YES	YES	NO	YES	NO	NO	NO
Back Bottom Rail	NO	NO	NO	NO	NO	YES	NO	NO	NO
Outer Frame Section	YES	YES	NO	NO	NO	YES	NO	NO	NO
Diameter	NO	NO	YES	YES	NO	NO	NO	YES	NO
Width/Height	YES	YES	NO	NO	NO	YES	NO	NO	NO
Depth	YES	YES	NO	NO	NO	YES	NO	NO	NO
Back Cross Rail	NO	YES	YES	NO	NO	NO	NO	NO	NO
Height	NO	NO	YES	NO	NO	NO	NO	NO	NO
Number	NO	YES	NO	NO	NO	NO	NO	NO	NO
Back Splat	NO	NO	NO	NO	NO	YES	NO	NO	NO
Width Top Spacing	NO	NO	NO	NO	NO	YES	NO	NO	NO
Width Bottom Spacing	NO	NO	NO	NO	NO	YES	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	NO	YES	YES	NO	NO	YES	NO	NO	NO
Diameter	NO	NO	YES	NO	NO	NO	NO	NO	NO
Width/Height	NO	YES	YES	NO	NO	YES	NO	NO	NO
Depth	NO	YES	YES	NO	NO	YES	NO	NO	NO
Back Panel	NO	NO	NO	YES	YES	NO	YES	YES	YES
Thickness	NO	NO	NO	YES	YES	NO	YES	YES	NO
Stretchers Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	YES	NO	YES	NO	NO	NO	NO	NO	NO
Tilt Angle	NO	NO	NO	NO	YES	NO	NO	NO	NO
Front Radius	NO	NO	YES	NO	NO	NO	NO	NO	NO
Rear Radius	NO	NO	YES	NO	NO	NO	NO	NO	NO
Front Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO
Back Stretcher	NO	YES	NO	NO	NO	NO	NO	NO	NO
Height	NO	YES	NO	NO	NO	NO	NO	NO	NO
Side Stretcher	YES	NO	NO	NO	NO	NO	NO	NO	NO
Outer Frame Section	YES	YES	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	YES	NO	NO	NO	NO	NO	NO
Width/Depth	YES	YES	NO	NO	NO	NO	NO	NO	NO
Height	YES	YES	NO	NO	NO	NO	NO	NO	NO
Cross Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Long Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Front Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Rear Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Radial Stretcher	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width/Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO
Stretchers Panel	NO	NO	NO	NO	YES	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	YES	NO	NO	NO	NO
Base Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO
Front Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO
Rear Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Front Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO

Base Back Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Side Rail	NO	YES	NO	YES	NO	NO	NO	NO	NO
Outer Frame Section	NO	YES	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	YES	NO	NO	NO	NO	NO
Width/Depth	NO	YES	NO	NO	NO	NO	NO	NO	NO
Height	NO	YES	NO	NO	NO	NO	NO	NO	NO
Base Cross Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Long Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Front Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width Rear Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Radial Rail	NO	NO	NO	NO	NO	NO	NO	NO	NO
Number	NO	NO	NO	NO	NO	NO	NO	NO	NO
Inner Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width/Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO
Base Panel	NO	NO	NO	NO	YES	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	YES	NO	NO	NO	NO
Arms Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Rear Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Tilt Angle	NO	NO	NO	NO	NO	NO	NO	NO	NO
Front Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO
Rear Radius	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arm Front Support	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arm Back Support	NO	NO	NO	NO	NO	NO	NO	NO	NO
Armrest	NO	NO	NO	NO	NO	NO	NO	NO	NO
Outer Frame Section	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth/Height	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arm Side Support	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Top Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth Bottom Spacing	NO	NO	NO	NO	NO	NO	NO	NO	NO
Section	NO	NO	NO	NO	NO	NO	NO	NO	NO
Diameter	NO	NO	NO	NO	NO	NO	NO	NO	NO
Width	NO	NO	NO	NO	NO	NO	NO	NO	NO
Depth	NO	NO	NO	NO	NO	NO	NO	NO	NO
Arm Panel	NO	NO	NO	NO	NO	NO	NO	NO	NO
Thickness	NO	NO	NO	NO	NO	NO	NO	NO	NO

Irreproducible features	**DE**	**JE**	**TE**	**IE**					
	DE6	**JE6**	**TE4**	**IE27**	**IE28**	**IE29**	**IE30**	**IE31**	**IE32**
Out of Range	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Overall Width	NO	NO	YES	NO	YES	YES	NO	NO	NO
Overall Depth	YES	YES	YES	YES	NO	NO	NO	NO	YES
Overall Height	YES	YES	NO	NO	NO	NO	NO	NO	NO
Back-Seat Angle	NO	NO	YES	YES	NO	NO	NO	NO	NO
Missing parameters	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leg Front Panel Height	NO	NO	NO	NO	YES	NO	NO	YES	NO
Leg Front Panel Height Spac-ing	NO	NO	NO	NO	YES	NO	NO	NO	NO
Leg Front Panel Number	NO	NO	NO	NO	YES	NO	NO	NO	NO
Leg Back Panel Height	NO	NO	NO	NO	YES	NO	NO	NO	NO
Leg Back Panel Height Spacing	NO	NO	NO	NO	YES	NO	NO	NO	NO
Leg Side Panel Height	NO	NO	NO	YES	NO	NO	NO	NO	NO
Back Depth Spacing	NO	NO	NO	YES	NO	NO	NO	NO	NO
Back Upright Taper Ratio	NO	NO	YES	NO	NO	NO	NO	NO	NO
Back Upright Number	NO	NO	NO	NO	NO	NO	NO	YES	NO
Stretchers Panel Number	NO	NO	NO	NO	YES	NO	NO	NO	NO

Section Taper Width/Radius	YES	NO	NO	NO	NO	NO	NO	NO	NO
Panels Alignment (centre)	NO	NO	NO	NO	NO	NO	NO	YES	NO
Bugs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Back Section Orientation	NO	YES	YES	NO	NO	YES	NO	NO	NO
Strectchers Section Orientation	NO	YES	NO	NO	NO	NO	NO	NO	NO
Outer Frame Joints	YES	NO	NO	NO	NO	NO	NO	NO	NO

Completeness	**DE**	**JE**	**TE**	**IE**						**Mean**	**SD**
	DE6	**JE6**	**TE4**	**IE27**	**IE28**	**IE29**	**IE30**	**IE31**	**IE32**		
Reproducible Features (Fr)	39	44	39	29	20	37	24	21	16	30	10
Irreproducible Features (Fi)	4	4	5	4	7	2	0	3	1	3	2
Completeness	**0.91**	**0.92**	**0.89**	**0.88**	**0.74**	**0.95**	**1.00**	**0.88**	**0.94**	**0.90**	**0.07**

Table 17 Analytic Test to ChairDNA within the restrictios of DCG, JCG and TCG

Reproducible features	DE	JE	TE
	DE6	JE6	TE4
Guides	N/A	N/A	N/A
Mode	N/A	N/A	N/A
Legs Guides	N/A	N/A	N/A
Front Leg	YES	YES	YES
Width Spacing	YES	NO	NO
Depth Spacing	NO	NO	NO
Splay Angle	NO	NO	NO
Rake Angle	NO	NO	NO
Section	YES	YES	NO
Diameter	NO	NO	YES
Width	YES	NO	NO
Depth	NO	NO	NO
Taper Ratio	NO	NO	YES
Back Leg	YES	YES	YES
Width Spacing	YES	NO	NO
Depth Spacing	NO	NO	NO
Splay Angle	NO	NO	YES
Rake Angle	NO	NO	YES
Section	YES	YES	NO
Diameter	NO	NO	YES
Width	YES	NO	NO
Depth	YES	NO	NO
Taper Ratio	NO	NO	YES
Leg Front Panel	NO	NO	NO
Leg Back Panel	NO	NO	NO
Leg Side Panel	NO	NO	NO
Leg Radial Panel	NO	NO	NO
Thickness	NO	NO	NO
Seat Guides	N/A	N/A	N/A
Width	NO	YES	YES
Depth	NO	YES	YES
Height	YES	YES	YES
Tilt Angle	YES	YES	NO
Front Radius	YES	NO	YES
Rear Radius	YES	NO	YES
Taper Width	NO	NO	YES
Seat Front Rail	NO	NO	YES
Seat Back Rail	NO	NO	YES
Seat Side Rail	YES	YES	YES
Outer Frame Section	YES	YES	YES
Diameter	NO	NO	NO
Width/Depth	YES	NO	YES
Height	NO	NO	YES
Seat Cross Rail	YES	YES	NO
Depth Spacing	NO	NO	NO
Number	NO	NO	NO
Seat Long Rail	NO	NO	NO
Width Front Spacing	NO	NO	NO
Width Rear Spacing	NO	NO	NO
Number	NO	NO	NO
Seat Radial Rail	NO	NO	NO
Number	NO	NO	NO
Inner Frame Section	YES	YES	NO
Diameter	NO	NO	NO
Width/Depth	YES	NO	NO
Height	NO	NO	NO
Seat Panel	YES	NO	YES
Thickness	NO	NO	YES
Back Guides	N/A	N/A	N/A

Irreproducible features	DE	JE	TE
	DE6	JE6	TE4
Guides	N/A	N/A	N/A
Mode	N/A	N/A	N/A
Legs Guides	N/A	N/A	N/A
Front Leg	NO	NO	NO
Width Spacing	NO	NO	NO
Depth Spacing	YES	NO	NO
Splay Angle	NO	NO	NO
Rake Angle	NO	NO	NO
Section	NO	NO	NO
Diameter	NO	NO	NO
Width	NO	YES	NO
Depth	YES	YES	NO
Taper Ratio	NO	NO	NO
Back Leg	NO	NO	NO
Width Spacing	NO	NO	NO
Depth Spacing	YES	NO	NO
Splay Angle	NO	NO	NO
Rake Angle	NO	YES	NO
Section	NO	NO	NO
Diameter	NO	NO	NO
Width	NO	YES	NO
Depth	NO	YES	NO
Taper Ratio	NO	NO	NO
Leg Front Panel	NO	NO	NO
Leg Back Panel	NO	NO	NO
Leg Side Panel	NO	NO	NO
Leg Radial Panel	NO	NO	NO
Thickness	NO	NO	NO
Seat Guides	N/A	N/A	N/A
Width	YES	NO	NO
Depth	YES	NO	NO
Height	NO	NO	NO
Tilt Angle	NO	NO	NO
Front Radius	NO	NO	NO
Rear Radius	NO	NO	NO
Taper Width	NO	NO	NO
Seat Front Rail	YES	NO	NO
Seat Back Rail	NO	NO	NO
Seat Side Rail	NO	NO	NO
Outer Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	YES	NO
Height	YES	YES	NO
Seat Cross Rail	NO	NO	NO
Depth Spacing	YES	YES	NO
Number	YES	YES	NO
Seat Long Rail	NO	NO	NO
Width Front Spacing	NO	NO	NO
Width Rear Spacing	NO	NO	NO
Number	NO	NO	NO
Seat Radial Rail	NO	NO	NO
Number	NO	NO	NO
Inner Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	YES	NO
Height	YES	YES	NO
Seat Panel	NO	YES	NO
Thickness	YES	NO	NO
Back Guides	N/A	N/A	N/A

Height	YES	YES	YES
Height Spacing	NO	YES	NO
Back-Seat Angle	NO	YES	YES
Top Radius	NO	NO	YES
Bottom Radius	NO	NO	NO
Width	NO	NO	NO
Taper Width	NO	NO	YES
Back Upright	YES	YES	YES
Height	NO	NO	NO
Back Top Rail	YES	NO	YES
Back Bottom Rail	NO	NO	NO
Outer Frame Section	YES	YES	NO
Diameter	NO	NO	YES
Width/Height	YES	NO	NO
Depth	YES	NO	NO
Back Cross Rail	NO	NO	YES
Height	NO	NO	YES
Number	NO	NO	NO
Back Splat	NO	NO	NO
Width Top Spacing	NO	NO	NO
Width Bottom Spacing	NO	NO	NO
Number	NO	NO	NO
Back Radial Rail	NO	NO	NO
Inner Frame Section	NO	NO	NO
Diameter	NO	NO	YES
Width/Height	NO	NO	NO
Depth	NO	NO	NO
Back Panel	NO	NO	NO
Thickness	NO	NO	NO
Stretchers Guides	N/A	N/A	N/A
Height	NO	NO	YES
Tilt Angle	NO	NO	NO
Front Radius	NO	NO	YES
Rear Radius	NO	NO	YES
Front Stretcher	NO	NO	NO
Height	NO	NO	NO
Back Stretcher	NO	YES	NO
Height	NO	NO	NO
Side Stretcher	NO	NO	NO
Outer Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	NO	NO
Height	NO	NO	NO
Cross Stretcher	NO	NO	NO
Depth Spacing	NO	NO	NO
Long Stretcher	NO	NO	NO
Width Front Spacing	NO	NO	NO
Width Rear Spacing	NO	NO	NO
Radial Stretcher	NO	NO	NO
Inner Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	NO	NO
Height	NO	NO	NO
Stretchers Panel	NO	NO	NO
Thickness	NO	NO	NO
Base Guides	N/A	N/A	N/A
Width	NO	NO	NO
Depth	NO	NO	NO
Front Radius	NO	NO	NO
Rear Radius	NO	NO	NO
Base Front Rail	NO	NO	NO
Base Back Rail	NO	NO	NO
Base Side Rail	NO	NO	NO

Height	NO	NO	NO
Height Spacing	NO	NO	NO
Back-Seat Angle	YES	NO	NO
Top Radius	NO	NO	NO
Bottom Radius	NO	NO	NO
Width	NO	NO	NO
Taper Width	NO	NO	NO
Back Upright	NO	NO	NO
Height	NO	NO	NO
Back Top Rail	NO	NO	NO
Back Bottom Rail	NO	NO	NO
Outer Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Height	NO	YES	NO
Depth	NO	YES	NO
Back Cross Rail	NO	YES	NO
Height	NO	NO	NO
Number	NO	YES	NO
Back Splat	NO	NO	NO
Width Top Spacing	NO	NO	NO
Width Bottom Spacing	NO	NO	NO
Number	NO	NO	NO
Back Radial Rail	NO	NO	NO
Inner Frame Section	NO	YES	YES
Diameter	NO	NO	NO
Width/Height	NO	YES	YES
Depth	NO	YES	YES
Back Panel	NO	NO	NO
Thickness	NO	NO	NO
Stretchers Guides	N/A	N/A	N/A
Height	YES	NO	NO
Tilt Angle	NO	NO	NO
Front Radius	NO	NO	NO
Rear Radius	NO	NO	NO
Front Stretcher	NO	NO	YES
Height	NO	NO	NO
Back Stretcher	NO	NO	YES
Height	NO	YES	NO
Side Stretcher	YES	NO	YES
Outer Frame Section	YES	YES	NO
Diameter	NO	NO	YES
Width/Depth	YES	YES	NO
Height	YES	YES	NO
Cross Stretcher	NO	NO	NO
Depth Spacing	NO	NO	NO
Long Stretcher	NO	NO	NO
Width Front Spacing	NO	NO	NO
Width Rear Spacing	NO	NO	NO
Radial Stretcher	NO	NO	NO
Inner Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	NO	NO
Height	NO	NO	NO
Stretchers Panel	NO	NO	NO
Thickness	NO	NO	NO
Base Guides	N/A	N/A	N/A
Width	NO	NO	NO
Depth	NO	NO	NO
Front Radius	NO	NO	NO
Rear Radius	NO	NO	NO
Base Front Rail	NO	NO	NO
Base Back Rail	NO	NO	NO
Base Side Rail	NO	YES	NO

Outer Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	NO	NO
Height	NO	NO	NO
Base Cross Rail	NO	NO	NO
Depth Spacing	NO	NO	NO
Base Long Rail	NO	NO	NO
Width Front Spacing	NO	NO	NO
Width Rear Spacing	NO	NO	NO
Base Radial Rail	NO	NO	NO
Number	NO	NO	NO
Inner Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	NO	NO
Height	NO	NO	NO
Base Panel	NO	NO	NO
Thickness	NO	NO	NO
Arms Guides	N/A	N/A	N/A
Height	NO	NO	NO
Depth	NO	NO	NO
Depth Rear Spacing	NO	NO	NO
Tilt Angle	NO	NO	NO
Front Radius	NO	NO	NO
Rear Radius	NO	NO	NO
Arm Front Support	NO	NO	NO
Arm Back Support	NO	NO	NO
Armrest	NO	NO	NO
Outer Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width	NO	NO	NO
Depth/Height	NO	NO	NO
Arm Side Support	NO	NO	NO
Depth Top Spacing	NO	NO	NO
Depth Bottom Spacing	NO	NO	NO
Section	NO	NO	NO
Diameter	NO	NO	NO
Width	NO	NO	NO
Depth	NO	NO	NO
Arm Panel	NO	NO	NO
Thickness	NO	NO	NO

Outer Frame Section	NO	YES	NO
Diameter	NO	NO	NO
Width/Depth	NO	YES	NO
Height	NO	YES	NO
Base Cross Rail	NO	NO	NO
Depth Spacing	NO	NO	NO
Base Long Rail	NO	NO	NO
Width Front Spacing	NO	NO	NO
Width Rear Spacing	NO	NO	NO
Base Radial Rail	NO	NO	NO
Number	NO	NO	NO
Inner Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width/Depth	NO	NO	NO
Height	NO	NO	NO
Base Panel	NO	NO	NO
Thickness	NO	NO	NO
Arms Guides	N/A	N/A	N/A
Height	NO	NO	NO
Depth	NO	NO	NO
Depth Rear Spacing	NO	NO	NO
Tilt Angle	NO	NO	NO
Front Radius	NO	NO	NO
Rear Radius	NO	NO	NO
Arm Front Support	NO	NO	NO
Arm Back Support	NO	NO	NO
Armrest	NO	NO	NO
Outer Frame Section	NO	NO	NO
Diameter	NO	NO	NO
Width	NO	NO	NO
Depth/Height	NO	NO	NO
Arm Side Support	NO	NO	NO
Depth Top Spacing	NO	NO	NO
Depth Bottom Spacing	NO	NO	NO
Section	NO	NO	NO
Diameter	NO	NO	NO
Width	NO	NO	NO
Depth	NO	NO	NO
Arm Panel	NO	NO	NO
Thickness	NO	NO	NO

Completeness	**DE**	**JE**	**TE**
	DE6	**JE6**	**TE4**
Reproducible Features (Fr)	26	18	35
Irreproducible Features (Fi)	17	27	7
Completeness	**0.60**	**0.40**	**0.83**

Appendix 6.F.3 Synthetic Test

Table 18 Synthetic Test to ChairDNA

		REPRODUCIBLE	
NAME	**ID**	**MCG**	**ChairDNA**
Legs	**L**	**N/A**	**N/A**
Legs (Number)	**N/A**	**N/A**	**N/A**
Pedestal	L1C	YES (SAMPLE)	YES (SAMPLE)
1-Legged Cantilever	L1F	YES	YES
1-Legged Reverse Cantilever	L1B	YES	YES
Cantilever	L2F	YES (SAMPLE)	YES (SAMPLE)
Reverse Cantilever	L2B	YES (SAMPLE)	YES (SAMPLE)
2-Legged Pedestal	L2FB	YES	YES
2-Legged Pedestal	L2S	YES	YES
3-Legged	L3F	YES (SAMPLE)	YES (SAMPLE)
Reverse 3-Legged	L3B	YES (SAMPLE)	YES (SAMPLE)
4-Legged	L4	YES (SAMPLE)	YES (SAMPLE)
Double legged	L4+	YES (SAMPLE)	NO
Legs (Shape)	**N/A**	**N/A**	**N/A**
X-legged	L4X1	YES	YES
X-legged	L4XII	YES	YES
X-legged	L4X=	YES	YES
X-legged	L4XC	YES	YES
X-legged	L4+X	YES	NO
4-Legged Solid	L4●1	YES (SAMPLE)	YES (SAMPLE)
Parallel	L4●II	YES	YES
Parallel (reverse)	L4●=	YES	YES
X-shaped	L4●X	YES	YES
U-shaped	L4●U	YES	YES
U-shaped (reverse)	L4●UR	YES	YES
Monolithic Base	L4●O	YES	YES
Legs (Angle)	**N/A**	**N/A**	**N/A**
Angled Outward - Splayed/Raked	L4OSR	YES (SAMPLE)	YES (SAMPLE)
Angled Outward - Raked	L4OR	YES (SAMPLE)	YES (SAMPLE)
Angled Outward - Splayed	L4OS	YES	YES
Angled Inward - Splayed/Raked	L4ISR	YES	YES
Angled Inward - Raked	L4IR	YES	YES
Angled Inward - Splayed	L4IS	YES	YES
Legs (Section Shape)	**LS**	**N/A**	**N/A**
Round Section	L4SO	YES (SAMPLE)	YES (SAMPLE)
Square Section	L4S□	YES (SAMPLE)	YES (SAMPLE)
Tapered	L4SΔ	YES (SAMPLE)	YES (SAMPLE)
Seat	**S**	**N/A**	**N/A**
Seat (Outer Shape)	**N/A**	**N/A**	**N/A**
Square Seat	S□	YES (SAMPLE)	YES (SAMPLE)
Circular Seat	SO	YES (SAMPLE)	YES (SAMPLE)
Semicircular Seat	SΦ	YES (SAMPLE)	YES (SAMPLE)
Trapezoid Seat	SΔ	YES (SAMPLE)	YES (SAMPLE)
Seat (Shape)	**N/A**	**N/A**	**N/A**
Single	S1	YES (SAMPLE)	YES (SAMPLE)
Parallel	SII	YES (SAMPLE)	YES (SAMPLE)

Parallel (reverse)	S=	YES (SAMPLE)	YES (SAMPLE)
Mesh	S#	YES (SAMPLE)	YES (SAMPLE)
X-shaped	SX	YES (SAMPLE)	YES (SAMPLE)
H-shaped	SH	YES (SAMPLE)	YES (SAMPLE)
H-shaped (reverse)	SHR	YES (SAMPLE)	YES (SAMPLE)
U-shaped	SU	YES (SAMPLE)	YES (SAMPLE)
U-shaped (reverse)	SUR	YES (SAMPLE)	YES (SAMPLE)
3-Star	S*3	YES (SAMPLE)	YES (SAMPLE)
5-Star	S*5	YES	YES
Box	SO	YES (SAMPLE)	YES (SAMPLE)
Solid	S●	YES (SAMPLE)	YES (SAMPLE)
Back	**B**	**N/A**	**N/A**
Back (Inner Shape)	**N/A**	**N/A**	**N/A**
Single	B1	YES (SAMPLE)	YES (SAMPLE)
Splat	BII	YES (SAMPLE)	YES (SAMPLE)
Ladder back	B=	YES (SAMPLE)	YES (SAMPLE)
Mesh	B#	YES (SAMPLE)	YES (SAMPLE)
X-shaped	BX	YES (SAMPLE)	YES (SAMPLE)
Open back	BO	YES (SAMPLE)	YES (SAMPLE)
Solid	B●	YES (SAMPLE)	YES (SAMPLE)
Back (Outer Shape)	**N/A**	**N/A**	**N/A**
Square	B□	YES (SAMPLE)	YES (SAMPLE)
Circular	BO	YES (SAMPLE)	YES (SAMPLE)
Semi-circular	BΦ	YES (SAMPLE)	YES (SAMPLE)
Trapezoid	BΔ	YES (SAMPLE)	YES (SAMPLE)
Back (Height)	**N/A**	**N/A**	**N/A**
Low-backed	BS	YES (SAMPLE)	YES (SAMPLE)
Medium-backed	BM	YES (SAMPLE)	YES (SAMPLE)
High-backed	BL	NO	NO
Stretchers	**LS**	**N/A**	**N/A**
Stretchers (Shape)	**N/A**	**N/A**	**N/A**
None	LSØ	YES (SAMPLE)	YES (SAMPLE)
Single	LS1	YES (SAMPLE)	YES (SAMPLE)
Parallel	LSII	YES (SAMPLE)	YES (SAMPLE)
Parallel (reverse)	LS=	YES (SAMPLE)	YES (SAMPLE)
X-shaped	LSX	YES (SAMPLE)	YES (SAMPLE)
H-shaped	LSH	YES (SAMPLE)	YES (SAMPLE)
H-shaped (reverse)	LSHR	YES	YES
U-shaped	LSU	YES (SAMPLE)	YES (SAMPLE)
U-shaped (reverse)	LSUR	YES	YES
Box	LSO	YES (SAMPLE)	YES (SAMPLE)
Solid	LS●	YES (SAMPLE)	YES (SAMPLE)
Stretchers (Outer Shape)	**N/A**	**N/A**	**N/A**
Square	LS□	YES (SAMPLE)	YES (SAMPLE)
Circular	LSO	YES (SAMPLE)	YES (SAMPLE)
Semi-circular	LSΦ	YES	YES
Trapezoid	LSΔ	YES (SAMPLE)	YES (SAMPLE)
Base	**LB**	**N/A**	**N/A**
Base (Shape)	**N/A**	**N/A**	**N/A**
None	LBØ	YES (SAMPLE)	YES (SAMPLE)
Single	LB1	YES	YES
Sled	LBII	YES (SAMPLE)	YES (SAMPLE)

Parallel (reverse)	LB=	YES	YES
X-shaped	LBX	YES (SAMPLE)	YES (SAMPLE)
H-shaped	LBH	YES	YES
H-shaped (reverse)	LBHR	YES	YES
U-shaped	LBU	YES	YES
U-shaped (reverse)	LBUR	YES (SAMPLE)	YES (SAMPLE)
3-Star	LB*3	YES (SAMPLE)	YES (SAMPLE)
5-Star	LB*5	YES	YES
Box	LBO	YES (SAMPLE)	YES (SAMPLE)
Solid	LB●	YES (SAMPLE)	YES (SAMPLE)
Base (Outer Shape)	**N/A**	**N/A**	**N/A**
Square	LB□	YES (SAMPLE)	YES (SAMPLE)
Circular	LBO	YES (SAMPLE)	YES (SAMPLE)
Semi-circular	LBΦ	YES (SAMPLE)	YES (SAMPLE)
Trapezoid	LBΔ	YES	YES
Arms	**A**	**N/A**	**N/A**
Arms (Number)	**N/A**	**N/A**	**N/A**
Armless chair	AØ	YES (SAMPLE)	YES (SAMPLE)
Armchair	A2	YES (SAMPLE)	YES (SAMPLE)
Arms (Shape)	**N/A**	**N/A**	**N/A**
Solid armchair	A●	YES (SAMPLE)	YES (SAMPLE)
Arms (Outer Shape)	**N/A**	**N/A**	**N/A**
Square	A□	YES (SAMPLE)	YES (SAMPLE)
Circular	A O	YES	YES
Semi-circular	AΦ	YES (SAMPLE)	YES (SAMPLE)
Trapezoid	AΔ	YES (SAMPLE)	YES (SAMPLE)
Chair (Pieces Number)	**P**	**N/A**	**N/A**
One-piece	PA	N/A	N/A
Shell	PS	N/A	N/A
Arm Shell	PSA	N/A	N/A
Legs (Curves)	**LC**	**N/A**	**N/A**
Straight	LCØ	YES (SAMPLE)	YES (SAMPLE)
Single Curvature	LC1	N/A	N/A
Double Curvature	LC2	N/A	N/A
Multiple Curvature	LC3	N/A	N/A

Reproducible Types (New)		31	30
Reproducible Types (Sample)		71	70
Reproducible Types		102	100
Irreproducible Types		1	3
Completeness		**0.97**	**0.91**

User Evaluation of ChairDNA

Appendixes

7

7 USER EVALUAION OF CHAIRDNA: APPENDIXES

Appendix 7.A First Evaluation

Appendix 7.A.1 Briefing

BRIEFING

1. **Context:** This experiment is carried out in the context of the PhD in Design in FA/UL entitled "Contributions to the study of the form: development of a computational model applied to the chair", whose goal is the development of a prototype of a computational tool for the design of multipurpose chairs.

2. **Goal:** To perform a preliminary evaluation of the usability and usefulness of the ChairDNA prototype, that is currently under development. The input of potential users is important to improve several aspects of the tool.

3. **Tasks:**
    1. Formalize an initial chair concept (and send it by e-mail);
    2. Develop the concept in the class, with the goal of designing a multipurpose chair, by using or not the tool ChairDNA;
    3. Record and describe the form generation sequence;
    4. Save the final 3D digital model in the STL file format, and print a **1/8** scale model at the LPR (Rapid Prototyping Lab of FA/UL), in the **ZPrinter 350** printer or in the **Beethefirst** printer (http://lpr.fa.ulisboa.pt).

4. **ChairDNA Installation:**
    1. Requirements: Windows; Rhinoceros or AutoCAD; Internet connection
    2. Install Racket (maximum duration of 30 min);
    3. Download ChairDNA for Rhinoceros or AutoCAD (http://chairdna.wordpress.com – Download – Pass: 88cadeira), version 1.1;
    4. Open a new file in AutoCAD or Rhinoceros;
    5. Open the ChairDNA file in Racket and click Run.

5. **ChairDNA Interface**: The graphical interface controls a 3D model displayed in AutoCAD or Rhinoceros. The interface is organized by *tabs* that group the parts of the chair. Each *tab* contains several *check-box*; when a *check-box* is checked, a part of the chair is inserted, and its parameters can be controlled by *sliders*. There are sequences that have to be respected, that is, certain check-boxes only become enabled when others are previously activated.

6. **Other Tools:** Any of the traditional design tools (drawing, models, diagrams) can be used. The 3D CAD modelling tools can only be used to edit the model created with the ChairDNA tool.

7. **Record:** The participants should record the screen while they are working with the tool (examples of software: aTube Catche, Cam Studio).

8. **Sessions:**
    1. **Presentation and demonstration of ChairDNA:** 19 November 2014;
    2. **Installation and first experiments with ChairDNA:** 21 November 2014;
    3. **Experimenting and designing with ChairDNA (2):** 3 December 2014;
    4. **Participant's presentations:** 17 & 19 December 2014, 7 January 2015;
    5. **Filling the online questionnaire:** until 11 February 2015.

Appendix 7.A.2 Post-task Interview Script

ID: Participant: _____, Date: __/__/__

B	Description of the task: ChairDNA in a chair design process
B1	What was the digital tool you used for the main modelling?
B2	Have you used a second digital tool to operate some changes? If yes, indicate the CAD software that you used.
B3	If you answered yes in the previous question, indicate the changes made.
B4	Describe your design process, from the initial idea to the final design.
B5	What is the scale of the model?
B6	What printer did you use to fabricate the model?
B7	What was the price for printing the model?
B8	Did you change the 3D model because of 3D printing constraints? If yes, indicate the changes made.
B9	What materials did you ideate for the chair solution?
B10	Indicate some suggestions, observations, or difficulties concerning ChairDNA.

Appendix 7.A.3 Post-test Questionnaire Script

Title: ChairDNA usage in the discipline *Parametric Modelling and Digital Prototyping in Design*

***Welcome message*:** The present questionnaire reflects the experience undertaken with students from the discipline *Parametric Modelling and Digital Prototyping in Design*, which goal was to evaluate the usability of the ChairDNA prototype in the multipurpose chair design process. This experience is part of the PhD research *Contributions to the study of the form: development of a computational model applied to the chair*.

A	**Participant Profile (Demographic Profile)**
A1	* Name
A2	* Age *Only numbers may be entered in this field*

A	**Participant Profile (Experience in 3D CAD applications)**
A3	* Rank the computer graphics software(s) by order of importance in your design process. *Click on an item in the list on the left, starting with your highest ranking item, moving through to your lowest ranking item.*

Your choices	Your ranking
AutoCAD	1:
Rhinoceros	2:
3D Studio Max	3:
SketchUp	4:
Vectorworks	5:

A4 * At what design phase(s) do you use each of the software?

	Research	Concept	Development	Detail	Production	N/A
AutoCAD	❍	❍	❍	❍	❍	❍
Rhinoceros	❍	❍	❍	❍	❍	❍
3D Studio Max	❍	❍	❍	❍	❍	❍
SketchUp	❍	❍	❍	❍	❍	❍
Vectorworks	❍	❍	❍	❍	❍	❍

A5 * At what design task(s) do you use each of the software?

	Ideation	Technical Drawing	3D Modelling	Rendering	Analysis/ Optimization	Digital Fabrication	Commu-nication	Management	N/A
AutoCAD	❍	❍	❍	❍	❍	❍	❍	❍	❍
Rhinoceros	❍	❍	❍	❍	❍	❍	❍	❍	❍
3D Studio Max	❍	❍	❍	❍	❍	❍	❍	❍	❍
SketchUp	❍	❍	❍	❍	❍	❍	❍	❍	❍
Vector-works	❍	❍	❍	❍	❍	❍	❍	❍	❍

A6	* Which operating system do you usually use in your design process?

	Choose one of the following answers ❍ Windows ❍ Mac OS X ❍ Linux

A	**Participant Profile (Experience in Chair Design)**
A7	* For each of the contexts listed below, what phase do you reached in chair design process?

	Concept	Development	Prototype	Production	N/A
Academic projects	❍	❍	❍	❍	❍
Design competition	❍	❍	❍	❍	❍
Design Studio	❍	❍	❍	❍	❍
Industry	❍	❍	❍	❍	❍

B	**Description of the task: ChairDNA in the concept phase of a chair design process**
B1	* Which computer graphics software did you use along with ChairDNA? *Choose one of the following answers* ❍ AutoCAD ❍ Rhino 4 ❍ Rhino 5
B2	* What tools did you use (besides ChairDNA and AutoCAD/Rhino), and at what phase of the process?

	Before using ChairDNA	While using ChairDNA	After Using ChairDNA
Drawing	❍	❍	❍
Diagrams	❍	❍	❍
Models	❍	❍	❍
CAD Software	❍	❍	❍

B3	* What materials did you envision for the chair solution?
B4	* Did you consider the materials as a constraining factor during the process of form generation? *Choose one of the following answers* ❍ Yes ❍ No
B5	* After using ChairDNA, did you change the 3D model in some CAD software? If yes, indicate the changes made. *Choose one of the following answers* ❍ Yes ❍ No Please enter your comment here:
B6	* What technology(s) did you use for the 3D printing of the chair scale model? *Check any that apply.* ❐ FDM ❐ 3D Printing (3DP)

	❒ Laser Cutting ❒ CNC Milling
B7	* Did you change the 3D model because of 3D printing constraints? If yes, indicate the changes made. *Choose one of the following answers* Please enter your comment here: ❍ Yes ❍ No
B8	* What was your main expectation when using ChairDNA? *Check any that apply.* ❒ Implement a design ❒ Explore designs ❒ Both ❒ Other:
B9	* Describe in general the design process of the chair, since the initial idea until the final solution.

C	**ChairDNA usability** *Rate the answers on a scale of 1 to 5, being: 1- Strongly disagree and 5- Strongly agree.*
C1	* Are the commands names appropriate? Indicate suggestions (optional). *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C2	* Is the distribution of the commands through the windows adequate? Indicate suggestions (optional). *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C3	* Are the commands available in the program enough? Specify commands that could be included. *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2

	❍ 3 ❍ 4 ❍ 5
C4	* Is the activation sequence of the commands adequate? Provide additional suggestions. *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C5	* Is the program easy to use? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C6	* Is the program coherent as a whole? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C7	* Was the usage experience good? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C8	* Does the program adapt to the user needs? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C9	* Was the program easy to learn? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C10	* The efficiency (response time) of the program is good? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C11	Indicate (if applicable) program malfunctions (bugs).

D	**ChairDNA usefulness as a design tool** *Rate the answers on a scale of 1 to 5, being: 1- Strongly disagree and 5- Strongly agree.*
D1	* Does the program limit decision making? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D2	* Did the program allow the emergence of solutions that you had not initially thought of? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D3	* Are you satisfied with the solution achieved with the aid of the program? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D4	* Do you consider that the logic of form generation provided by the program (addition of chair components) is appropriate to the chair design process? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5

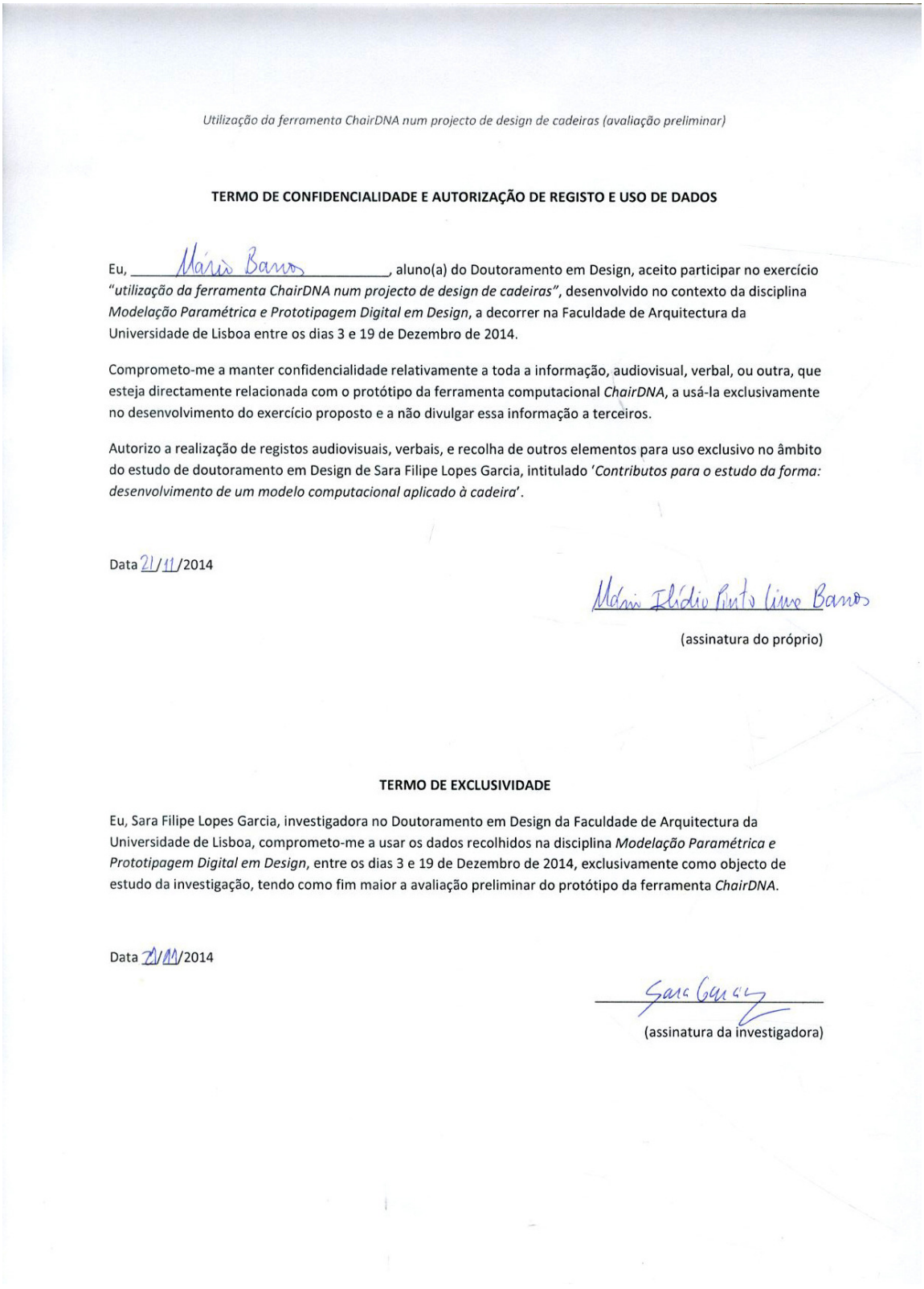
D5	* Do you consider that the program provided you with new knowledge on the form and structure of the chairs? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D6	* Do you consider that the program is a useful complement to the design process? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D7	* What further features should be included in the program? *Check any that apply.* ❐ Curves ❐ Joints ❐ Materials ❐ Structural analysis ❐ N/A ❐ Other:
D8	* What further chair types should be included in the program? *Check any that apply.* ❐ Sun lounger ❐ Longue chair ❐ Office chair ❐ Children's Chair ❐ Stool/Bench ❐ N/A ❐ Other:
D9	* Would you like to use the program in future design projects? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D10	* Indicate strengths of ChairDNA (mention at least one).
D11	* Indicate weaknesses of ChairDNA (please mention at least one).
D12	Indicate additional suggestions/comments that you consider to be relevant for future program developments (optional answer).

End message: Thank you for your collaboration.
***Mandatory questions**
Online questionnaire in LimeSurvey (version 1.92+)

Appendix 7.A.4 Participants List

ID	Name	Profile	Age
SP	Mário Barros	PhD Design Student	34
S1	Ana Maria Farinha	3rd Year Design Student	21
S2	André Coelho	3rd Year Design Student	33
S3	Bárbara Contente	3rd Year Design Student	20
S4	Camila Martinho	3rd Year Design Student	21
S5	Carla Pereira	3rd Year Design Student	21
S6	Francisco Fernandes	3rd Year Design Student	23
S7	Inês Fonseca	3rd Year Design Student	20
S8	Inês Reis Andrade	3rd Year Design Student	22
S9	Inês Pequito Valente	3rd Year Design Student	20
S10	Joana Gonçalves	3rd Year Design Student	20
S11	Joana Maria Terceiro	3rd Year Design Student	20
S12	Joana Maria Pereira	3rd Year Design Student	20
S13	Maria Alexandra Silva	3rd Year Design Student	20
S14	Maria Geraldes	3rd Year Design Student	20
S15	Maria Bateira	3rd Year Design Student	26
S16	Maria Luísa Canto e Castro	3rd Year Design Student	20
S17	Maria Madalena Tuna	3rd Year Design Student	20
S18	Rute Amaral	3rd Year Design Student	21
S19	Sara Encarnação	3rd Year Design Student	21

Appendix 7.A.6 Consent Forms



Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Mário Barros, aluno(a) do Doutoramento em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 21/11/2014

Mário Elídio Pinto Lima Barros

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 21/11/2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.1 Consent form of SP (pilot test)

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Ana Mafalda Telo de Morais Taminha, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Ana Mafalda Taminha

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.2 Consent form of S1

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, André Marques Coelho, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.3 Consent form of S2

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Bárbara Contente, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 03/12/2014

Bárbara Contente

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.4 Consent form of S3

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Camila Martinho, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Camila Martinho

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.5 Consent form of S4

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Carla Pereira, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 03/11/2014

Carla Pereira

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.6 Consent form of S5

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Francisco Fernandes, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

(assinatura do próprio)

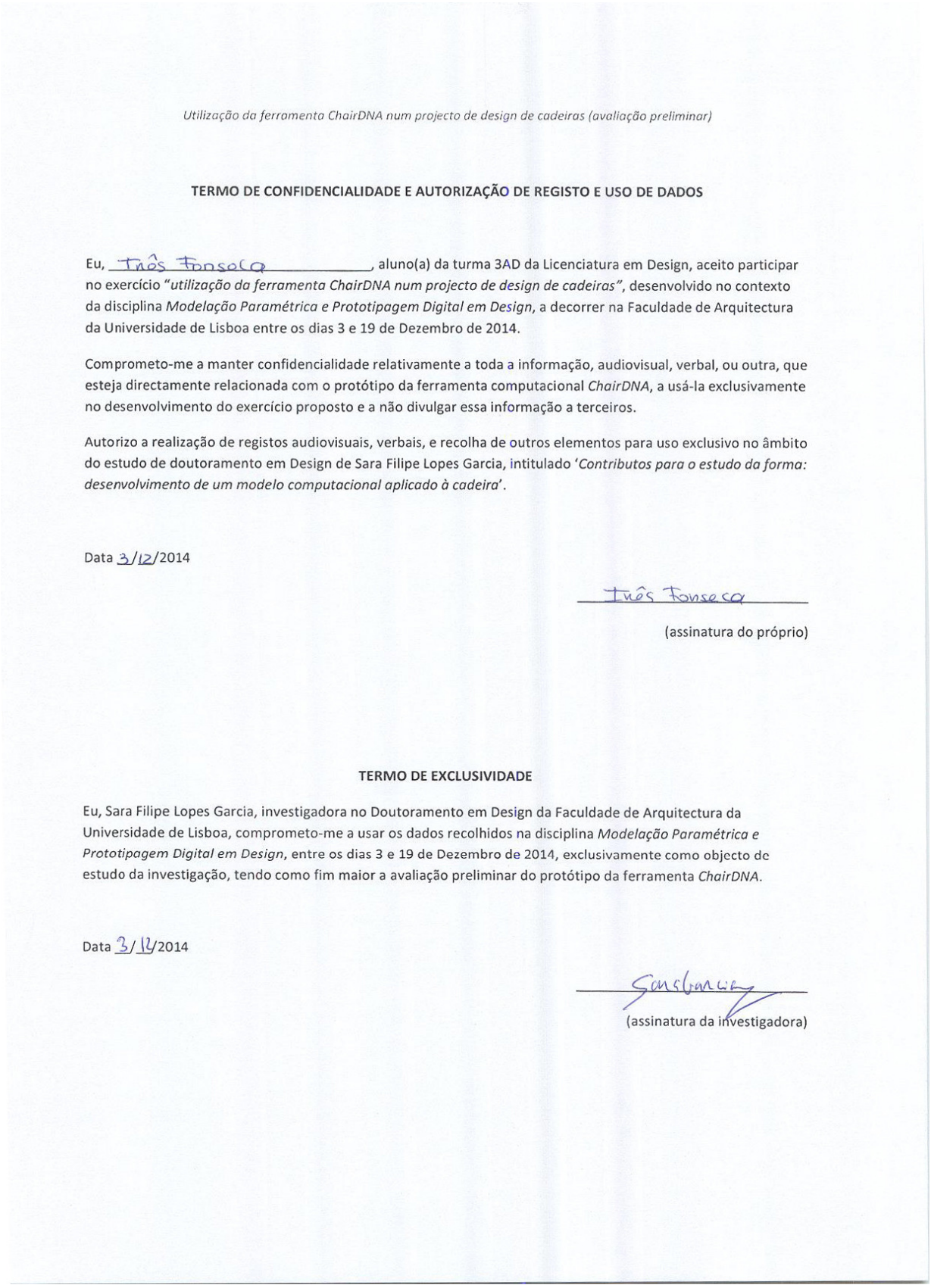
TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.7 Consent form of S6



Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Inês Fonseca, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Inês Fonseca

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.8 Consent form of S7

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Inês Reis, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Inês Reis

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

SaraGarcia

(assinatura da investigadora)

Fig. 7.9 Consent form of S8

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Inês Ferreira Peguito Valente, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 17/12/2014

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 19/12/2014

(assinatura da investigadora)

Fig. 7.10 Consent form of S9

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Joana Gonçalves, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Joana Gonçalves

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

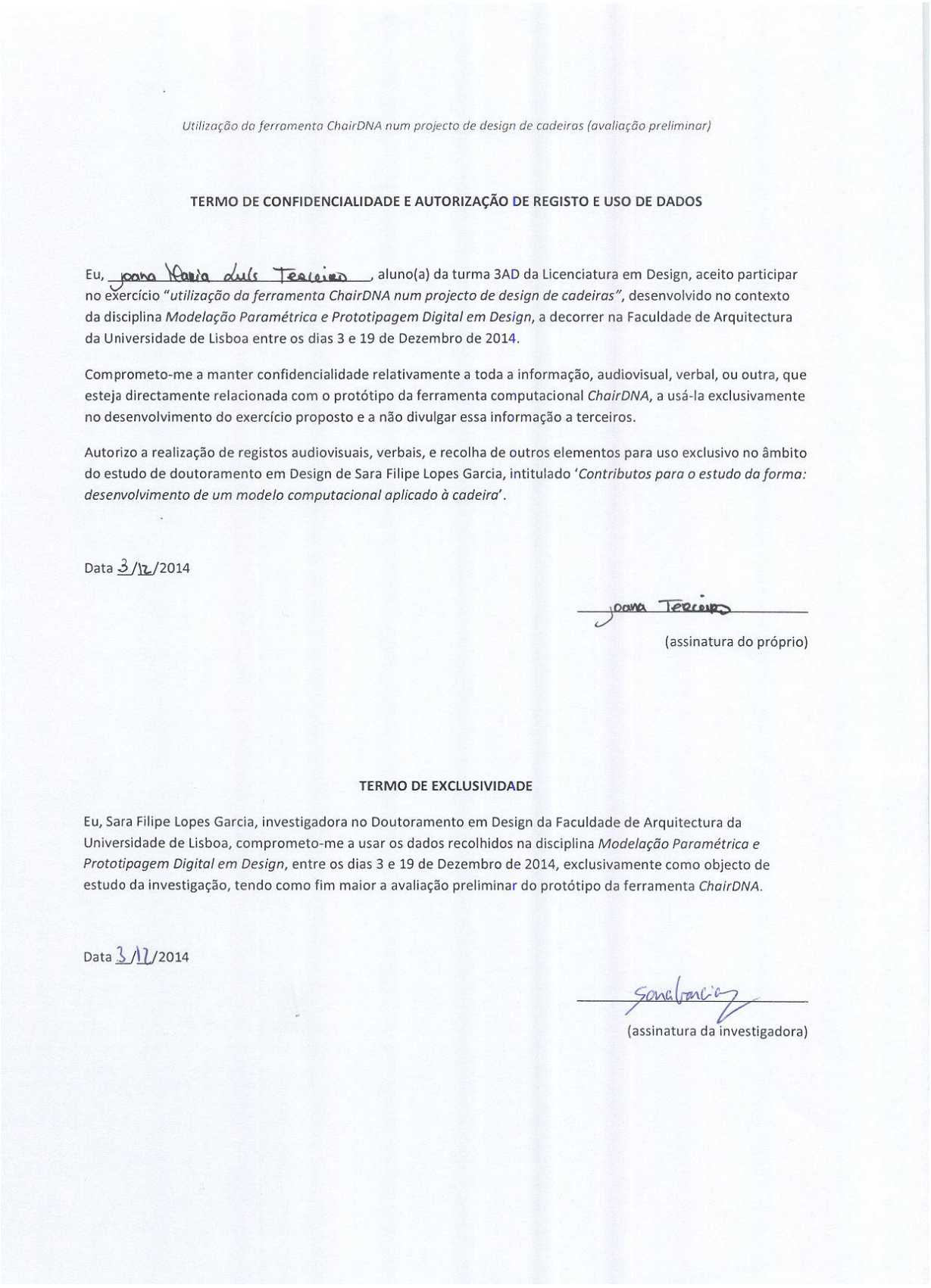
Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.11 Consent form of S10



Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Joana Maria Luís Terceiro, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Data 3/12/2014

Joana Terceiro

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.12 Consent form of S11

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Joana Maria Martins Pereira, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Data 3 / 12 /2014

Joana Pereira

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3 / 12 /2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.13 Consent form of S12

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Alexandra Silva, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 03/12/2014

Maria Alexandra Silva

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 03/12/2014

(assinatura da investigadora)

Fig. 7.14 Consent form of S13

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Maria Geraldes, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Maria Geraldes

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.15 Consent form of S14

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Maria Batista, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício *"utilização da ferramenta ChairDNA num projecto de design de cadeiras"*, desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Data 3/12/2014

Maria Batista

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

SaraGarcia

(assinatura da investigadora)

Fig. 7.16 Consent form of S15

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Maria Luisa Castro, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

(assinatura do próprio)

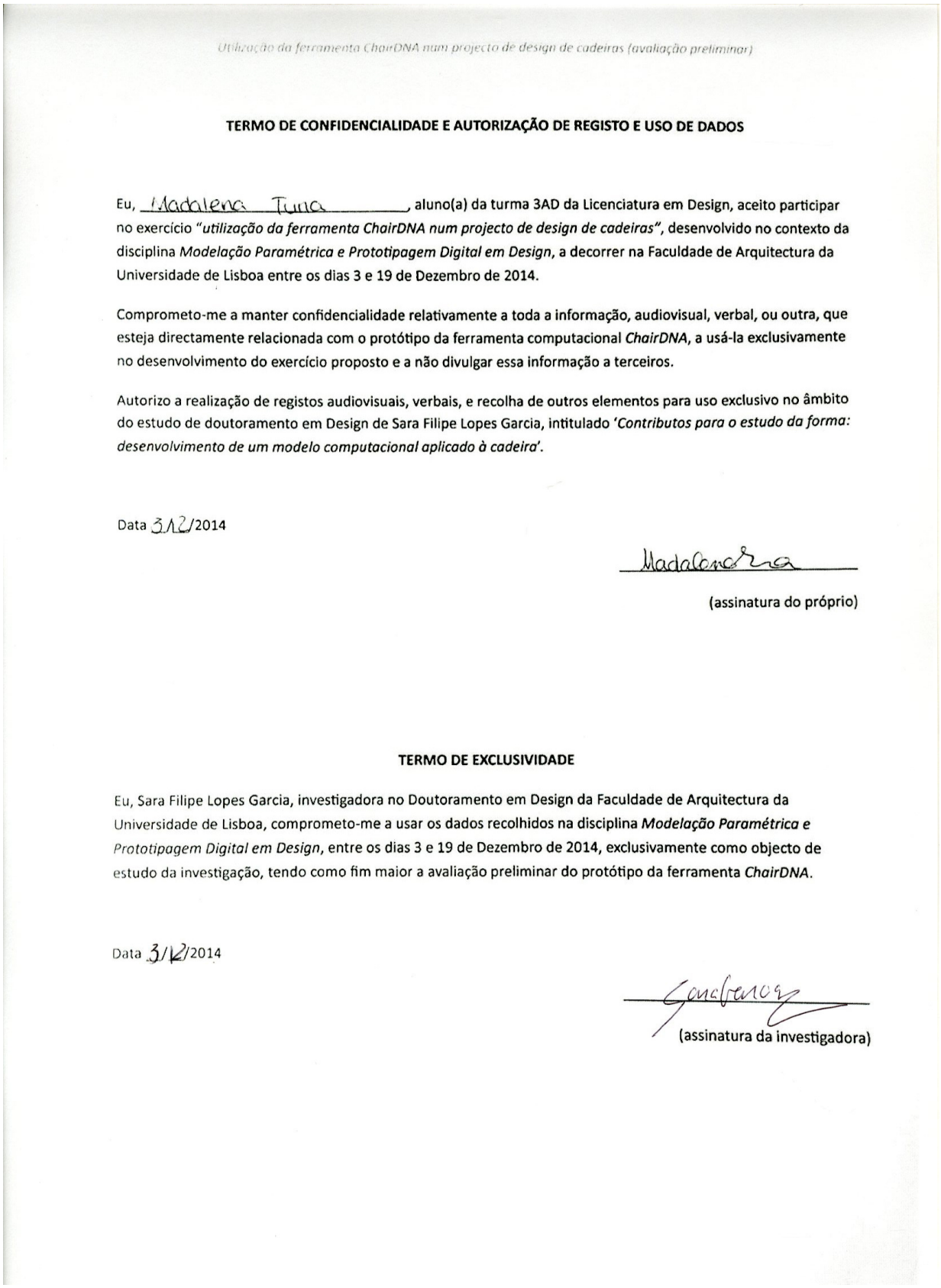
TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.17 Consent form of S16



Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Madalena Tuna, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Madalena Tuna

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.18 Consent form of S17

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Rute Andreia G. Amaral, aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

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Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito do estudo de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Data 3/12/2014

Rute Amaral

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

Sara Garcia

(assinatura da investigadora)

Fig. 7.19 Consent form of S18

Utilização da ferramenta ChairDNA num projecto de design de cadeiras (avaliação preliminar)

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Sara A. R Carvalho aluno(a) da turma 3AD da Licenciatura em Design, aceito participar no exercício "*utilização da ferramenta ChairDNA num projecto de design de cadeiras*", desenvolvido no contexto da disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, a decorrer na Faculdade de Arquitectura da Universidade de Lisboa entre os dias 3 e 19 de Dezembro de 2014.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta computacional *ChairDNA*, a usá-la exclusivamente no desenvolvimento do exercício proposto e a não divulgar essa informação a terceiros.

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Data 3/12/2014

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

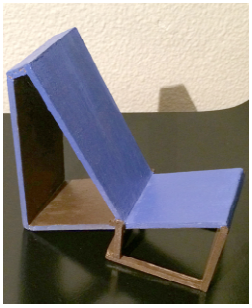
Eu, Sara Filipe Lopes Garcia, investigadora no Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos na disciplina *Modelação Paramétrica e Prototipagem Digital em Design*, entre os dias 3 e 19 de Dezembro de 2014, exclusivamente como objecto de estudo da investigação, tendo como fim maior a avaliação preliminar do protótipo da ferramenta *ChairDNA*.

Data 3/12/2014

(assinatura da investigadora)

Fig. 7.20 Consent form of S19

Appendix 7.A.7 Participants Inspirations



S1 Participant's design (2013)

S2 N/A

S3 Participant's design (2014)

S4 *DSW*, Charles & Ray Eames (1950)

S5 *B32*, Marcel Breuer (1929/30)

S6 *He Said*, Nitzan Cohen (2009)

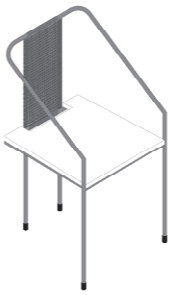
S7 Participant's design (2014)

S8 Participant's design (2014)

S9 *Von Vogelsang*, Philippe Starck (1985)

S10 *DSW*, Charles & Ray Eames (1950)

S11 UNK; Brinquedos Rabisco (2017)



S12 Participant's design (2014)

S13 Participant's design (2014)

Chair with 4 Legs,
round tube,
square shaped seat,
with arms

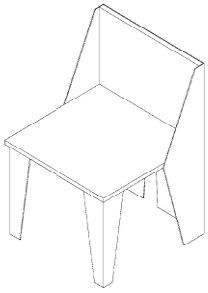
S14 Participant's description (2014)

S15 Participant's design (2013)

S16 *Chair No. 1*, Reed Hansuld (2013)

S17 *Twin-Chairs*, Philippe Nigro (2009); *Ariel*, Joseph Kan (2014)

S18 Participant's design (2014)



S19 Participant's design (2014)

Appendix 7.A.8 Observation Notes

Table 7.1 Observation notes of Evaluation 1

SESSION	TYPE	DESCRIPTION	OCCURENCE NO.
Session 2 (version 1.1.0)	☑ Suggestion	ChairDNA: Include a backend for 3ds Max	1
	? Help	ChairDNA does not work with Mac OS X (the student used one of the faculty desktops)	1
	🖉 Observation	No one used Rhino (because participants do not know the program)	1
	? Help	Why are there disabled commands and how do they get enabled (e.g. as-lr only gets enabled by unchecking bu-lr)	1
	? Help	Explain the meaning of the acronyms	1
	☑ Suggestion	Replace acronyms by text (**corrected in V1.1**)	1
	☠ Bug	Arms: could not uncheck AS-LR	1
Pilot test (version 1.1.0)	🖉 Observation	The participant used Rhino as backend	1
	☑ Suggestion	Display in ChairDNA website the video 'Installation Guide'	1
	? Help	The acronyms in brackets are the related to the parts that need to be checked to enable the ckeck-box	1
	☑ Suggestion	Interface: Include tooltips (pop-up tags that open when one hovers the pointer over an element) indicating what the element is and how it gets enabled	1
	☠ Bug	Sweep is making surfaces and not solids (**corrected in V1.1**)	1
	🖉 Observation	The participant switched the viewport in Rhino to 3 views	1
	? Help	Guides: The participant thought that Solid corresponded to change guides to Solid	1
	? Help	Guides: Indicate Seat Thickness	1
	☑ Suggestion	Add the variable 'Solid' for each part (**corrected in V1.2**)	1
	☑ Suggestion	Add a new variable: Section Angle	1
	☑ Suggestion	Rename Length to Width; and Width to Depth (**corrected in V1.2**)	1
	🖉 Observation	Automatically zoom extents when opening a new chair (**corrected in V1.2**)	1
	✍ Comment	"If I have Seat Length up to 510 then why is the Legs Spacing Crosswise only got up to 300? Oh, because the first is total and the second is half. "	1
	☑ Suggestion	Place the origin of Legs Spacing Crosswise in the seat corner (**corrected in V1.2**)	1
	🖉 Observation	The participant tried to place the legs at the corner of the seat by trial and error	1
	☑ Suggestion	Interface: Include numerical input; to easily copy values from one slider to another (**corrected in V1.2**)	1
	🖉 Observation	The participant made a Seat Box by inserting a Seat Front, Rear and Side	1
	? Help	How to use the commands 'Legs in Seat Box' and 'Seat Box'	1
	☑ Suggestion	Remove 'Seat Box' (**corrected in V1.2**)	1
	? Help	Explain the command 'Seat Surface'	1
	☠ Bug	Seat Side Width is not working	1
	☑ Suggestion	Change the default value of Seat Side Width to match Seat Width	1
	☠ Bug	The Seat Side in Cantilever chairs is not following the Tilt of the Seat (**corrected in V1.2**)	1
	✍ Comment	ChairDNA cannot reproduce a X-Shaped Back inner frame (the grammar is not fully implemented)	1
	🖉 Observation	The participant enabled the Cross Stretcher by a trial and error process	1
	✍ Comment	"My goal is to make a dining chair (without arms)"; the idea arose during the ChairDNA usage "Quero fazer uma cadeira de sala"	1
Session 3 (version 1.1)	🖉 Observation	This session had 18 participants	N/A
	🖉 Observation	Evaluation: Bugs with screen recording software (*aTube Catcher* has virus; *Cam Studio* blocks the computer); the evaluator suggested to capture the screen	**2**
	☒ Error	Installation: The participant had the AutoCAD opened but without a file	1
	☠ Bug	Installation: The file only worked for Rhino4; the participant had to change the 3rd line of the code to place (backend rhino5)	1
	☠ Bug	Installation: ChairDNA does not work in Rhino5 in 32-bits	1
	☑ Suggestion	Include Save. Participants had to start from the beginning every time the program crashed or to continue the work developed in the previous session	**3**
	? Help	To open a new file; Run again the ChairDNA	1
	🖉 Observation	Include a command to open a New file	1
	☒ Error	The participant did not realize that ChairDNA stopped working (bug: Base Cross) and had to Run again ChairDNA	1
	✍ Comment	Performance: ChairDNA is very slow	**2**
	☑ Suggestion	Include numerical input	1
	? Help	Indicate how to remove the guides	1
	? Help	How to make a single planar Leg (switch to Square Section)	1
	🖉 Observation	Include a Leg Surface (**corrected in V1.2**)	1
	✍ Comment	"It looks like a house" The participant tried to reproduce the 'Lion King' rock	1
	? Help	Indicate how to uncross the legs: change the Leg Angles	1
	? Help	Indicate how to change the Seat Angle (in Guides); the participant was searching in the Seat Tab	1
	☑ Suggestion	Distribute the Guides sliders by the Seat and Back Tabs	1
	☠ Bug	Seat Lengthwise (is not making the mirror)	1

	☠ Bug	The participant had a duplicated Seat Outer Frame (with Seat Box and Seat Front, Rear and Side)	**2**
	? Help	With above (delete Seat Front/Rear/ Side; check the Seat Surface Box and the Legs in Seat Box)	1
	☒ Error	The participant had a duplicated Seat Panel (Seat Surface and Seat Surface Box), and could not see the last one	1
	☑ Suggestion	Not allow to make more than one Seat Surface	1
	☠ Bug	Back Upright is not following the Back Angle	1
	? Help	Irreproducible: Back Upright Width (or Splay Angle)	1
	? Help	Irreproducible: Back Upright from Seat Rear or Seat Lengthwise	1
	☒ Error	The participant had a duplicated Back Surface	1
	☑ Suggestion	Not allow to make more than one Back Surface	1
	☠ Bug	The check-box of 'Back Surface' disappears	**3**
	☠ Bug	In Base Cross (again)	1
	☠ Bug	The Armrest (with the Arm Support Front checked) is not placed	1
	✍ Comment	The participant is both exploring the program and trying to follow the initial idea	1

Appendix 7.A.9 Post-task Interview Statistics

[INC] Incomplete answers, i.e., will be further completed with the Questionnaire Statistics

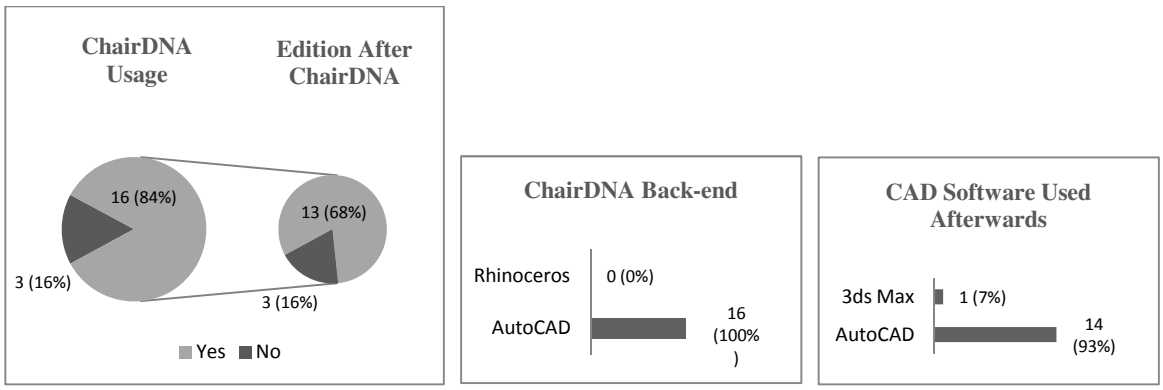


Fig. 7.21 Statistics of B1/B2, B1, B2

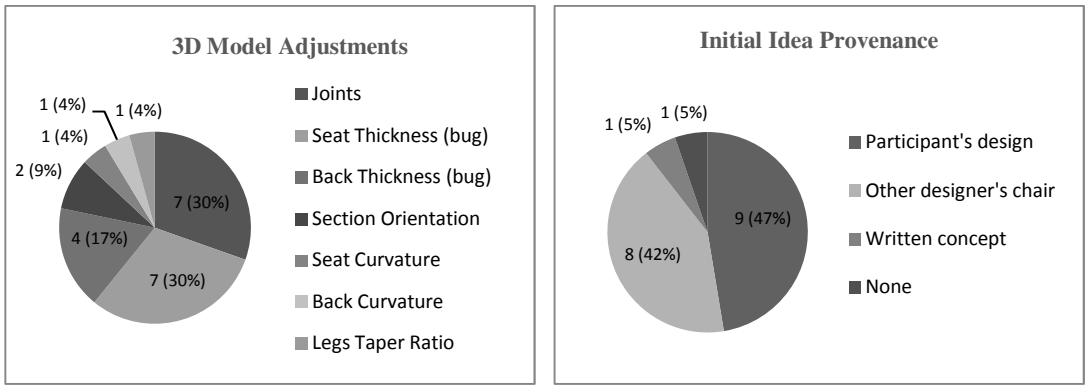


Fig. 7.22 Statistics of B3[INC], B4-1

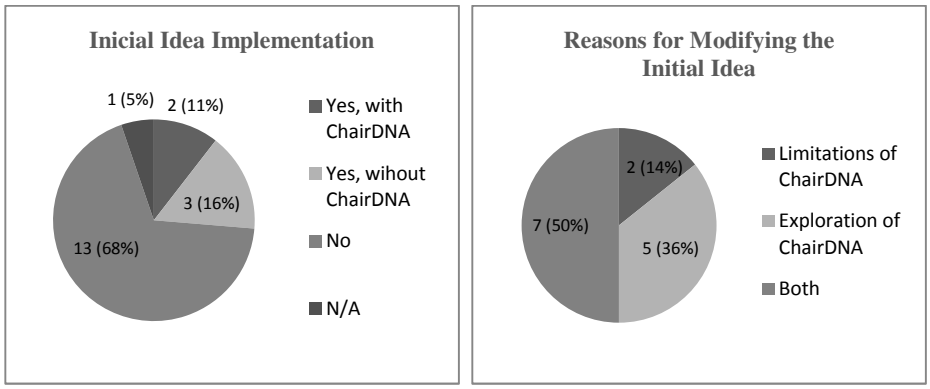


Fig. 7.23 Statistics of B4-2, B4-3

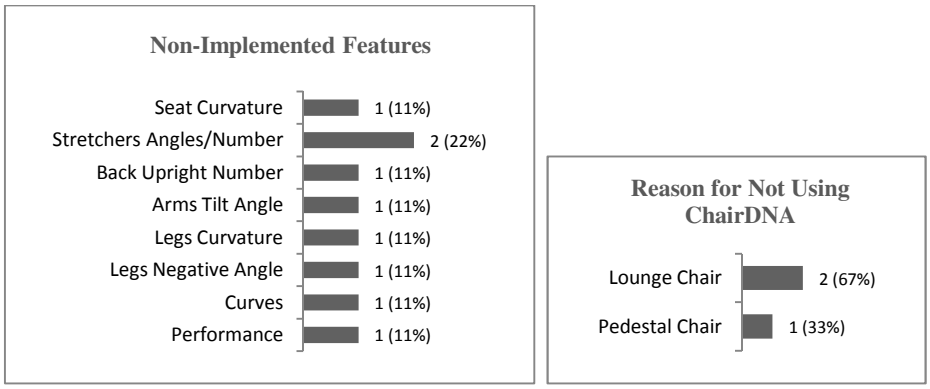


Fig. 7.24 Statistics of B4-4, B4-5

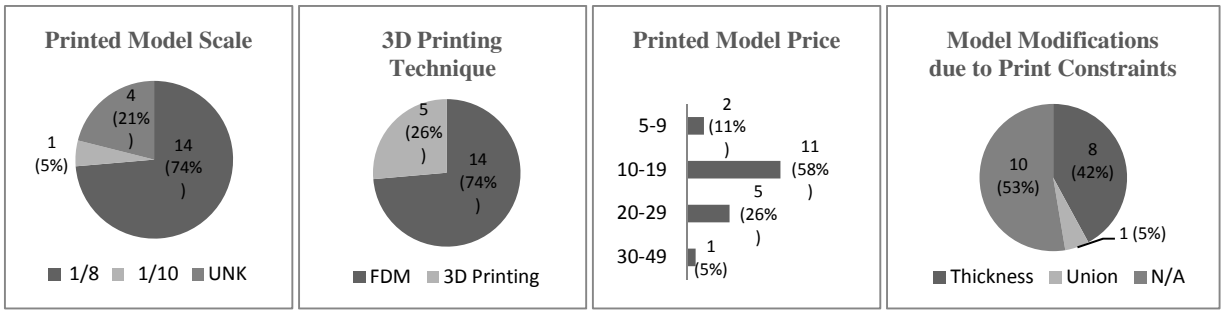


Fig. 7.25 Statistics of B5, B6, B7, B8[INC]

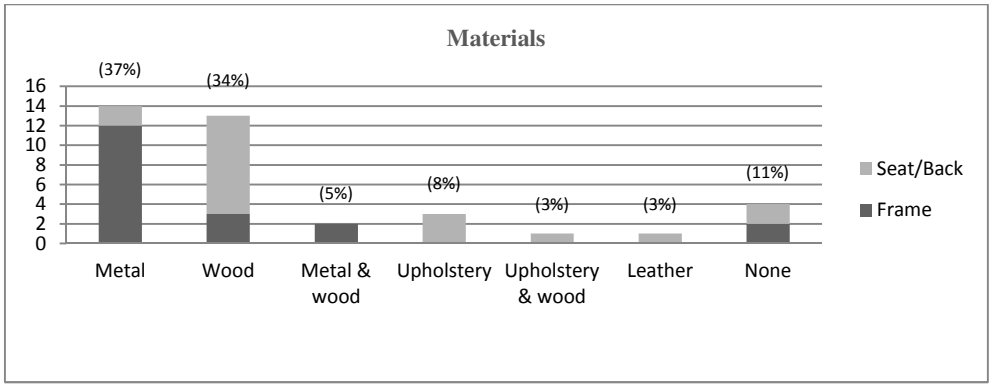


Fig. 7.26 Statistics of B9[INC]

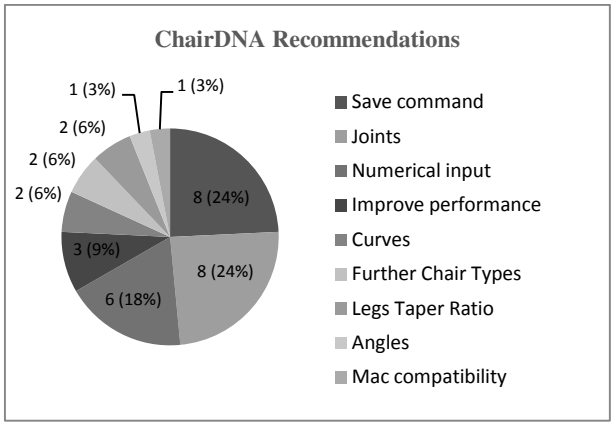


Fig. 7.27 Statistics of B10[INC]

Appendix 7.A.10 User Test Statistics

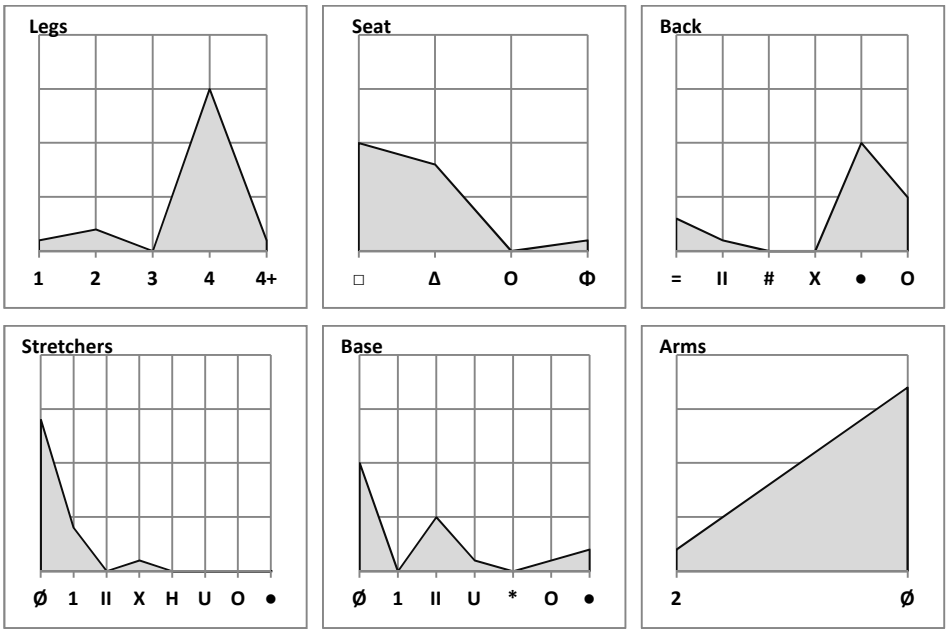
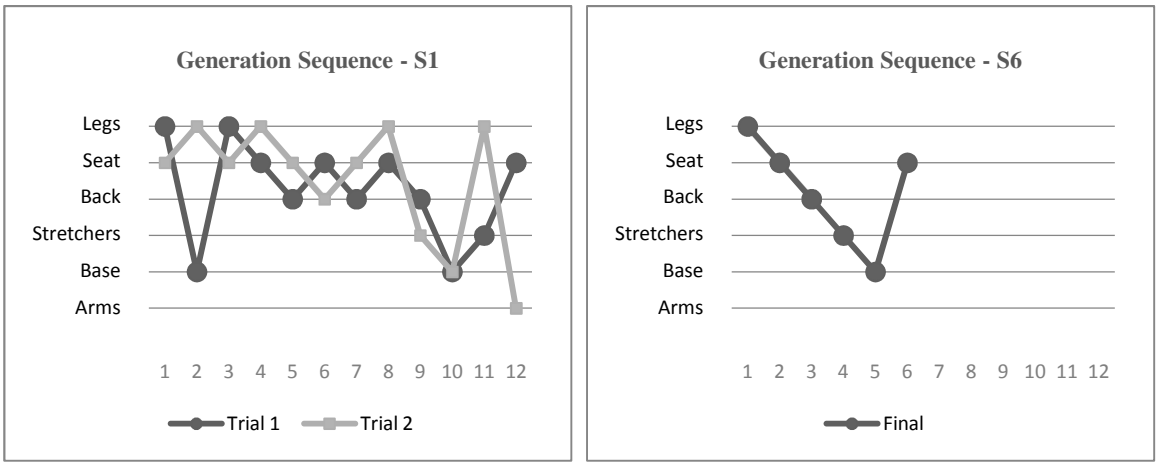


Fig. 7.28 Solutions per chair types



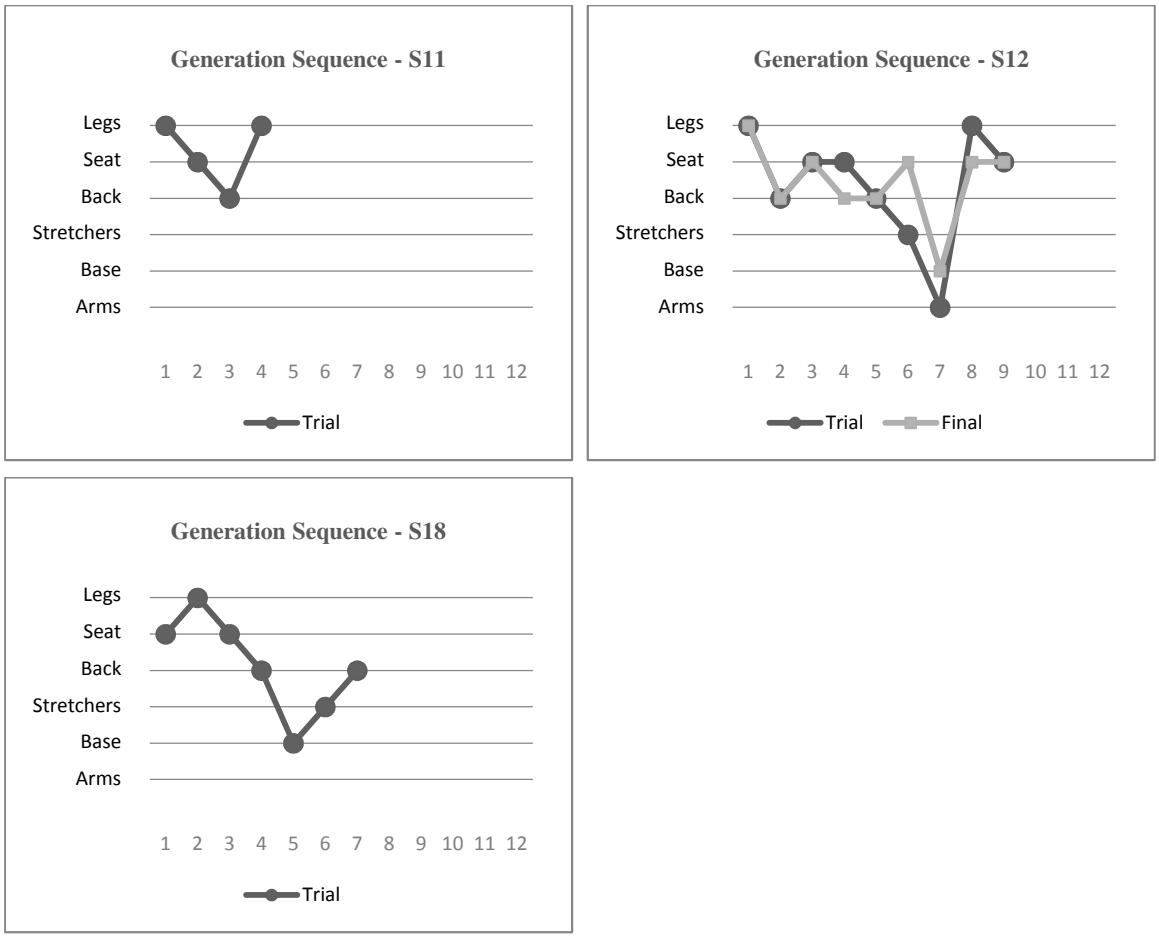


Fig. 7.29 Generation sequence (per participant)

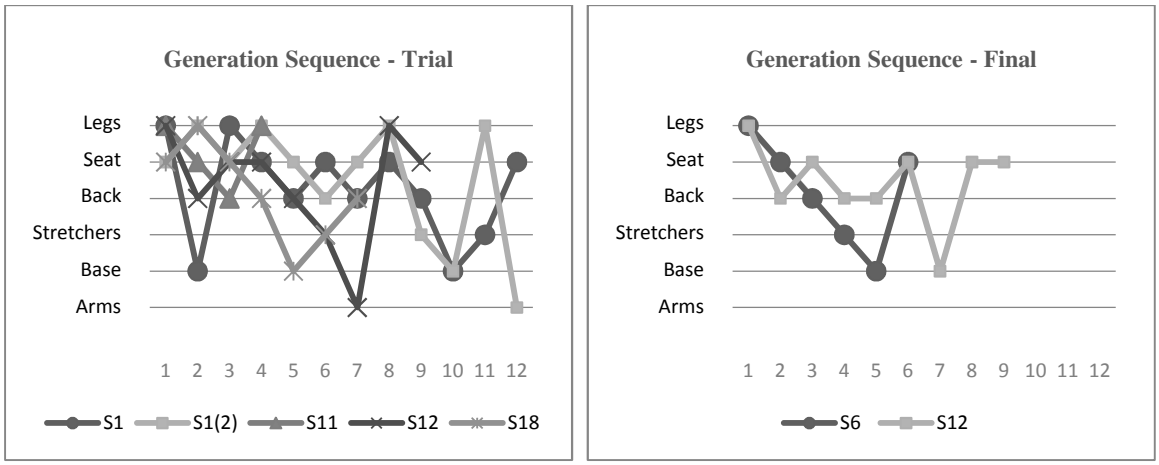


Fig. 7.30 Generation sequence (per task)

Appendix 7.A.11 Post-test Questionnaire Statistics

[C] Complete answers, were combined with the results of the interview

[N/A] Statistics identical to the ones obtained in the interview, and thus are not shown

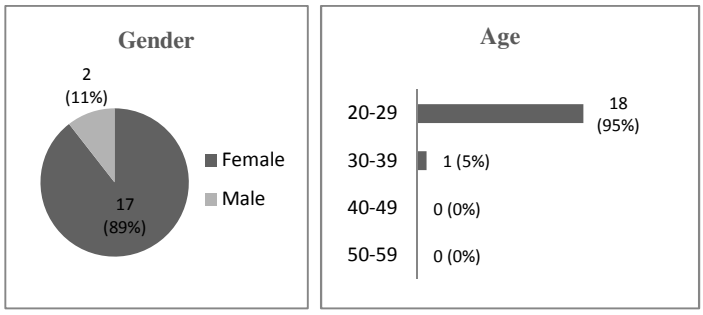


Fig. 7.31 Statistics of A1[C], A2[C]

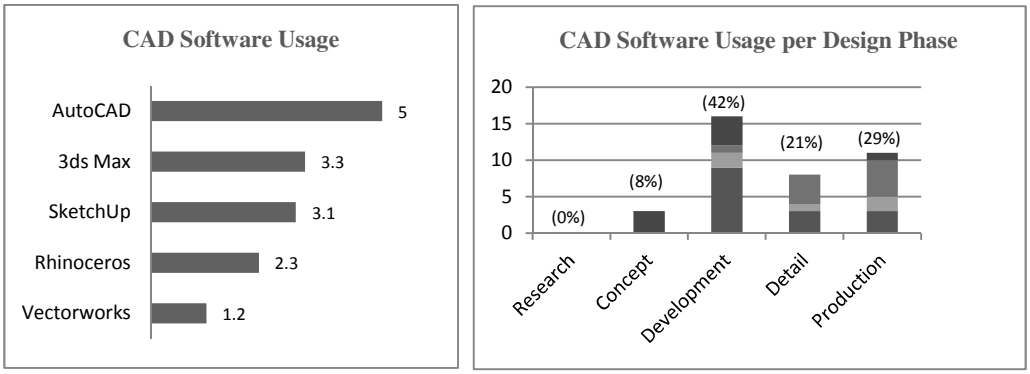


Fig. 7.32 Statistics of A3, A4

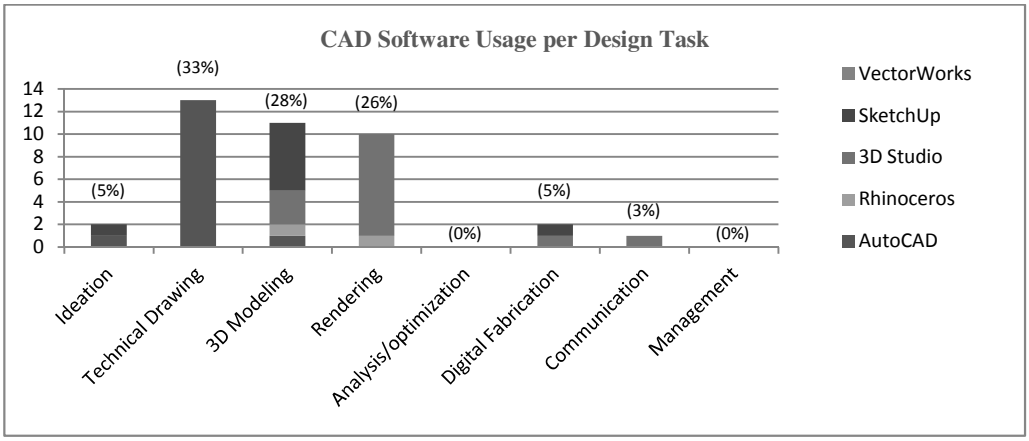


Fig. 7.33 Statistics of A5

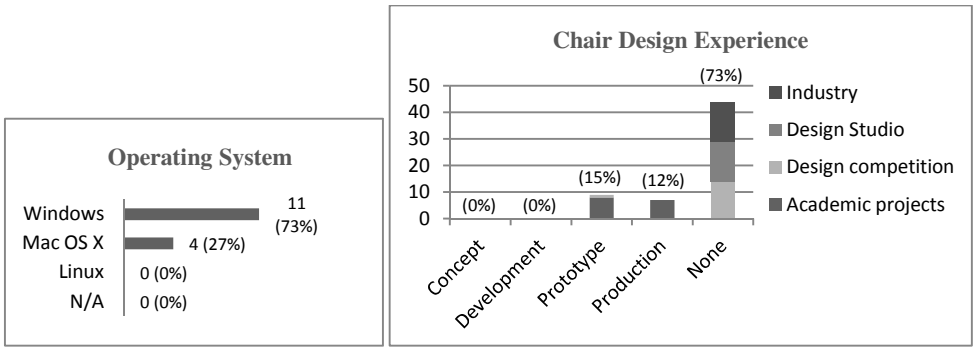


Fig. 7.34 Statistics of A6, A7

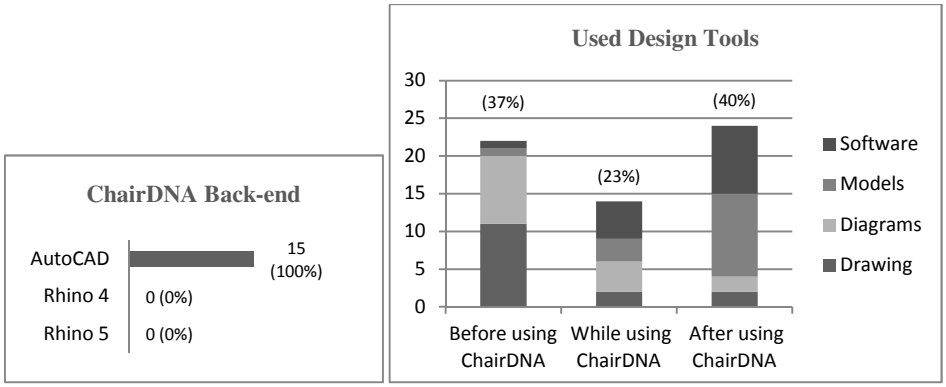


Fig. 7.35 Statistics of B1, B2

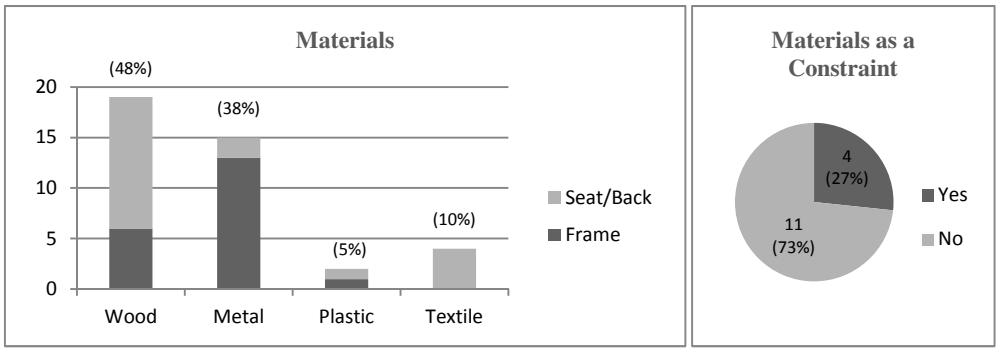


Fig. 7.36 Statistics of B3[C], B4

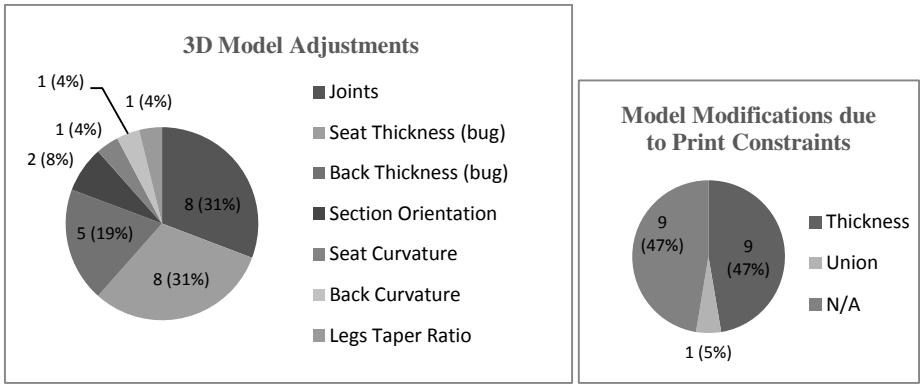


Fig. 7.37 Statistics of B5[C], B6[N/A], B7[C]

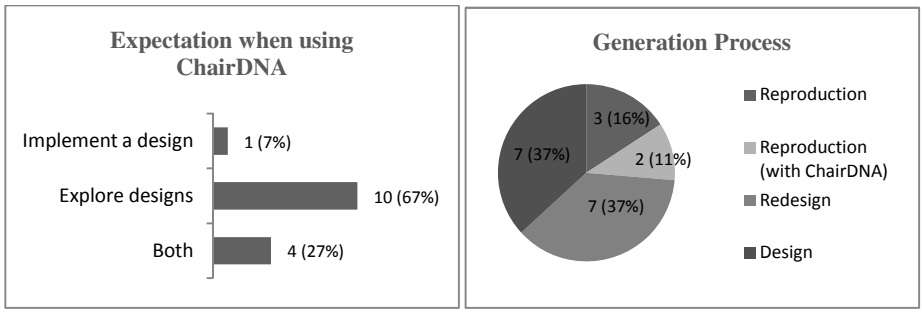


Fig. 7.38 Statistics of B8, B9

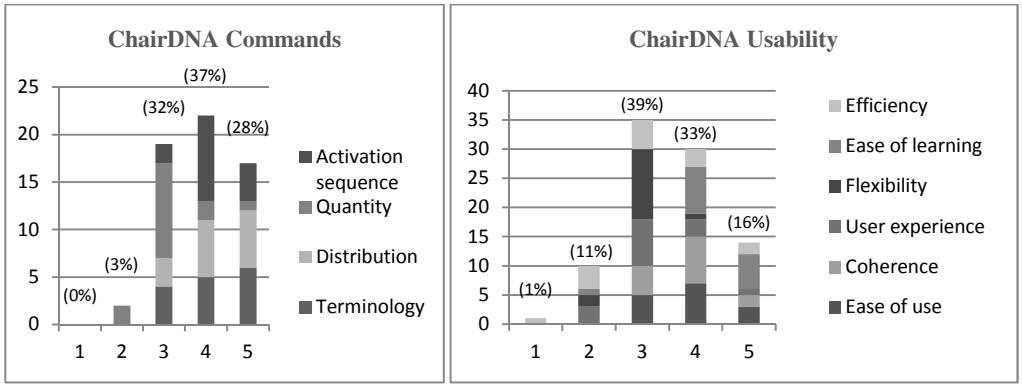


Fig. 7.39 Statistics of C1-C4, C5-C10

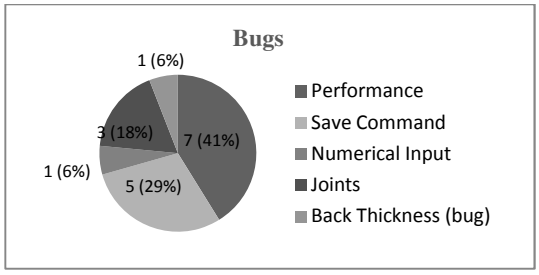


Fig. 7.40 Statistics of C11

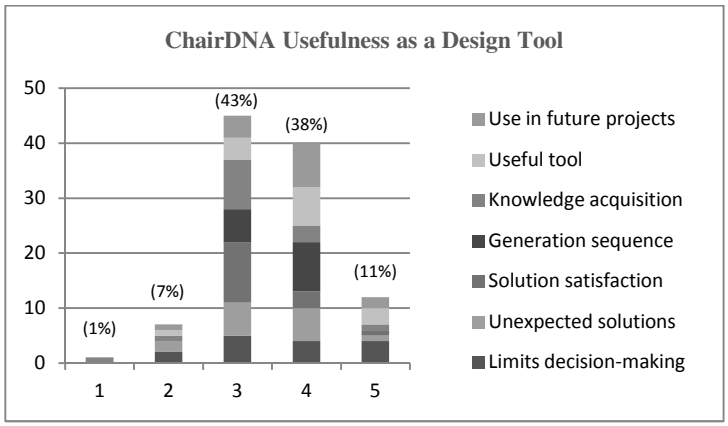


Fig. 7.41 Statistics of D1-D6 & D9

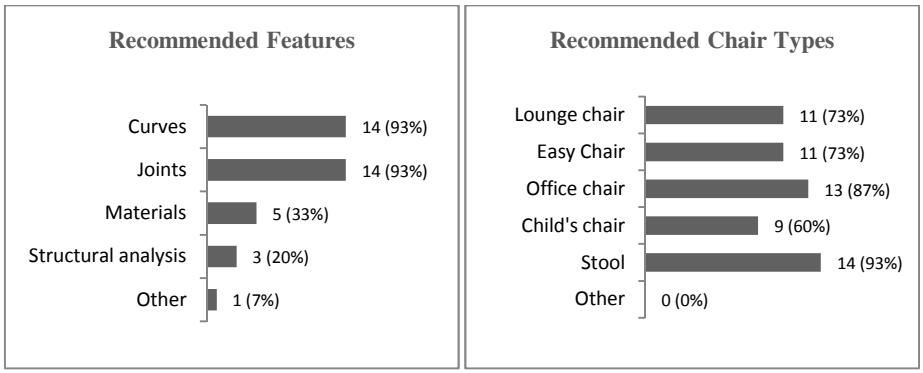


Fig. 7.42 Statistics of D7, D8

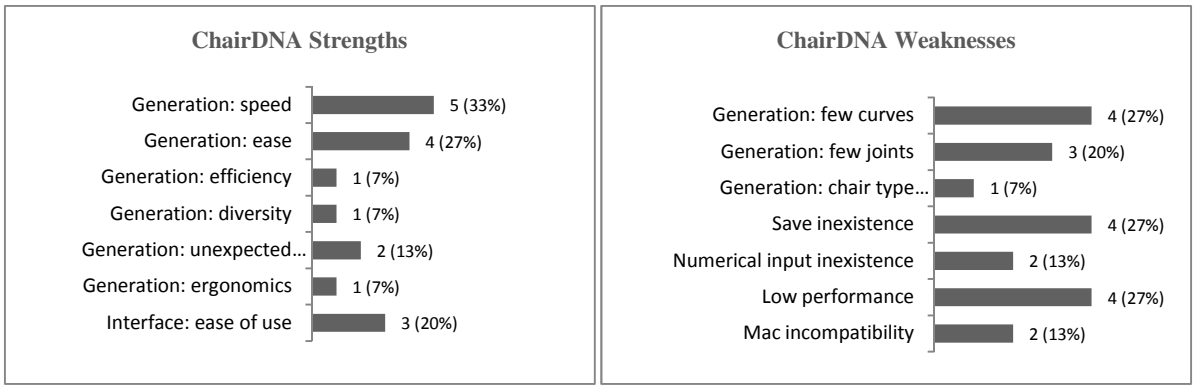


Fig. 7.43 Statistics of D10, D11

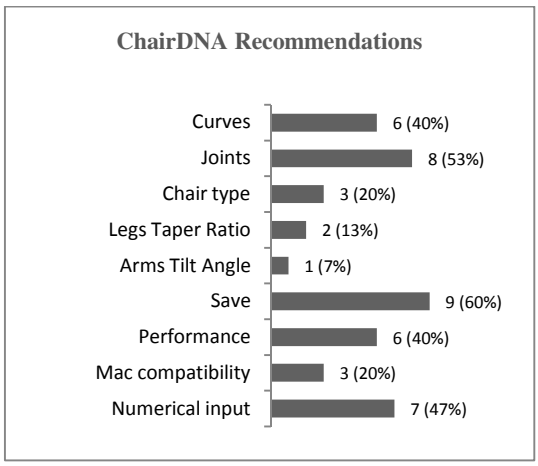


Fig. 7.44 Statistics of D12[C]

Appendix 7.B Second Evaluation

Appendix 7.B.1 Pre-test Interview Script

ID: Participant: _____, Location: _____, Date: __/__/__, Hour: _____

***Title*:** ChairDNA usage in the Concept Phase of the Chair Design Process: Pre-test Interview

***Welcome message*:** In this first phase, we will fill a questionnaire that addresses your experience as a chair designer.

A	**Participant Profile (Demographic Profile)**
A1	* Name
A2	* Age *Only numbers may be entered in this field*
A3	* Gender ❍ Female ❍ Male
A4	Indicate your education in the field of Design, specifying for each academic degree the name of the course and its educational institution. *Please fill at least one answer* Graduation / Master / PhD / Other / Other — Course / Educational institution
A5	* Indicate your current professional position. *Choose one of the following answers* ❍ Freelance Designer ❍ Studio Designer ❍ Industry Designer ❍ Agency Designer ❍ Other:
A6	* Indicate the number of years of professional Design experience. *Choose one of the following answers* ❍ Less than 3 years ❍ From 3 to 5 years ❍ More than 5 years
A7	* In general, what are your guiding principles, which define your identity as a designer?

A	Participant Profile (Experience in 3D CAD applications)
A8	* What 3D computer graphics software(s) do you use in the design process? *Check any that apply* ❒ AutoCAD ❒ Rhinoceros ❒ 3D Studio Max ❒ SketchUp ❒ SolidWorks ❒ N/A ❒ Other:
A9	* Rank the software(s) by order of importance in your design process. *Double-click or drag-and-drop items in the left list to move them to the right - your highest ranking item should be on the top right, moving through to your lowest ranking item.* Your choices: [A8 Answer] [A8 Answer] [A8 Answer] [A8 Answer] [A8 Answer] [A8 Answer] Your ranking
A10	* At what design phase(s) do you use each of the software?

	Research	Concept	Development	Detail	Production
[A8 Answer]	❒	❒	❒	❒	❒
[A8 Answer]	❒	❒	❒	❒	❒
[A8 Answer]	❒	❒	❒	❒	❒
[A8 Answer]	❒	❒	❒	❒	❒
[A8 Answer]	❒	❒	❒	❒	❒
[A8 Answer]	❒	❒	❒	❒	❒

A11 * At what design task(s) do you use each of the software?

	Ideation	Technical Drawing	3D Modelling	Rendering	Analysis/ Optimization	Digital Fabrication	Commu-nication	Management	Other
[A8]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[A8]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[A8]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[A8]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[A8]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[A8]	❒	❒	❒	❒	❒	❒	❒	❒	❒

A12	* Which operating system do you usually use in your design process? *Choose one of the following answers*

	❍ Windows ❍ Mac OS X ❍ Linux ❍ Other:

A	**Participant Profile (Experience in Chair Design)**
A13	* For each of the contexts listed below, what phase do you reached in chair design process?

	Concept	Development	Detail	Production	N/A
Academic projects	❍	❍	❍	❍	❍
Design competition	❍	❍	❍	❍	❍
Design Studio	❍	❍	❍	❍	❍
Industry	❍	❍	❍	❍	❍
Agency	❍	❍	❍	❍	❍

A14	If you answered 'Production', indicate the number of units produced. *Choose one of the following answers* ❍ 1 ❍ 2-10 ❍ 11-100 ❍ 101-100.000 ❍ More than 100.000

PA	**Chair Design: Characterization of the Product**
PA1	* Product name
PA2	* Design date (year) *Only numbers may be entered in this field*
PA3	* Product state *Choose one of the following answers* ❍ Concept ❍ Development ❍ Detail ❍ Production ❍ Commercialization ❍ Discontinued ❍ Other:
PA4	* Client
PA5	* Designer's professional position along the project *Choose one of the following answers*

	○ Freelance Designer ○ Studio Designer ○ Industry Designer ○ Agency Designer ○ Other:
PA6	Collaborators (if applicable)
PA7	Production details (if applicable) Manufacturer Production date (year) Number of units produced (1, 2-10, 11-100, 101-100.000, more than 100.000)
PA8	Commercialization details (if applicable) Seller company Average selling price (€)
PA9	Materials *Please fill at least one answer* Frame Seat/Back Other
PA10	Manufacturing processes *Please fill at least one answer* Frame Seat/Back Other
PA11	* Product options/variants *Check any that apply.* ❒ Colour ❒ Material ❒ Finish ❒ N/A ❒ Other:
PA12	* Product family *Check any that apply.* ❒ Chair (other parts) ❒ Stool/Bench ❒ Lounge Chair ❒ Children's Chair ❒ Table ❒ N/A ❒ Other:

PB	Chair Design: Characterization of the Design Process – Concept Phase
PB1	* What were the restrictions imposed by the design brief? *Check any that apply* ❒ Assembly ❒ Cost ❒ Ergonomics ❒ Aesthetics ❒ Function ❒ Materials ❒ Production ❒ Symbology ❒ Sustainability ❒ User ❒ Other:
PB2	* Which stakeholders, besides the designer, intervened with restrictions or suggestions in the concept phase? *Check any that apply.* ❒ Client ❒ Manufacturer ❒ Seller ❒ User ❒ N/A ❒ Other:
PB3	* What were the goals (or principles) that guided you in generation of the concept?
PB4	* What type of information did you research to support the concept phase? *Check any that apply* ❒ Assembly ❒ Cost ❒ Ergonomics ❒ Aesthetics ❒ Function ❒ Materials ❒ Production ❒ Symbology ❒ Sustainability ❒ User ❒ Other:
PB5	* What are the main gaps in the researched information?

PB6	* What tools (or methods) did you use in the concept phase? *Check any that apply.* ❒ Drawing ❒ Diagrams ❒ Models ❒ CAD Software ❒ Brainstorming ❒ Other:
PB7	* What 3D CAD computer graphics software did you use in the concept phase? *Check any that apply* ❒ AutoCAD ❒ Rhinoceros ❒ 3D Studio Max ❒ SketchUp ❒ SolidWorks ❒ N/A ❒ Other:
PB8	At what design task(s) did you use each of the software?

	Ideation	Technical Drawing	3D Modelling	Rendering	Analysis/ Optimization	Digital Fabrication	Commu-nication	Management	Other
[PB7]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[PB7]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[PB7]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[PB7]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[PB7]	❒	❒	❒	❒	❒	❒	❒	❒	❒
[PB7]	❒	❒	❒	❒	❒	❒	❒	❒	❒

PB	**Chair Design: Characterization of the Design Process – Concept Phase (Form Generation Process)**
PB9	* Describe in general the process of form generation.
PB10	* How would you classify your process of form generation? *Check any that apply.* ❒ Analytical ❒ Exploratory ❒ Analogical ❒ Other:

PB11	* What were your inspirations or influences?
PB12	* Describe the main strategy used in the process of form generation. *Choose one of the following answers* Please enter your comment here: ❍ From the specific to the general ❍ From the general to the specific ❍ Mix
PB13	* Did you use any grid or guides as a reference for form generation? ❍ Yes ❍ No
PB14	* Describe the environment used during the process of form generation. *Choose one of the following answers* Please enter your comment here: ❍ Mainly Physical ❍ Mainly Digital ❍ Physical to Digital ❍ Digital to Physical ❍ Mix
PB15	* Indicate the number of alternatives generated in the concept phase. *Choose one of the following answers* Please enter your comment here: ❍ One ❍ Several ❍ From several to one ❍ From one to several ❍ Mix
PB16	Rank the parts of the chair by order of generation (optional). *Double-click or drag-and-drop items in the left list to move them to the right - your highest ranking item should be on the top right, moving through to your lowest ranking item.* Your choices / Your ranking Seat Back Legs Arms Base Stretchers Other
PB17	* What main difficulties did you encountered in the concept phase? *Check any that apply* ❒ Information acquisition ❒ Information management

	❒ Time management ❒ Communication with stakeholders ❒ Creative blockage ❒ Generation of alternatives ❒ Selection of alternatives ❒ Other:

E	**Expectations about a tool for the generation of the form of chairs**
E1	* To what extent do digital tools contribute, or could contribute, to the concept phase of the design process?
E2	* What features would be useful in a digital tool to aid the chair generation process?
E3	* On a scale of 1 to 5, how do you prospect the usefulness of such a tool (being 1 slightly useful and 5 very useful)? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5

End message: Thanks for your collaboration.

***Mandatory questions**

Appendix 7.B.2 User Test Script

ID: Participant: _____, Location: _____, Date: __/__/__, Hour: _____

This second stage of the experiment aims to evaluate the usability and usefulness of the ChairDNA prototype in the design of multipurpose chairs. As such, I will give you 4 tasks to accomplish with ChairDNA.

Remember that we testing the program, not you. ChairDNA is in the prototype phase, therefore some failures may occur. Your contribution is very important to improve this prototype.

Feel comfortable to express your impressions, whether they are positive or negative, and to ask me questions. While performing the tasks you can share with me what you are thinking, and express your opinions: whether or not it matches your expectations, what surprises you, what you appreciate, what confuses you or causes frustration, and why. Feel free to take the time you need to accomplish the tasks.

Quick Start Tutorial

Before starting the tasks, I would like you to view the ChairDNA video tutorial.

Task 1: Free exploration

Subtasks	Description of Errors, Helps, Comments, and Actions
Freely explore the features of ChairDNA (maximum 10 min)	
Save the file	
Rate the ease of performing this task on a scale of 1 to 5 (being: 1 – very difficult and 5 – very easy)	1 2 3 4 5

Task 2: Reproduce an existing chair (from a figure)

Subtasks	Description of Errors, Helps, Comments, and Actions
Reproduce the ***Thonet 214*** chair depicted in Figure 1, up to the level of detail that the program allows	
Save the file	
Rate the ease of performing this task on a scale of 1 to 5 (being: 1 – very difficult and 5 – very easy)	1 2 3 4 5

Task 3: Edit an existing chair (from verbal description)

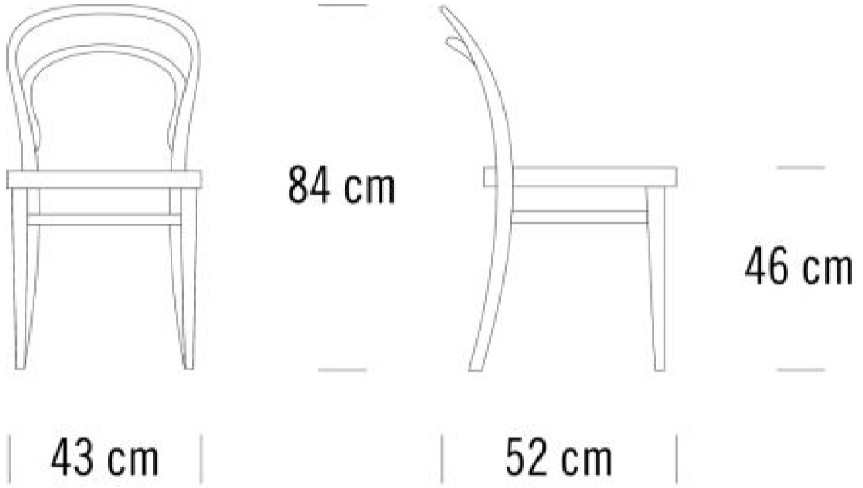
Subtasks	Description of Errors, Helps, Comments, and Actions
Open a new file	
Upload the template of the Gonçalo chair, also known as *Cadeira Portuguesa*	
Change the number of legs to three (with one leg in the front and two legs in the back)	
Add one 'Seat Front Rail' and four 'Seat Cross Rails'	
Remove the armrest	
Place a base with a radial shape	
Save the file with a different name	
Rate the ease of performing this task on a scale of 1 to 5 (being: 1 – very difficult and 5 – very easy)	1 2 3 4 5

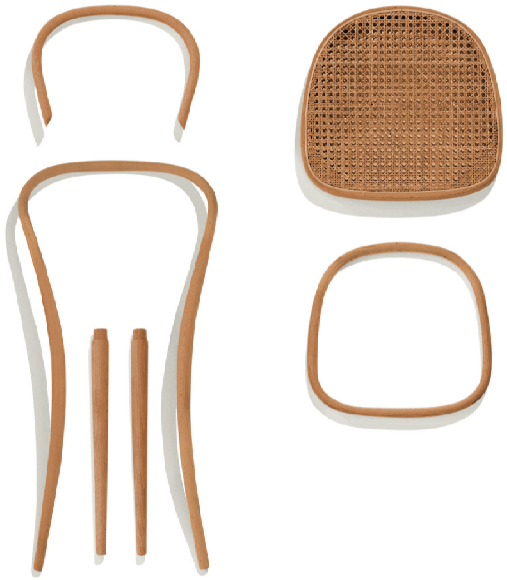
Task 4: Design a chair

Subtasks	Description of Errors, Helps, Comments, and Actions
Develop an original concept of a multipurpose adult chair, with the aid of ChairDNA; You can use the tools you want in the process (e.g. drawing, models, CAD software); You can use as inspiration the chair discussed in the previous stage; You can edit a chair from the template library or a randomly generated chair; The final solution must be delivered in a 3D digital model.	
Save the file	
Rate the ease of performing this task on a scale of 1 to 5 (being: 1 – very difficult and 5 – very easy)	1 2 3 4 5

Figure 1

Name	**214**
Designer	Michael Thonet
Manufacturer	Thonet GmbH
Date (design)	1859
Materials	Beech Wood, Woven Cane
Dimensions (mm)	430 W, 520 D, 840 H, 460 SH





Appendix 7.B.3 Post-test Questionnaire Script

ID: Participant: _____, Location: _____, Date: __/__/__, Hour: _____

Title: ChairDNA usage in the Concept Phase of the Chair Design Process: Post-test questionnaire

***Welcome message*:** The present questionnaire is part of a study on the ChairDNA usage in the concept phase of the chair design process. The questions relate to the tasks you previously performed with the ChairDNA.

B	**Description of the task where you developed a chair design using ChairDNA**
B1	* Describe in general the process of generation of the form of the chair.
B2	* How would you classify your form generation process? *Check any that apply.* ❒ Analytical ❒ Exploratory ❒ Analogical ❒ Other:
B3	* What were your inspirations or influences?
B4	* What were the goals (or principles) that guided you in generation of the concept?
B5	* What tools did you use (besides ChairDNA), and at what phase of the process?

	Before using ChairDNA	While using ChairDNA	After Using ChairDNA	Unused
Drawing	❒	❒	❒	❒
Diagrams	❒	❒	❒	❒
Models	❒	❒	❒	❒
CAD Software	❒	❒	❒	❒

B6	What materials did you envision for the chair solution? *Please fill at least one answer*
	Frame
	Seat/Back
	Other
B7	* Did you consider the materials as a constraining factor during the process of form generation?

	❍ Yes ❍ No
B8	* After using ChairDNA, did you change the 3D model in some CAD software? If yes, indicate the changes made. *Choose one of the following answers* Please enter your comment here: ❍ Yes ❍ No
B9	** If you answered yes in the previous question, what CAD program did you use to make those changes? *Choose one of the following answers* ❍ AutoCAD ❍ Rhinoceros ❍ 3D Studio Max ❍ SketchUp ❍ SolidWorks ❍ Other:
B10	* What was your main expectation when using ChairDNA? *Choose one of the following answers* ❍ Implement a design ❍ Explore designs ❍ Both ❍ Other:

C	**ChairDNA usability** *Rate the answers on a scale of 1 to 5, being: 1- Strongly disagree and 5- Strongly agree.*
C1	* Are the commands names appropriate? Indicate suggestions (optional). *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C2	* Is the distribution of the commands through the windows adequate? Indicate suggestions (optional). *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C3	* Are the commands available in the program enough? Specify commands that could be included. *Choose one of the following answers*

	Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C4	* Is the activation sequence of the commands adequate? Provide additional suggestions. *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C5	* Is the program easy to use? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C6	* Is the program coherent as a whole? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C7	* Was the usage experience good? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C8	* Does the program adapt to the user needs? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C9	* Was the program easy to learn? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C10	* The efficiency (response time) of the program is good? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C11	* How difficult was it to find out the correct commands and procedures? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C12	* Is the use of Templates useful? Justify your answer. *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C13	* Is the random generation of designs (Random command) useful? Justify your answer. *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2

	❍ 3 ❍ 4 ❍ 5
C14	* Would it be useful to display icons corresponding to the commands? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C15	* Do you consider the name of the program (ChairDNA) appropriate? Indicate suggestions (optional). *Choose one of the following answers* Please enter your comment here: ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
C16	Indicate (if applicable) program malfunctions (bugs).

D	**ChairDNA usefulness as a design tool** *Rate the answers on a scale of 1 to 5, being: 1- Strongly disagree and 5- Strongly agree.*
D1	* Does the program limit decision making? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D2	* Did the program allow the emergence of solutions that you had not initially thought of? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D3	* Are you satisfied with the solution achieved with the aid of the program? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D4	* Do you consider that the logic of form generation provided by the program (addition of chair components) is appropriate to the concept phase of the chair design process? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D5	* Do you consider that the program provided you with new knowledge on the form and structure of the chairs? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D6	* Do you consider that the program is a useful complement to the concept phase of the design process? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D7	* Has the program helped you to develop ideas? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D8	* Would you like to use the program in future design projects? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D9	* Would you like to purchase the program? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5

D10	* Would you recommend the program to other designers? ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D11	* What further features should be included in the program? *Check any that apply.* ❐ Curves ❐ Joints ❐ Materials ❐ Structural analysis ❐ N/A ❐ Other:
D12	* What further chair types should be included in the program? *Check any that apply.* ❐ Sun lounger ❐ Longue chair ❐ Office chair ❐ Children's Chair ❐ Stool/Bench ❐ N/A ❐ Other:
D13	* At what design phase(s) would you use the program? *Check any that apply.* ❐ Research ❐ Concept ❐ Development ❐ Detail ❐ Production ❐ N/A
D14	* What aspects of the program made it easier for you to design a chair?
D15	* What aspects of the program made it difficult for you to design a chair?
D16	* Indicate strengths of ChairDNA (mention at least one).
D17	* Indicate weaknesses of ChairDNA (please mention at least one).

D18	* Evaluate your overall satisfaction with ChairDNA. ❍ 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5
D19	Indicate additional suggestions/comments that you consider to be relevant for future program developments (optional answer).

End message: Thank you for your collaboration.

***Mandatory questions**
**** Only displayed if the previous one is 'Yes'**

Online questionnaire in LimeSurvey (version 2.05+).

Appendix 7.B.4 Participants List

ID	Name	Age	Employment type	Company	Town, District
PP	Patrícia Ferreira	30	Agency	Havas	Lisbon, Lisbon
P1	Toni Grilo	37	Design Studio	Toni Grilo	Matosinhos, Porto
P2	André Pinto	31	Industry	Adico	Avanca, Aveiro
P3	Paulo Neves	36	Design Studio	gud	Porto, Porto
P4	José Viana	56	Teacher	FBAUL	Lisbon, Lisbon
P5	Luís Ribeiro	29	Tech Company	Ynvisible	Lisbon, Lisbon
P6	Joana M. Carvalho	26	Agency	Leo Burnett	Lisbon, Lisbon
P7	Nuno Ladeiro	48	Design Studio	Nuno Ladeiro A+D	Lisbon, Lisbon
P8	Raul Cunca	53	Teacher	FBAUL	Lisbon, Lisbon
P9	Gonçalo Prudêncio	40	Design Studio	GPOD	Sintra, Lisbon
P10	Mariana Costa e Silva	36	Freelancer	N/A	Leiria, Leiria

Appendix 7.B.5 Consent Forms

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Patrícia Ferreira, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 24/01/2017

Patrícia Ferreira

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 24/01/2017

Sara Garcia

(assinatura da investigadora)

Fig. 7.45 Consent form of PP (pilot test)

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, TONI GRIZO, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 26/01/2017

(assinatura do próprio)

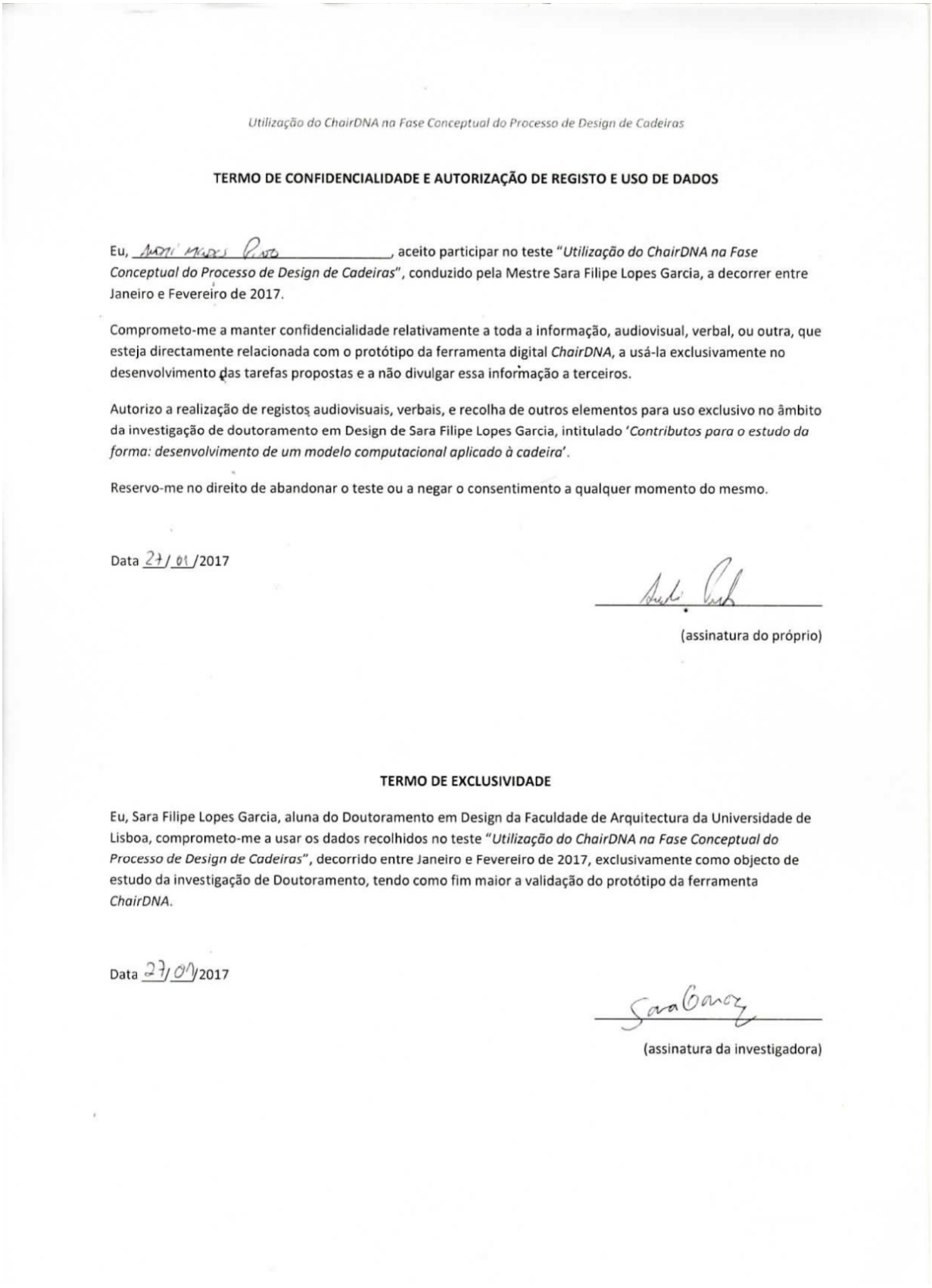
TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 26/01/2017

(assinatura da investigadora)

Fig. 7.46 Consent form of P1



Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, _____, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 27/01/2017

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 27/01/2017

(assinatura da investigadora)

Fig. 7.47 Consent form of P2

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Paulo Neves, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 30/01/2017

P. Neves

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 30/1/2017

(assinatura da investigadora)

Fig. 7.48 Consent form of P3

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, José Vieira, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 2 / 2 /2017

(assinatura do próprio)

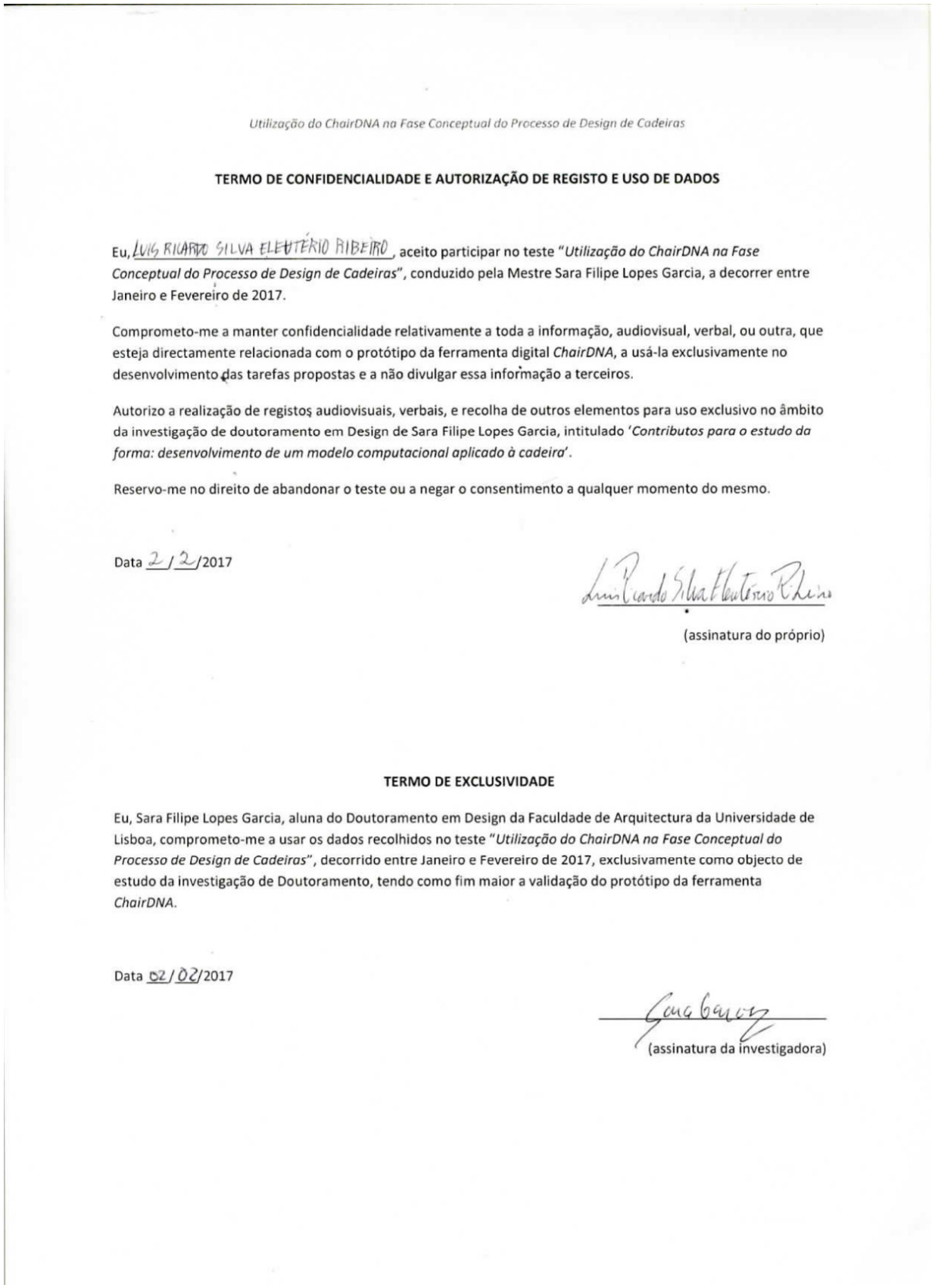
TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 02 / 02 /2017

(assinatura da investigadora)

Fig. 7.49 Consent form of P4



Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, LUIS RICARDO SILVA ELEUTÉRIO RIBEIRO, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 2 / 2 /2017

Luis Ricardo Silva Eleutério Ribeiro

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 02 / 02 /2017

(assinatura da investigadora)

Fig. 7.50 Consent form of P5

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, JOANA MOREIRA DE CARVALHO, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 8/2/2017

Joana Moreira de Carvalho

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 8/2/2017

Sara Garcia

(assinatura da investigadora)

Fig. 7.51 Consent form of P6

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, _____, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 9/2/2017

_____

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 9/2/2017

_____

(assinatura da investigadora)

Fig. 7.52 Consent form of P7

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, RAUL LUNA, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 15/02/2017

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data ___/___/2017

(assinatura da investigadora)

Fig. 7.53 Consent form of P8

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, [illegible], aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 15/02/2017

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 15/02/2017

(assinatura da investigadora)

Fig. 7.54 Consent form of P9

Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras

TERMO DE CONFIDENCIALIDADE E AUTORIZAÇÃO DE REGISTO E USO DE DADOS

Eu, Mariana Costa e Silva, aceito participar no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", conduzido pela Mestre Sara Filipe Lopes Garcia, a decorrer entre Janeiro e Fevereiro de 2017.

Comprometo-me a manter confidencialidade relativamente a toda a informação, audiovisual, verbal, ou outra, que esteja directamente relacionada com o protótipo da ferramenta digital *ChairDNA*, a usá-la exclusivamente no desenvolvimento das tarefas propostas e a não divulgar essa informação a terceiros.

Autorizo a realização de registos audiovisuais, verbais, e recolha de outros elementos para uso exclusivo no âmbito da investigação de doutoramento em Design de Sara Filipe Lopes Garcia, intitulado '*Contributos para o estudo da forma: desenvolvimento de um modelo computacional aplicado à cadeira*'.

Reservo-me no direito de abandonar o teste ou a negar o consentimento a qualquer momento do mesmo.

Data 16/2/2017

(assinatura do próprio)

TERMO DE EXCLUSIVIDADE

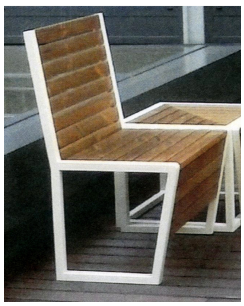
Eu, Sara Filipe Lopes Garcia, aluna do Doutoramento em Design da Faculdade de Arquitectura da Universidade de Lisboa, comprometo-me a usar os dados recolhidos no teste "*Utilização do ChairDNA na Fase Conceptual do Processo de Design de Cadeiras*", decorrido entre Janeiro e Fevereiro de 2017, exclusivamente como objecto de estudo da investigação de Doutoramento, tendo como fim maior a validação do protótipo da ferramenta *ChairDNA*.

Data 16/2/2017

(assinatura da investigadora)

Fig. 7.55 Consent form of P10

Appendix 7.B.6 Analysed Chairs



ID	**PP**
Name	Mobiliário de exterior para Jogos Santa Casa
Design	Patrícia Ferreira, 2016
Production	Steersman, 2016
Commercialization	N/A
Client	Jogos Santa Casa
Materials	Tubular steel, Wood
Techniques	Cutting
Dimensions (mm)	W.650 x D.573 x H.928 x SH.450
Source	N/A
Image source	Courtesy of the designer

ID	**P1**
Name	Cut
Design	Toni Grilo, 2015
Production	Sofalca, 2015-
Commercialization	Blackcork, 300€
Client	Blackcork
Materials	Black cork, Oak wood
Techniques	Cutting
Dimensions (mm)	W.460 x D.450 x H.730 x SH.450
Source	(Parra, 2011)
Image source	http://www.tonigrilo.com

ID	**P2**
Name	Alba
Design	André Pinto (Adico), 2009
Production	Adico, 2009-2016
Commercialization	Adico
Client	Adico
Materials	Mild steel, beech plywood
Techniques	Bending, moulding
Dimensions (mm)	W.438 x D.496 x H.818 x SH.UNK
Source	(Experimentadesign, 2011)
Image source	http://www.adico.pt

ID	**P3**
Name	Orca
Design	Paulo Neves & Alexandre Kumagai (Studio gud), 2012
Production	Wewood & Móveis Carlos Alfredo, 2012-
Commercialization	Wewood, 800€
Client	Wewood
Materials	Oak/Walnut wood
Techniques	CNC Milling
Dimensions (mm)	W.450 x D.540 x H.770 x SH.UNK
Source	(Branco, 2012)
Image source	http://www.wewood.eu

ID	**P4**
Name	D&D
Design	José Viana, 2004
Production	Forthcoming
Commercialization	N/A
Client	N/A
Materials	Poplar plywood
Techniques	Cutting
Dimensions (mm)	W.370 x D.370 x H.870 x SH.UNK
Source	(Coutinho, 2015)
Image source	(Coutinho, 2015)

ID	**P5**
Name	Walking chair
Design	Luís Ribeiro, 2012
Production	Agostinho Figueiredo e Filho, Lda., 2012-
Commercialization	Luis Ribeiro Design, 290€
Client	Art on Chairs International Design Competition
Materials	Beech wood
Techniques	Cutting
Dimensions (mm)	W.400 x D.400 x H.850 x SH.455
Source	(Praquin, 2013)
Image source	http://luisribeiro87.wixsite.com/design

ID	**P6**
Name	Buton
Design	Joana M. Carvalho, 2012
Production	Margem Ideal, Comercio e Indústria de Mobiliário, Lda., 2012-UNK
Commercialization	Temporary Brand (in: Embaixada Gallery), 250€
Client	Art on Chairs International Design Competition
Materials	Pine wood, Burel wool fabric
Techniques	Cutting, Sewing
Dimensions (mm)	W.440 x D.505 x H.750 x SH.435
Source	(Branco, 2012)
Image source	http://joanamcarvalho.com

ID	**P7**
Name	Redesign da Cadeira Portuguesa
Design	Nuno Ladeiro, 2015
Production	Maspi, 2017
Commercialization	Colico, 99€
Client	Colico
Materials	Polypropylene
Techniques	Restylon Air Moulding
Dimensions (mm)	W.526 x D.577 x H.809 x SH.420
Source	(Centro Português de Design, 2003)
Image source	http://www.nunoladeiro.com

ID	**P8**
Name	Columba
Design	Raul Cunca, 2017
Production	Forthcoming
Commercialization	N/A
Client	Cunca Concept Design
Materials	Beech wood, lacquered steel, Burel wool fabric
Techniques	Cutting, Sewing
Dimensions (mm)	W.570 x D.540 x H.812 x SH.UNK
Source	(Parra, 2011)
Image source	http://www.raulcunca.com

ID	**P9**
Name	Tubo
Design	Gonçalo Prudêncio, 2010
Production	Arcalo & Marcenaria Avelino & Castro, 2010-
Commercialization	Ghome, 90€
Client	Ghome
Materials	Lacquered steel, cork agglomerate
Techniques	Bending, CNC Milling
Dimensions (mm)	W.528 x D.460 x H.743 x SH.450
Source	(Coutinho, 2015)
Image source	http://www.ghome.pt

ID	**P10**
Name	CUT armchair
Design	Mariana Costa e Silva, 2007
Production	Millplan, 2011-
Commercialization	CUT Furniture, 260€
Client	CUT Furniture
Materials	Valchromat
Techniques	CNC Milling
Dimensions (mm)	W.680 x D.670 x H.720 x SH.UNK
Source	(Coutinho, 2015)
Image source	http://cutfurniture.com

Appendix 7.B.7 Resulting Designs

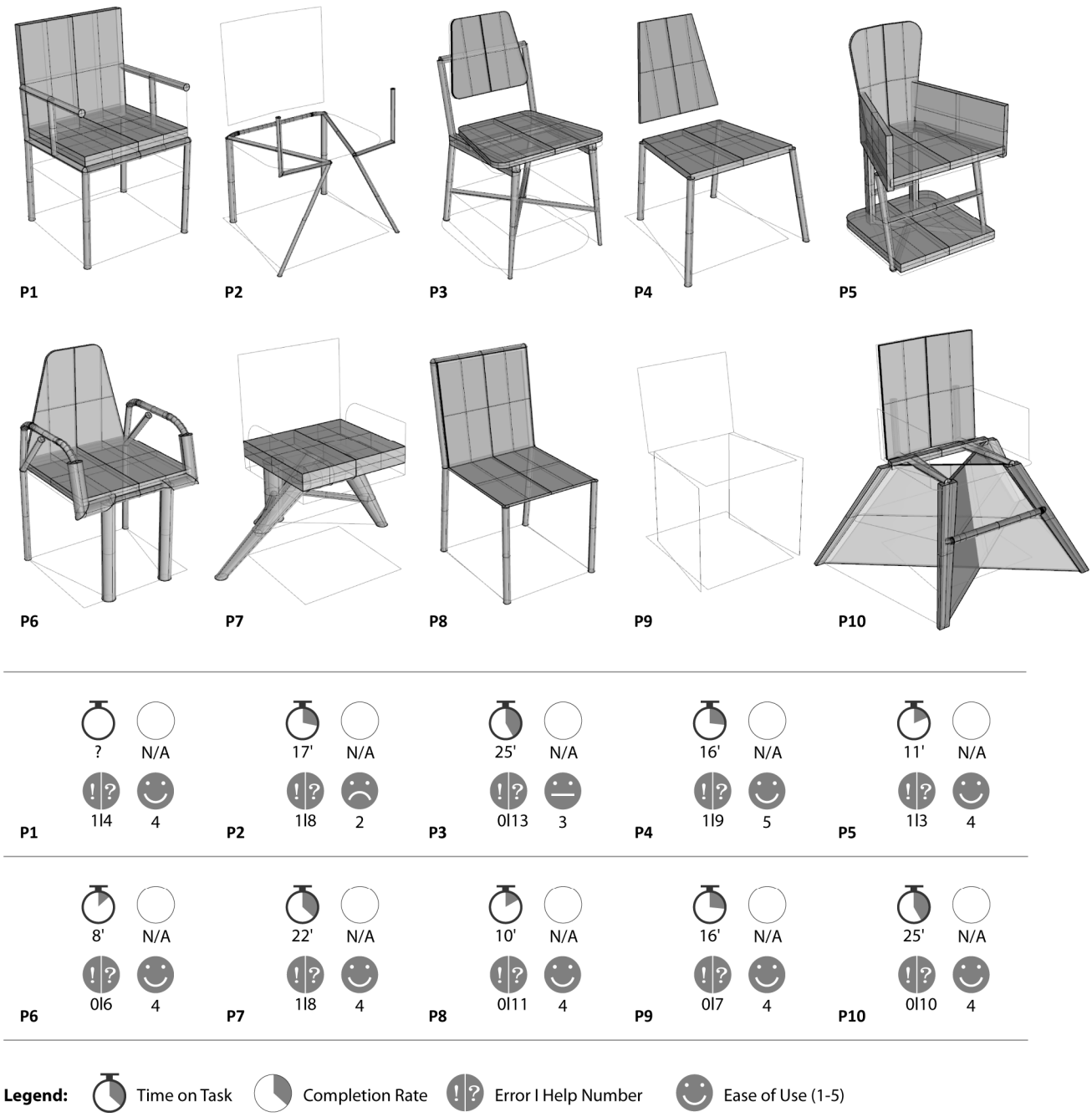


Fig. 7.56 Results of Task 1

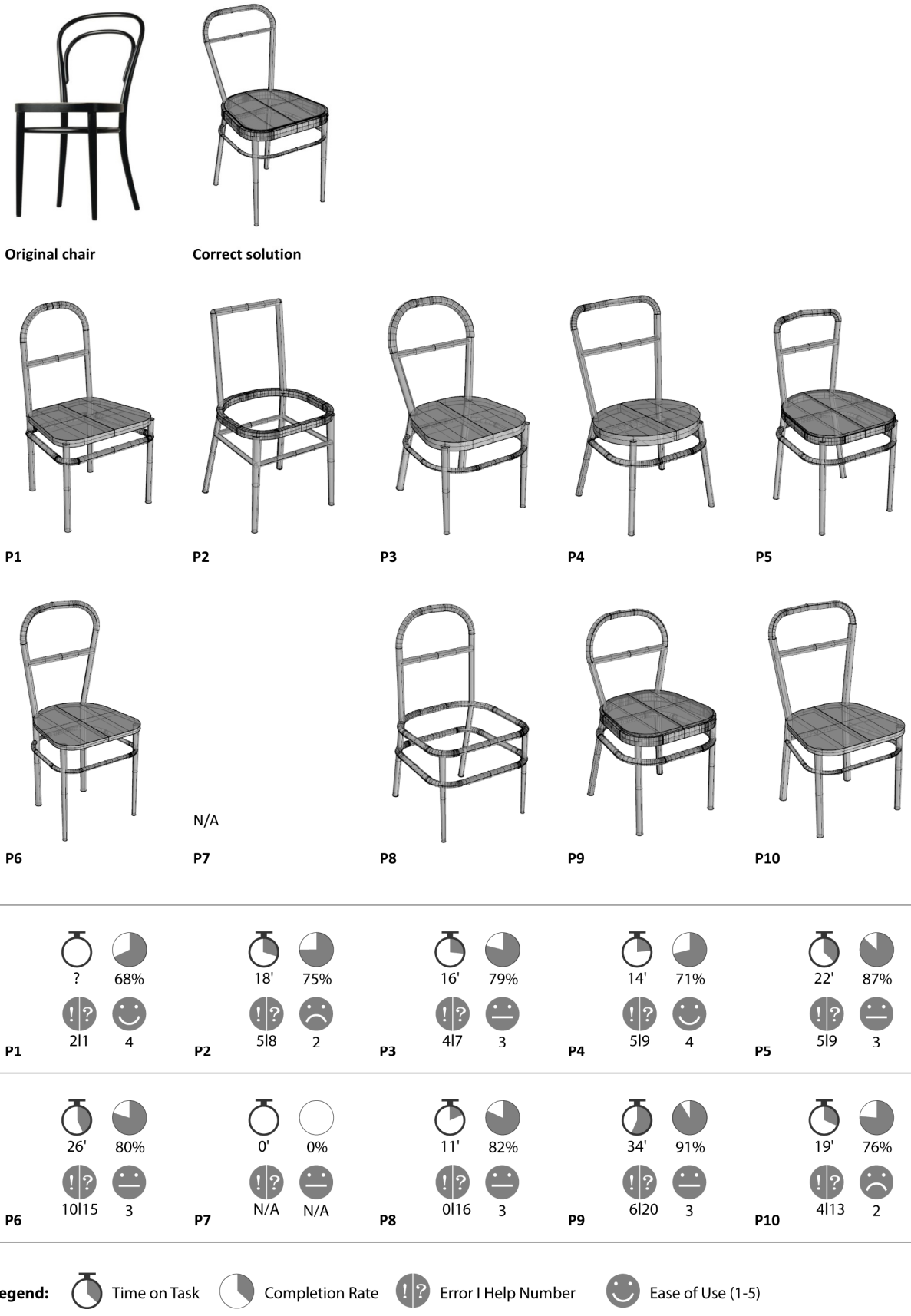


Fig. 7.57 Results of Task 2

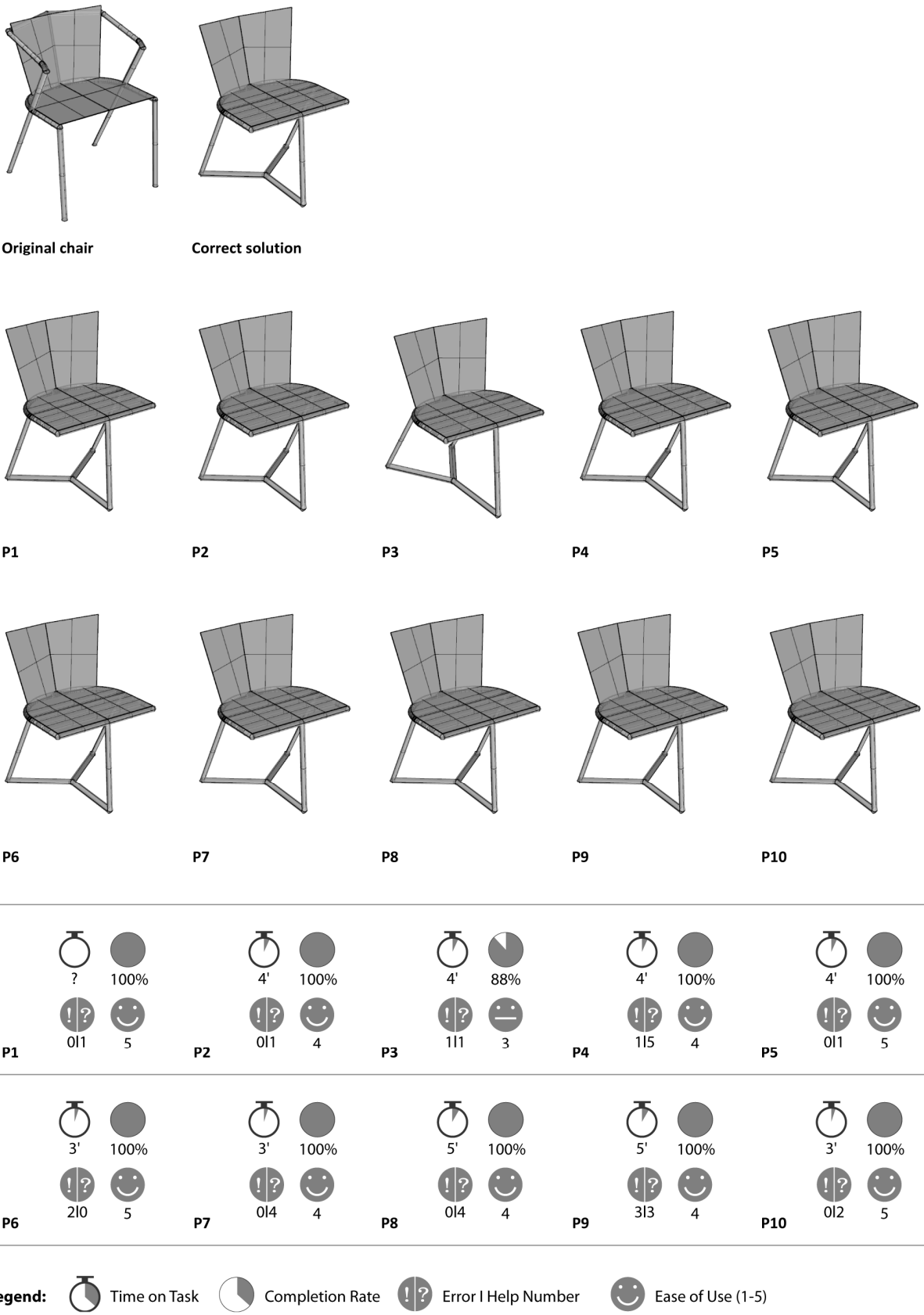


Fig. 7.58 Results of Task 3

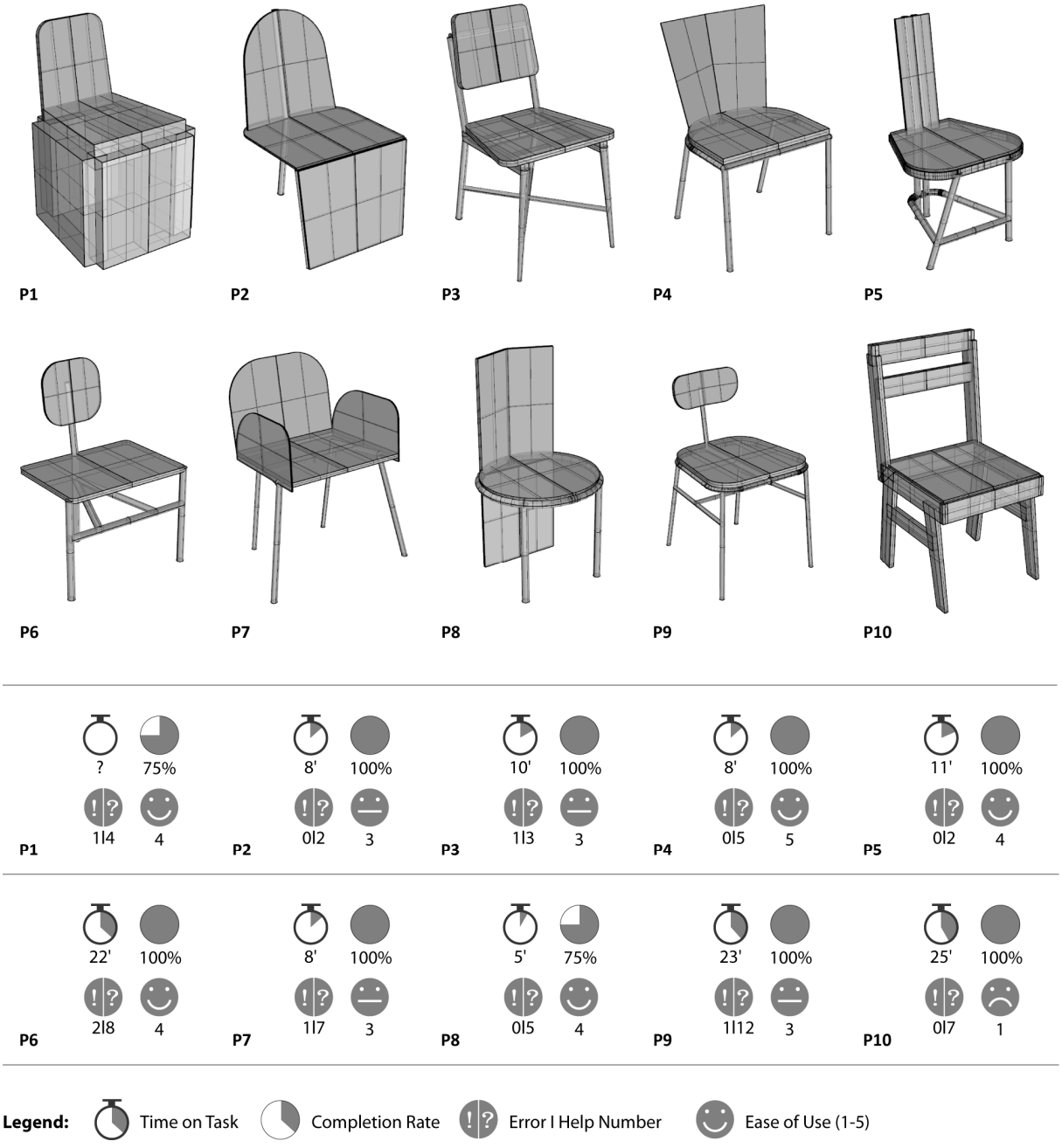


Fig. 7.59 Results of Task 4

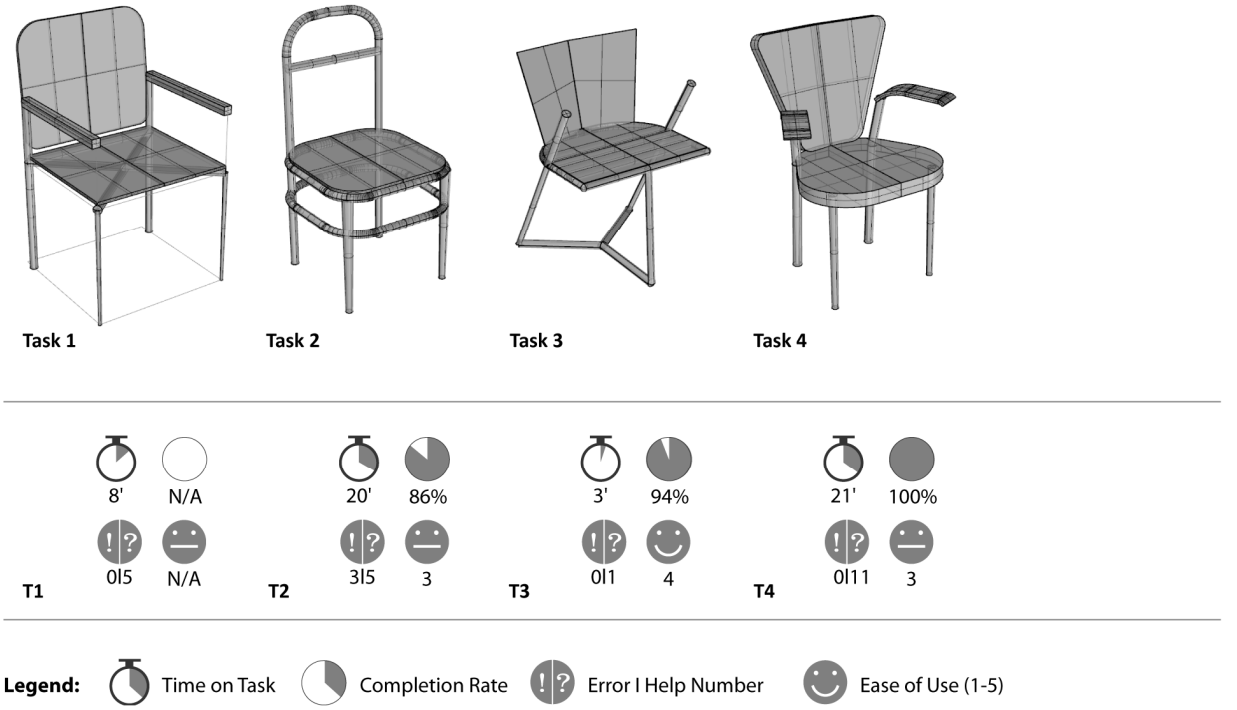


Fig. 7.60 Results of the pilot test

Appendix 7.B.8 Completion Rate Calculation

Task 2

Method for the calculation of the Completion Rate:

1) N/A: Guides and incorrect parameters (Back Legs Taper Ratio and Back Outer Diameter);
2) For checkboxes:
    a. If the correct value is different from the default value and the participant value is different from the default value (i.e., the participant correctly changes a value), the score is 1;
    b. If the participant value is equal to the default value (i.e., the participant correctly does not change a value), the score is 0;
    c. Otherwise (i.e., if the participant wrongly changes a value) the score is -1 (if the value influences the design) or ERROR (if the value does not influence the design);
3) For sliders:
    a. If the correct value is different from the default value, the score is calculated by the relative error (i.e., the accuracy level), illustrated in **Fig. 7.61** (shown below), giving a result between 0 and 1;
    b. If the participant value is equal to the default value (i.e., the participant correctly does not change a value), the score is 0;
    c. Otherwise (i.e., of the participant wrongly changes a value) the score is calculated by the relative error, giving a value between -1 and 0 (if the value influences the design) or ERROR (if the value does not influence the design);
4) The completion rate is the percentage given by the sum of the score in relation to the total of correct values that are different from default (i.e., the values used by the correct design).

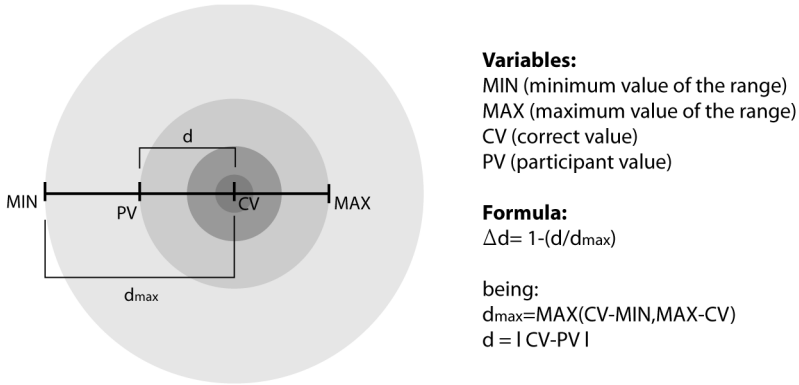


Fig. 7.61 Relative error calculation

Table 2 Completion Rate Calculation: Task 2

	PP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	MEAN	SD
Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mode	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Legs Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front Leg	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Width Spacing	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	N/A	0.00	0.00	-0.01	0.00	0.01
Depth Spacing	0.00	0.00	0.00	0.00	0.00	0.00	-0.08	N/A	0.00	-0.03	-0.10	-0.02	0.04
Splay Angle	0.00	0.00	-0.05	0.00	-0.11	0.00	0.00	N/A	0.00	0.00	0.00	-0.02	0.04
Rake Angle	0.00	0.00	0.00	0.00	-0.09	-0.04	0.00	N/A	0.00	0.00	0.00	-0.01	0.03
Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.97	0.99	0.97	0.98	0.99	0.99	0.99	N/A	0.99	0.99	0.99	0.99	0.01
Width	0.00	ERROR	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	ERROR	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Taper Ratio	0.97	0.33	0.87	0.86	0.33	0.54	0.91	N/A	0.96	0.33	0.59	0.64	0.27
Back Leg	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Width Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Splay Angle	0.93	0.93	0.96	0.99	0.93	0.90	0.93	N/A	0.93	0.93	1.00	0.94	0.03
Rake Angle	0.82	0.82	0.95	0.97	0.96	0.82	0.82	N/A	0.99	0.95	0.88	0.91	0.07
Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.98	0.98	0.98	0.95	0.98	0.98	0.98	N/A	0.98	0.98	0.96	0.97	0.01
Width	0.00	ERROR	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	ERROR	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Taper Ratio	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leg Front Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Leg Back Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Leg Side Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Leg Radial Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Thickness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Seat Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width	0.69	0.47	0.71	0.50	0.50	0.83	0.84	N/A	0.50	0.77	0.50	0.63	0.16
Depth	0.50	0.48	0.81	0.50	0.50	0.03	0.71	N/A	0.50	0.56	0.50	0.51	0.21
Height	0.85	0.86	0.61	0.85	0.85	0.61	0.61	N/A	0.85	0.68	0.85	0.75	0.12
Tilt Angle	0.00	-1.00	0.00	0.00	-0.80	0.00	0.00	N/A	0.00	0.00	0.00	-0.20	0.40
Front Radius	0.96	0.95	0.79	0.70	0.00	0.82	0.97	N/A	0.90	0.84	0.91	0.76	0.30
Rear Radius	0.68	0.45	0.99	0.88	0.88	0.87	0.90	N/A	0.84	0.92	0.81	0.84	0.15
Taper Width	0.85	0.92	0.85	0.99	0.85	0.96	0.96	N/A	0.85	0.96	0.99	0.93	0.06
Seat Front Rail	1	0	1	0	0	1	0	N/A	1	1	0	0.44	0.53
Seat Back Rail	1	0	1	0	0	1	0	N/A	1	1	0	0.44	0.53
Seat Side Rail	1	0	1	0	0	1	0	N/A	1	1	0	0.44	0.53
Outer Frame Section	0	0	1	0	0	1	0	N/A	0	1	0	0.33	0.50
Diameter	0.00	0.00	ERROR	0.00	0.00	ERROR	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width/Depth	0.99	0.99	0.99	0.99	0.99	0.93	0.99	N/A	0.99	0.99	0.99	0.98	0.02
Height	0.97	0.97	0.97	0.97	0.97	0.98	0.97	N/A	0.97	0.99	0.97	0.97	0.01
Seat Cross Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Depth Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Number	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Seat Long Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Width Front Spacing	0.00	0.00	ERROR	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width Rear Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Number	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00

Seat Radial Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Number	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Inner Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width/Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Seat Panel	1	1	0	1	1	1	1	N/A	0	1	1	0.78	0.44
Thickness	0.95	0.74	0.95	0.63	0.59	0.95	0.84	N/A	0.95	0.95	0.78	0.82	0.14
Back Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	0.66	0.66	0.74	0.66	0.62	1.00	0.66	N/A	0.66	1.00	0.66	0.74	0.15
Height Spacing	0.00	0.00	ERROR	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Back-Seat Angle	0.00	0.00	0.33	0.93	0.60	0.00	0.00	N/A	0.00	0.47	0.33	0.30	0.33
Top Radius	0.79	0.40	0.01	0.44	0.63	0.47	0.95	N/A	0.66	0.60	0.81	0.55	0.27
Bottom Radius	0.00	ERROR	ERROR	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width	0.00	0.00	-0.76	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	-0.08	0.25
Taper Width	0.68	0.68	0.44	0.92	0.85	0.85	1.00	N/A	0.68	0.95	0.93	0.81	0.18
Back Upright	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Height	0.00	0.00	-0.08	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	-0.01	0.03
Back Top Rail	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Back Bottom Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Outer Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width/Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Back Cross Rail	1	1	0	1	1	1	1	N/A	1	1	1	0.89	0.33
Height	0.89	0.69	0.50	0.96	0.73	0.73	0.73	N/A	0.81	1.00	0.81	0.77	0.15
Number	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Back Splat	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Width Top Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width Bottom Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Number	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Back Radial Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Inner Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.95	0.95	0.95	0.95	0.95	0.95	0.95	N/A	0.95	0.95	0.95	0.95	0.00
Width/Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Back Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Thickness	0.00	ERROR	0.00	0.00	ERROR	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Stretchers Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	0.90	0.96	0.91	0.97	0.99	0.98	0.97	N/A	0.86	0.98	0.98	0.96	0.04
Tilt Angle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Front Radius	0.93	0.45	0.06	0.78	0.78	0.93	0.76	N/A	0.70	0.93	0.84	0.69	0.28
Rear Radius	0.97	0.34	0.00	0.81	0.50	0.93	0.98	N/A	0.55	0.77	0.17	0.56	0.34
Front Stretcher	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Back Stretcher	1	1	1	1	1	1	1	N/A	1	1	1	1.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Side Stretcher	1	1.00	1	1	1	1	1.00	N/A	1	1	1	1.00	0.00
Outer Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.95	0.95	0.97	0.97	0.95	0.96	0.99	N/A	0.95	0.95	0.99	0.96	0.02
Width/Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Cross Stretcher	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Depth Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Long Stretcher	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00

Width Front Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width Rear Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Radial Stretcher	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Inner Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width/Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Stretchers Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Thickness	0.00	0.00	ERROR	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Base Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Width	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Front Radius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Rear Radius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Base Front Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Base Back Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Base Side Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Outer Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width/Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Base Cross Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Depth Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Base Long Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Width Front Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width Rear Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Base Radial Rail	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Number	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Inner Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width/Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Base Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Thickness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Arms Guides	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth Rear Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Tilt Angle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Front Radius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Rear Radius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Arm Front Support	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Arm Back Support	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Armrest	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Outer Frame Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth/Height	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Arm Side Support	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Depth Top Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth Bottom Spacing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Section	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Diameter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Width	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00

Arm Panel	0	0	0	0	0	0	0	N/A	0	0	0	0.00	0.00
Thickness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00	0.00
TOTAL	**32.82**	**25.96**	**28.44**	**30.13**	**26.92**	**32.96**	**30.30**	**0.00**	**31.00**	**34.41**	**29.07**	**26.92**	**9.80**
TOTAL (%)	**86.38**	**68.32**	**74.83**	**79.30**	**70.84**	**86.73**	**79.73**	**0.00**	**81.59**	**90.56**	**76.49**	**70.84**	**25.78**

Task 3

Method for the calculation of the Completion Rate:

1) If the subtask is accomplished by the participant the score is 1, otherwise the score is 0;
2) If the participant commits an error, the score is -1;
3) The Completion Rate is calculated by the formula:

$$Completion\ Rate\ (\%) = \frac{Number\ of\ Comlpeted\ Subtasks}{Number\ of\ Subtasks} * 100$$

Table 3 Completion Rate Calculation: Task 3

	PP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	MEAN	SD
Create a new file	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Open the Template of Gonçalo chair	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Change the number of Legs to 3	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Insert a Seat Front Rail	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Insert 4 Seat Cross Rails	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Remove the armrest	0.5	1	1	1	1	1	1	1	1	1	1	1	0.00
Insert a Base Radial Rail	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Save the file	1	1	1	1	1	1	1	1	1	1	1	1	0.00
ERRORS	0	0	0	-1	0	0	0	0	0	0	0	-0.1	0.32
TOTAL	7.5	8	8	7	8	8	8	8	8	8	8	**7.9**	**0.32**
TOTAL (%)	93.75	100	100	87.5	100	100	100	100	100	100	100	**98.75**	**3.95**

Task 4

Method for the calculation of the Completion Rate: the method is equal to the Task 3

Table 4 Completion Rate Calculation: Task 4

	PP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	MEAN	SD
Develop an original concept	1	0	1	1	1	1	1	1	1	1	1	0.9	0.32
Develop a multipurpose chair	1	1	1	1	1	1	1	1	0	1	1	0.9	0.32
Use ChairDNA	1	1	1	1	1	1	1	1	1	1	1	1	0.00
Deliver a 3D Digital Model	1	1	1	1	1	1	1	1	1	1	1	1	0.00
TOTAL	4	3	4	4	4	4	4	4	3	4	4	**3.8**	**0.42**
TOTAL (%)	100	75	100	100	100	100	100	100	75	100	100	**95**	**10.54**

Appendix 7.B.9 Participants Inspirations

P1 *Cut*, Toni Grilo (2015)

P2 *Panton*, Verner Panton (1967)

Imaginary of the traditional wooden chair

P3 Participant's description (2017)

P4 *Gonçalo*, Gonçalo Santos (1953)

P5 *First*, Michele De Lucchi (1983)

P6 N/A

P7 *DAX*, Charles & Ray Eames (1950)

P8 N/A

P9 Participant's sketch (2017)

P10 *Autoprogettazione,* Enzo Mari (2014, p. 47)

Appendix 7.B.10 Observation Notes

Table 7.5 Observation notes of PP

PART	TYPE	DESCRIPTION
Interview	✍ Comment	A10: The participant consulted the glossary. The research phase can be a subphase of any other phases; moreover the phases are not sequential, they intersect
	☠ Bug (P)	A10/A11/PB8: are not displaying the 'Other' option
	✍ Comment	[A10, Other] (Illustrator): development
	✍ Comment	[A11, Other] (Illustrator): communication
	✍ Comment	A13: the answer for 'Design studio' corresponds to 'Agency'
	✍ Comment	PB10: the question is not logical because designers use all processes. The participant associates the term 'analogical' to 'physical'
Task 1	🖉 Observation	This task was not scheduled in the Pilot-test but the participant wanted to perform it
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode
	? Help	With above
	☑ Suggestion	Create relations: match the Back Leg with the Front Leg
	? Help	Indicate Seat Panel (to assign thickness)
	? Help	The participant asked how to do slats (but she discovered later by herself, in Task 3 – subtask of adding 4 Seat Cross Rails)
	☑ Suggestion	Application: For industrial application Because one can insert specific constraints/values that will match specific machines
	✍ Comment	ChairDNA has an excess of detail that is not suitable for the concept phase Because it is very specific, there is not much freedom for creation
	✍ Comment	The participant would rename 'Top radius' to 'fillet' (from AutoCAD)
	🖉 Observation	The participant did not know many terms (e.g. Stretchers), but learned by watching the effects
	? Help	There is no need to edit the guides before inserting the parts
	✍ Comment	ChairDNA becomes slower as parts are added
	? Help	Indicate the Section Square (in Arms Outer Frame)
Task 2	🖉 Observation	Script: Specify that the level of detail of the reproduction is limited by ChairDNA
	? Help	The Taper Ratio (Front Leg) decreases towards 0 (not towards 100)
	☠ Bug (P)	Leg Taper Ratio did not actualize with the New command
	☒ Error	The participant accidentally pressed 'Random' (she wanted to save), and had to start everything from the beginning
	☑ Suggestion	Undo command
	? Help	Indicate Seat Width and explain the reference with the Leg
	☠ Bug (P)	The need to change the number by one digit at a time (Seat Width)
	☒ Error	Inserted Seat Cross Rail (and deleted)
	☒ Error	The participant changed the Stretchers Height in Front/Back Stretchers and not in Stretchers Guides
	? Help	With above
	? Help	Indicate Back Cross Rail Height (the participant thought that the was manipulated in Back Guides, by analogy with Front Stretchers Height)
	? Help	Irreproducible: Back Cross Rail curvature
Task 3	✍ Comment	To do Slats in the seat is just insert a number
	? Help	Indicate Base Radial Rail
Task 4*	🖉 Observation	The participant generated random 2 times
	? Help	Edit visualization options in Rhino (display and orbit)
	✍ Comment	ChairDNA as a pedagogical tool: The participant felt she was learning about chair terminology (e.g. Stretchers)
	? Help	Suggested to change to Solid Mode to see the Legs
	? Help	Indicated the parts to remove (Back Stretcher & Base Back Rail)
	✍ Comment	"[The Random mode] is the computer being creative." "*Isto é uma loucura (…) é o computador a ser criativo*"
	? Help	Leg with no taper is 100%
	☑ Suggestion	Align options: align the Legs with the Seat
	? Help	Explain the Arms Height (the distance at front in relation to the Seat)
	? Help	The section of Arm Back Support (from Back Legs) is affected by the Back Leg section
	? Help	How to alight the Back Leg and the Arm Back Support
	✍ Comment	The design looks like an ant
	? Help	When the user accidently changes the shape in Rhino, it reconfigures when changing a parameter in ChairDNA
	? Help	Orbit command in Rhino (in the icon or in the right mouse button)
	? Help	Indicate Back Height Spacing
	✍ Comment	The participant called the design a throne
	? Help	The armrest section is not affected by the Arm Back Support (from Back Legs)
	🖉 Observation	The task 4 was planned but not executed
Questionnaire	✍ Comment	C13: Random could be useful in a plastic seat
	✍ Comment	C15: The question is not very logical
	✍ Comment	She wanted more freedom (in 3D Max she pulls points in the model); or just selecting values beyond decimals (but

		the ChairDNA does)
	✍ Comment	The seat and legs are not in relation (but the ChairDNA does)
	✍ Comment	The final score (3) was mainly due to usability issues

Table 7.6 Observation notes of P1

PART	TYPE	DESCRIPTION
Interview	✍ Comment	[About a chair from the designer]: The goal of the design is to earn money *Temos aí uma cadeira muito falada mas que não vendeu uma unidade; isso para mim não é uma cadeira*
	🖉 Observation	The studio makes 2 projects per week, because they receive through royalties
	🖉 Observation	Script 1: Include question: duration of the project (2 days)
	🖉 Observation	Script 1: Include question: number of chairs sold
	? Help	[PB12] *Do geral para o particular: significa da forma geral para o detalhe*
		[PB13] The participant created guides in AutoCAD
Task 1	☒ Error	Intuitively he tried to move the points in Rhino
	? Help	Explain what could be done in Rhino and in the ChairDNA
	✍ Comment	Units: replace relative values (percentages) by absolute values (millimetres and degrees): the participant thinks in absolute values
	? Help	What parameters use millimetres (in the dimensions)
	? Help	Find thickness
	☑ Suggestion	Align options: align the Legs with the Seat (could include justify options as align centre and align left)
	☑ Suggestion	Interface: Move Panels to the top of the windows
	☑ Suggestion	Interface: change the order of the tabs to: Seat, Legs, Back
	✍ Comment	"487 [of seat width] is large, is for a chair with arms" [this reveals experience in chair design]
	? Help	Explain what curvatures could be found
	☑ Suggestion	Manipulate the shape directly in the 3D model (by dragging points)
Task 2	🖉 Observation	The participant edited the chair of the previous task
	☒ Error	The participant simulated the Seat Outer Frame by the Seat Panel
	☒ Error	Inserted the Arms Guides
	? Help	Irreproducible: Back Cross Rail curvature
Task 3	? Help	Indicate Base Radial Rail
	☠ Bug (P)	Uncheck Arm Side Support
Task 4	🖉 Observation	Strategy: generated the design from scratch
	🖉 Observation	Goal: reproduce the Cut Chair
	☒ Error	The participant tried to reproduce the base block by increasing the Seat Panel thickness
	? Help	Indicate Leg Panels
	☠ Bug (P)	In text field, the need to change the number by one digit at a time (insert 420 in Seat Width)
	? Help	Irreproducible: Back Panel bottom edge in the middle of the Seat
	? Help	Irreproducible: Base block
	? Help	Irreproducible: round the corners of the base block
	🖉 Observation	Script 2: Include a task to generate random chairs, if the user did not used it is task 4
Questionnaire	☑ Suggestion	Add: Detail components library: Woodworking joints (e.g. choose the type of joint and two pieces, and the program would automatically generate the ideal geometry)
	✍ Comment	[D13, Desenvolvimento]: ChairDNA is useful to develop a concept; the program is equivalent to the tools for developing lettering *Se vou criar uma cadeira já tenho uma ideia dela*

Table 7.7 Observation notes of P2

PART	TYPE	DESCRIPTION
Interview	🖉 Observation	Script 1: Include question: duration of the project (1 month)
Task 1	☒ Error	The participant tried to use the Rhino commands
	? Help	Explain what could be done in Rhino and in the ChairDNA
	? Help	Percentages meaning: Front Leg spacing
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode
	? Help	With above
	? Help	The Diameter (of Front Leg) is in real size
	? Help	Irreproducible: the chair the participant wanted to draw (asymmetrical, in one gesture)
	☑ Suggestion	Add: generate asymmetrical chairs (see the drawing)
	☑ Suggestion	Draw the shape in one gesture (not fragmented into parts)
	☑ Suggestion	Move the units after the text-field (optional)
	? Help	Explain visualization features of Rhino (how to do Orbit and Display)
	? Help	Indicate Seat Outer Frame
	☑ Suggestion	Add: other section shapes (e.g. oval)
	✍ Comment	ChairDNA is useful to visualize in a direct and rapid mode slopes and dimensions *Visualizar de forma directa e rápida inclinações e dimensões*
	✍ Comment	ChairDNA has an excess of text-based commands

		Sinto alguma rigidez, porque é tudo à base do texto; há muita informação no interface
	☑ Suggestion	Include icons
	☑ Suggestion	Interface: provide feedback to the user on what is changing in the 3d model (e.g. highlight in a different colour the seat guides when changing the Seat Width)
	☑ Suggestion	Approximate the interaction to the gesture of drawing (draw a shape with the mouse and the program would generate the 3D model, with all the parameters); in order to find more naturalistic/organic shapes (see the drawing) *Sentia que estava mais a desenhar*
	? Help	Indicate Save
Task 2	? Help	The effect of changing the diameter is only visible in Solid Mode
	🖉 Observation	Difficulties in manipulating sliders (Splay/Rake Angle of Front Leg)
	? Help	Irreproducible: Legs curvature (Back Leg/Back Upright)
	? Help	Indicate Back Upright (to make the continuous shape of the Back)
	☠ Bug (P)	In text field, the need to change the number by one digit at a time (Seat Width)
	☒ Error	Inserted Seat Cross Rail (and deleted)
	☒ Error	Inserted Seat Long Rail (and deleted)
	☒ Error	Changed Back Legs Spacing
	☠ Bug (P)	ERROR: Back Leg spacing in 12
	? Help	To obtain a curved Seat Outer Frame, the Leg Spacing needs to be 0
	? Help	Indicate Stretchers
	? Help	Indicate Stretchers Height
	☒ Error	Changed the Back Upright Height to change Back Height
	☒ Error	The participant tried to calculate the Back Height by subtracting the Overall Height with the Seat Height
	? Help	Explain the Back Bottom Radius
	? Help	Explain the Back Width
	🖉 Observation	The participant quit the task before finishing Script 2: Task 2 is very long and complex
Task 3	☠ Bug (P)	Uncheck Arm Side Support
	? Help	Indicate Base Radial Rail
Task 4	☠ Bug (P)	ERROR: in opening Panton
	🖉 Observation	Strategy: Edited a chair from templates (Panton)
	? Help	Indicate the Back Top Radius
	? Help	Indicate the Splay Angle of Legs Front Panel
Questionnaire	✍ Comment	ChairDNA has an excess of detail that is not suitable for the concept phase *Perdes tempo com coisas que não são importantes na fase de conceito*
	☑ Suggestion	Script 2: Simplify and shorten task 2, to learn the program
	✍ Comment	[D1] Script 2: Limit the decision making can have a positive or a negative connotation

Table 7.8 Observation notes of P3

PART	TYPE	DESCRIPTION
Interview	🖉 Observation	Script 1: Include question: duration of the project (4-6 weeks)
	🖉 Observation	Script 1: include question: the number of chairs designed by the participant
	✍ Comment	Orca – number of units produced: 60
Task 1	? Help	Percentage meaning: Leg spacing
	☠ Bug (P)	In text field, the inability to delete any number (e.g. Front Leg Width Spacing)
	? Help	With above
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode
	? Help	With above
	✍ Comment	Units: replace relative values (percentages) by absolute values (millimetres and degrees): the participant thinks in absolute values (e.g. Seat Taper Width)
	? Help	Indicate Seat Inner Frame Square Section
	? Help	Irreproducible: curvature of the shell
	🖉 Observation	The experienced Rhinoceros users used the display options (display in Rendered Viewport)
	? Help	The Back-Seat Angle is in relation with the Seat
	? Help	Percentage meaning: Back Width (relation to Seat Back curve)
	☑ Suggestion	Range: Back Width maximum limit could be higher
	🖉 Observation	Rail in Portuguese in called *travessa*
	? Help	Indicate Back Height Spacing
	☑ Suggestion	Switch the Back Height Spacing for the Back Panel Height
	🖉 Observation	ChairDNA becomes slower as parts are added (e.g. in Stretchers)
	? Help	Percentage meaning: Stretchers Height
	✍ Comment	The user needs to understand that first he needs to create an underlying guide before placing the parts
	? Help	Name: confusion of the Cross rail with the X-shaped Radial Rail
	? Help	Explain Base (elements in the ground)
	? Help	Indicate Back Leg Rake Angle
	? Help	Save: confusion with the Rhino Save
	☑ Suggestion	Interface: Give the Save command more visibility
Task 2	🖉 Observation	He opened a new file
	🖉 Observation	He started from the Seat

	✍ Comment	Irreproducible: Seat Front curvature
	? Help	The effect of changing the thickness is only visible in Solid Mode
	☠ Bug (P)	Switched from Solid to Wireframe without clicking
	🖉 Observation	Switch the positive with the negative in the Guides Taper Width The participant moved the Back Taper Width to the opposite side of the intended
	? Help	Activation sequence: the participant wanted place the Back Frame after the Seat Panel
	☑ Suggestion	Align options: align the Legs with the Seat
	? Help	How to manually align the Legs with the Seat (by changing Leg Spacing)
	☑ Suggestion	Range: Narrow some parameter ranges (the case of positive Rake Angle)
	☒ Error	Inserted Leg Radial Panel (and removed)
	☒ Error	Inserted Leg Front Panel (and removed)
	☑ Suggestion	Align options: Align the Stretchers Outer Frame inside the legs
	☒ Error	Inserted Radial Stretcher (and deleted)
	☒ Error	Inserted Seat Outer Frame but then deleted
	? Help	Indicate Back Outer Diameter (to match the thickness of the Back Top Rail with the Back Upright/Back Leg)
	? Help	Irreproducible: Back Plane curvature (reason for the discontinuity of the Back Top Rail)
	? Help	Irreproducible: Back Cross Rail curvature
	? Help	Percentage meaning: Back Cross Rail Height
Task 3	☒ Error	Changed the Back Leg Depth Spacing
	? Help	Indicate the tab of Arm Side Support
	☠ Bug (P)	Crash in Save
Task 4	🖉 Observation	Strategy: he explored the Random command and opened the Wishbone chair, but opted to edit the chair of the first task
	? Help	Indicate Random
	☠ Bug (P)	Back Leg Taper Ratio does not have effect (when Back Upright is placed)
	? Help	Help with above
	? Help	Indicate Back Leg Width Spacing
	☒ Error	Clicked in the Save of Rhino
	✍ Comment	Some commands names are not very self-explanatory (e.g. Cross, Radial)
Questionnaire	✍ Comment	[C3] The program has too many commands (e.g. Stretchers Panel)
	✍ Comment	[C14] E.g. Rhino icon for 'Taper'
	✍ Comment	It does not pay to manufacture a single chair in a CNC. Usually the manufacturing is done by batches of components, i.e., one component is programmed and then 50-100 equal components are produced. The process is repeated with the other components of the chair. The assembly is done manually at the end.
	✍ Comment	[D9] ChairDNA is restricted to one type of product: the participant would not purchase the program because it is restricted to chairs, and there are not so much projects of chairs. Furthermore, parametric modelling can be done in SolidWorks.
	✍ Comment	[D13, Research] To study options for shape. But the final 3D model would have to be rebuilt from scratch.
	✍ Comment	[D17] For a pedagogical purpose. The danger (particularly for inexperienced designers) relies on the illusion that the generated model seems a final ended version of the chair.

Table 7.9 Observation notes of P4

PART	TYPE	DESCRIPTION
Interview	✍ Comment	[PB1] Influences: Facie chair (from the author)
	✍ Comment	[PB13] The participant provides to design students a grid named '4x40', to refer the bounding volume of the chair with standard measures of 40x40x40cm for the Seat Width, Depth and Height, and 40cm for the Back Height
Task 1	☒ Error	Intuitively the participant tried to interact with Rhino
	? Help	Explain Wireframe/Solid Mode
	☑ Suggestion	Provide alerts to the user (e.g.: the Leg Front Panel disallows the usage of the space under the seat, which makes it difficult to exit the chair)
	? Help	Indicate Back Panel
	? Help	Indicate Back-Seat Angle
	? Help	Explain visualization features of Rhino (how to do Orbit)
	? Help	Indicate Taper Width
	☑ Suggestion	The program is only applicable to static chairs; it should include simulations of movement (material flexibility, tilt, etc.) and transformations (inflatable, folding, etc.)
	☠ Bug (P)	The effect of changing the thickness is only visible in Solid Mode
	? Help	With above
	☑ Suggestion	Block relations (e.g. the Back Angle to be independent from the Seat Angle)
	☠ Bug (P)	Align the Seat Panel bellow the Seat Guides (not in the middle)
	? Help	Irreproducible: Seat and Back curvature (comfort curvature, in two directions)
	? Help	Indicate Seat Taper Width
	? Help	Indicate Back Width (which does not work above 50 when Seat Rear Radius is 0)
Task 2	🖉 Observation	Strategy: started from the previous chair
	✍ Comment	The fact that the Back 'curvature' follows the Seat back curvature is interesting
	? Help	Indicate how to remove the Back Panel
	? Help	Indicate Back Upright

	✍ Comment	Difficulties in manipulating sliders: some sliders are very sensitive, i.e., small changes in the slider position produce a big impact in the model (e.g. The Leg Splay angle)
	☒ Error	Inserted Back Bottom Rail (and deleted)
	? Help	Indicate Back Top Rail
	? Help	Indicate Back Cross Rail
	? Help	Irreproducible: Back Cross Rail curvature
	? Help	Indicate Back Cross Rail Height
	☒ Error	To obtain a curved Back Outer Frame, the Back Width needs to be 50
	? Help	Indicate Stretchers Outer Frame
	? Help	Indicate Stretchers Radius
	☒ Error	The participant noticed that the chair to be reproduced is not the original chair Thonet no. 14
	☒ Error	The participant moved the Front Stretcher Height (instead of the Stretchers Height)
	✍ Comment	ChairDNA becomes slower as parts are added (e.g. in Stretchers)
	☒ Error	The participant moved the Front Stretcher Height (instead of the Stretchers Height) - again
	✍ Comment	Sliders are very sensitive, e.g. Stretchers Height
	? Help	Irreproducible: double Back Upright
	☠ Bug	Crash in Save
Task 3	? Help	Opening the *Gonçalo* chair
	✍ Comment	The participant searched for the parameter of Leg Number
	? Help	Changing the number of legs to 3
	? Help	Adding Seat Front Rail (suggest to change the Tab)
	? Help	Removing Armrest (suggest to change the Tab)
	☒ Error	Inserted Base Front Rail (and deleted)
	? Help	Indicate Base Radial Rail
	✍ Comment	The participant noticed that the chair does not have stability
Task 4	🖉 Observation	Strategy: Edited the chair from Task 3
	☠ Bug	Switched from Solid to Wireframe without clicking
	? Help	Indicate Legs Panels
	? Help	Indicate Back Legs Rake Angle and Depth Spacing
	? Help	The effect of changing the thickness is only visible in Solid Mode
	? Help	Indicate how to remove Base Radial Rail
	? Help	Indicate how to remove Legs Side Panel
	✍ Comment	Add: Seat Panel Border Curvature
Questionnaire	✍ Comment	It is interesting the Back accompanying the curvature of the Seat
	✍ Comment	The virtue of the program is to transform existent solutions (the participant would not use the program to generate solutions from zero)
	✍ Comment	[C1] If the command names were in Portuguese it would be easier (e.g. Travessas), only with practice one gets used to the terminology
	☑ Suggestion	[C3] Include commands to generate parallel double elements
	✍ Comment	ChairDNA is supporting a task that the designer performs manually; it should instead automate design tasks that would benefit in terms of speed *Este tipo de abordagem faço à mão, o computador deve dar automatismos de coisas que não fazemos tão rapidamente*
	☑ Suggestion	The program should incorporate more freer forms, in a process like sculpting
	✍ Comment	[C13] The random is not suitable because the participant likes to control the generation process, moreover the random solutions look more like a sculpture than a chair
	✍ Comment	[D1] All the programs limit the decision making (that is why the participant uses drawing). But it will only limit if the user allows himself to be limited *Não limita, só se a pessoa se deixar limitar*
	✍ Comment	[D1] Chair DNA does not allow the designer to take risks nor to break conventions, because it is limited to existing archetypes. It suggests pre-determined shapes (conventional legged chairs) and thus it is not suitable to design a new chair.
	☑ Suggestion	[D9] Include as many products as possible (all furniture types), as no one would buy a program only to do chairs
	✍ Comment	The participant would recommend the program as a pedagogical tool (to teach metrics and chair typologies). The program is directed to apprentices. In fact, the participant provided in the last exercise to his students the same wireframe structure (40x40x40). For the designer it would be more useful for refinement. *É mais útil para afinar, para apurar*

Table 7.10 Observation notes of P5

PART	TYPE	DESCRIPTION
Interview	🖉 Observation	[A5] Company: Ynvisible
	🖉 Observation	[PA7] Company: Agostinho Figueiredo e Filho LDA (Morada: Rua do Lumiar 33, Lisboa)
Task 1	? Help	Explain what can be done in Rhino
	? Help	There is no variable of Leg Number
	☑ Suggestion	Generate chairs symmetrical to other planes (with that surprising effects could be produced)
	☑ Suggestion	Add: variable of Leg Number (to select before placing the Legs)
	🖉 Observation	The experienced Rhinoceros users used the display options (display in Shaded Viewport)
	✍ Comment	ChairDNA allows drifting in the solution space without any particular goal

		Muito giro, é uma forma de navegar na maionese, quando não há logo um objectivo
	☑ Suggestion	Help mode: Displays tooltips with icons (whenever the user hovers the pointer over an element, the icon of the element appear), whenever the user activates the help mode option
	? Help	Indicate Seat Panel
	☑ Suggestion	Interface: Move Panels to the top of the windows (because when changing the parameters of Guides it is not visible the effect)
	✍ Comment	ChairDNA is useful to explore the main aspects of the form within the correct percentiles
	☒ Error	Clicked in the Save of Rhino
Task 2	✎ Observation	The participant started by the Seat
	☠ Bug (P)	In text field, the need to change the number by one digit at a time (Seat Width)
	? Help	With above
	☒ Error	The participant tried to insert the value of the Overall Depth (in the image) in Seat Depth
	? Help	With above
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode (e.g. Seat Outer Frame Diameter)
	? Help	With above
	✍ Comment	Irreproducible: woven cane Seat
	? Help	Activation sequence: The participant wanted to place the Back Frame after the Seat Outer Frame (which he actually could)
	☒ Error	Changed Back Legs Spacing
	? Help	To obtain a curved Seat Outer Frame, the Leg Spacing needs to be 0
	? Help	Irreproducible: Legs curvature
	☑ Suggestion	Add: Leg curvature (by manipulating a point in the middle of the Legs; or by selecting the number of Bézier curves)
	☠ Bug (E)	Leg Taper Ratio did not actualize with the New command
	☑ Suggestion	Interface: display a different shaded area for each collapsible menu (e.g. to better distinguish the Front Leg from the Back Leg)
	✍ Comment	Irreproducible: Stretchers Outer Frame inside the legs
	✎ Observation	The participant uses a lot more the sliders than the text-fields
	☒ Error	He changed the Back Upright Height instead of Back Height
	☑ Suggestion	Display variable: Back Height above the ground
	? Help	Back Height: measured from the Seat
	☒ Error	The participant tried to calculate the Back Height by subtracting the Overall Height with the Seat Height
	☒ Error	He placed the Back Bottom Rail
	✍ Comment	Irreproducible: Back Cross Rail curvature
	? Help	Back Top radius was not working because Back Width Spacing was not equal to 0
	☠ Bug (P)	ERROR: was solved by changing the value of the Back Top Radius (from 15 to 23)
	? Help	Indicate the Back Taper Width
Task 3	? Help	Indicate the Base Radial Rail (Tab)
Task 4	✎ Observation	Strategy: generated the design from scratch
	? Help	The program is limited to 4 linear legs
	☑ Suggestion	Add: allow the generation of more than four linear legs
	? Help	Explain that when the Legs are placed outside the area, the Seat Rails connect the legs
	✍ Comment	ChairDNA allows the understanding of the relations between elements; as when he is controlling some features there are things happening meanwhile (e.g. Back Panel tilts when changing Seat Tilt Angle)
	✍ Comment	ChairDNA promotes the ideas unblocking *Protencia desbloquear*
	✍ Comment	The random mode can be a great unblocker by providing ideas 'out of the box' *O random pode ser um grande desbloqueador, já que estamos sempre limitados ao nosso conhecimento e experiência*
Questionnaire	? Help	[B2] Explain the meaning of 'analógica'
	✍ Comment	[B4] Goal: did not have any specific goal Perhaps the task 4 should be more specific (e.g. chair for elderly)
	✍ Comment	Pedagogical purposes: ChairDNA could be useful in the Ergonomics class
	✍ Comment	[D1] Limits in the sense that it displays one solution, and in our mind it is more free
	✍ Comment	[D11] The seat modelling would have to be another program, due to the inherent complexity *Só isso é um programa*
	✍ Comment	[D17] The inability to edit the shape directly
	✍ Comment	The participant asked if one could export to STL (yes, with Rhino)

Table 7.11 Reference notes of P6

PART	TYPE	DESCRIPTION
Interview	✎ Observation	Script 1: Include question: duration of the project (3 weeks)
Task 1	✍ Comment	The program always adds 2 legs (due to the symmetry)
	? Help	Indicate Leg 'thickness'
	? Help	Explain how to obtain only one leg
	✍ Comment	Allow the generation of more than four [linear] legs ("And if I wanted 1000 legs?")
	☠ Bug (E)	The joints of Seat Outer Frame are out of place (when Seat Outer Frame is connecting the Legs)
	✍ Comment	ChairDNA becomes slower as parts are added
	☑ Suggestion	Interface: Move Panels to the top of the windows (Back Panel before the Back Guides)
	? Help	Explain how the program chooses the support point (the Arm Side Support from the Back Legs)

	Bug (E)	The Arm Back Support and the Arm Side Support can be simultaneously extended from the Back Leg
	Comment	ChairDNA gives bizarre results (e.g.: the Arm Front Support from a Front Leg which has a certain spacing)
	Help	There is no Undo command
	Help	Explain visualization features of Rhino (how to do Orbit)
	Suggestion	Help mode: Highlight the parameters that can be manipulated when the user hovers the pointer over a point in the 3D model Because ChairDNA has many parameters (and you end up losing yourself)
	Help	Indicate Save
	Suggestion	Interface: Give the File menu more visibility
Task 2	Help	The measure from leg to leg is equal to Seat Width in the case of zero spacing
	Help	Explain the relation of the Legs with the Seat
	Bug (P)	In text field, the need to change the number by one digit at a time (Seat Width)
	Help	With above
	Error	The participant tried to insert the value of the Overall Depth (in the image) in Seat Depth
	Error	Changed Front Legs Spacing
	Bug (P)	ERROR: with Front Leg Width Spacing -15 and Depth Spacing -15
	Comment	It is easier to firstly work on the Seat, because the legs will then be adjusted to it
	Help	Indicate Seat Depth
	Observation	Align options: align the Legs with the Seat (the participant adjusted the leg spacing in order to align Legs with Seat)
	Help	Manipulate the shape directly in the 3D model (the participant asked if one could control the shape in Rhino)
	Error	The participant inserted and removed the Stretchers
	Error	The participant inserted and removed the Seat Side Rail
	Help	Indicate Stretchers
	Help	Indicate Stretchers Height
	Help	Irreproducible: Back Plane curvature (reason for the discontinuity of the Back Top Rail)
	Error	Inserted Back Bottom Rail (and deleted)
	Help	Indicate Stretchers Radius
	Comment	Percentages issue: Work with percentages is a little abstract, but it is a matter of habit
	Help	Irreproducible: Legs curvature (e.g. Back Leg and Back Upright)
	Help	Indicate Leg Taper Ratio
	Bug (P)	Back Leg Taper Ratio does not have effect (when Back Upright is placed)
	Bug (E)	Leg Taper Ratio did not actualize with the New command
	Error	Inserted Long Stretcher (and deleted)
	Help	Irreproducible: Stretchers Outer Frame inside the legs
	Help	To shrink everything proportionally you have to change the Seat dimensions
	Observation	Create relations: match Stretchers radius with Seat radius (the participant tried to adjust the Stretchers radius with the Seat radius)
	Error	Inserted Cross Stretcher (and deleted)
	Error	Inserted Radial Stretcher (and deleted)
	Help	Indicate Back Cross Rail (that was missing)
	Error	Inserted Stretchers Panel (and deleted)
	Error	Inserted Back Radial Rail (and deleted)
	Help	Irreproducible: Legs curvature (again)
Task 3	Error	Edited the Back Legs
	Bug (P)	ERROR: In Back Legs with Depth Spacing -2
	Error	Instead of using 'Save as' she used 'Save'
Task 4	Observation	Strategy: The participant opened Templates (Spaghetti, Universale, DKR) but she preferred to start from scratch
	Help	Irreproducible: Seat curvature (in z)
	Bug (P)	The effect of changing the thickness is only visible in Solid Mode
	Help	With above
	Bug (P)	Switched from Solid to Wireframe without clicking
	Bug (E)	Leg Taper Ratio did not actualize with the New command (again)
	Observation	Align options: align the Legs with the Seat (the participant tried to align the Legs with the Seat)
	Observation	The participant uses a lot more the orthogonal views than the perspective view (unlike the previous participants)
	Error	The participant tried to insert the Armrest without any Arm Support
	Help	Indicate Arms Depth Spacing
	Help	Suggest to use the Back Upright instead of the Back Arm Support
	Help	Suggest to change Back Leg Spacing to 0 (to remove the 'knot')
	Error	The participant moved the Back Leg Depth Spacing instead of the Width Spacing
	Help	Indicate Back Width
	Help	Indicate Stretchers Height
	Help	Indicate Stretchers Tilt Angle
	Bug (P)	ERROR: With Seat Width (change from 455 to 530 to restore)
Questionnaire	Observation	[C11] As this is the only question made by the negative, the participants hesitate a little
	Comment	[D12] The participant detected the trick question (the program can already generate stools)
	Comment	[D13, Concept] To develop the structure of the chair
	Suggestion	Add: Detail components library: Hardware items (screws, caster wheels, etc.) and joints (and thus save time in drawing)
	Comment	[D15] Block some relations (e.g. allow the Legs not to change place in relation to the Seat)
	Suggestion	[D17] Allow detail (e.g. joints)

Table 7.12 Reference notes of P7

PART	TYPE	DESCRIPTION
Interview	Observation	Script 1: Include question: duration of the project (2 months)
	Comment	He used the curvature of the Eames chair. He did not changed it because it is already proven that it works very well [this is a routine task that could be automated]
Task 1	☒ Error	The participant tried to edit the shape in Rhino
	Comment	Application: The program is suitable to redesign
	Help	Explain what could be done in Rhino and in the ChairDNA
	Help	Demonstration: the evaluator inserted a Front Leg
	Bug (P)	Switched from Solid to Wireframe without clicking
	Comment	Experience: The participant does not have any experience with in 3D computer graphics. He only works with AutoCAD 2D (he learned with AutoCAD 12.0 in 1992), and CorelDRAW (to beautify his hand-made perspectives) He always delivers the tasks in SolidWorks to others (designers of the studio), for that reason he is not interesting in learning new programs.
	☑ Suggestion	Interface: Manipulate the shape directly in the 3D model "The natural tendency is to manipulate directly in the model" *A tendência natural é manipular directamente no modelo* The participant is used to the direct interaction of the drawing, not to an indirect triangulation between the mouse, the interface and the 3D model.
	Comment	ChairDNA does not have the spontaneous, inaccurate, manual side that the drawing has
	Help	Explain the meaning of Stretchers
	Help	Indicate Back Leg
	Help	Indicate Seat Panel (to assign thickness)
	Comment	The motivation to learn a program is related to the satisfaction with the results obtained with the program: the higher the satisfaction, the higher the motivation
	Help	Irreproducible: insert modules of components (predefined types of parts)
	☑ Suggestion	Add: Include predefined types of parts (e.g. types of Back) 3CAD Evolution – product parametric configurator, for furniture and interior design area (works with modules of components)
	Help	Explain the meaning of Seat Front Rail
	Help	The evaluator made a demonstration about how to do a simple chair (Seat, Legs, Back)
	Comment	Students are reluctant to drawing (as they do not see utility) [as the participant is reluctant to digital modelling]
	Comment	ChairDNA reveals an effort of simplification of the work process, which is particularly beneficial for inexperienced 3D CAD programs users
	Comment	ChairDNA allows the understanding of the relations between elements: "It is interesting that when we manipulate the Seat Back Radius it will deform and adapt the Back area"
	Comment	Application, Redesign: "Truth be told, almost all chairs depart from certain types of iconic forms" *Verdade seja dita, quase todas as cadeiras partem sempre de determinado tipo de formas icónicas*
Task 2	Help	Indicate 'New'
	Observation	The participant did not perform this task
	Comment	Design Process: ChairDNA suits the participant's design process which is largely based in redesign
Task 3	Help	Change the number of legs to 3
	Help	Seat Front Rail
	Help	Seat Cross Rails
	Help	Base Radial Rail
Task 4	Observation	Strategy: Edited a chair from templates (DAX) Before he opened the chair One
	Help	Explain the meaning of Seat Outer Frame Diameter
	Help	Explain the meaning of Arms Height
	Help	Indicate Arms Tilt Angle
	☒ Error	The Arms Tilt Angle was moved to the opposite side of the intended
	Help	Irreproducible: Seat curvatures
	Help	Explain the meaning of Stretchers
	☑ Suggestion	Approximate the interaction to the gesture of sculpting (drag points)
	Comment	Templates: ChairDNA allows a fast and agile way of drawing a chair, inspired in one of the 26 iconic chairs
	Comment	Suitable for inexperienced users
	Help	Renders can be made using Rhino features
	Help	Indicate Save as
Questionnaire	Comment	The program allows easiness in using forms
	Comment	[C8] The answer ('1') may be unfair, because the participant did not have time to explore the program
	☑ Suggestion	Add: Include two distinct modules: one to draw with more precision and other to draw with less accuracy *Quanto tiver essa dualidade, venha cá vender-me o programa*
	Comment	[D12] ChairDNA is suitable to design stereotyped chairs (as office chairs), as it is based on 26 stereotypes
	Comment	[D13, Development] It is based on pre-established elements

Table 7.13 Observation notes of P8

PART	TYPE	DESCRIPTION
Interview	✍ Comment	Script: is made to young designers (e.g. in BP11, the inspirations are the designer's past experience and everyday life experience)
Task 1	? Help	ChairDNA ranges follow anthropometric standards for multipurpose chairs
	? Help	Explain what could be done in Rhino and in the ChairDNA
	? Help	Indicate Back
	? Help	Indicate Seat-Back Angle
	? Help	Explain what could be done in Rhino and in the ChairDNA (the participant thought that ChairDNA only generated guides)
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode
	? Help	With above
	? Help	Indicate Back Leg
	✍ Comment	Interface: Difficulties in manipulating sliders
	? Help	Indicate Back Top Rail
	? Help	Indicate Seat Panel
	☠ Bug (P)	Interface: The Diameter of the Inner Sections is not hidden by default
	? Help	Indicate Back Panel (scroll down)
	? Help	Indicate Save
Task 2	? Help	Indicate New
	✍ Comment	The participant noticed that Chair 214 is not the original one
	? Help	Activation sequence: the participant wanted to start by the Back Frame
	? Help	Indicate Front Leg Taper Ratio
	? Help	Irreproducible: Legs curvature
	? Help	Indicate Seat Outer Frame
	? Help	Indicate Seat Front Radius
	? Help	Indicate Seat Rear Radius
	? Help	Indicate Back Leg Rake Angle
	✍ Comment	Interface: The slider sensibility is different (in Back Leg Rake Angle)
	? Help	Indicate Back Top Rail
	? Help	Indicate Back Cross Rail
	? Help	Indicate Back Cross Rail Height
	✍ Comment	ChairDNA becomes slower as parts are added
	? Help	Irreproducible: Back Cross Rail curvature
	? Help	Indicate Stretchers
	? Help	Indicate Stretchers Radius
	? Help	Because the program is slow, one have to wait after each action for the effect in the 3D model [Evaluator: Include a progress indicator, i.e., a feedback when loading]
	✍ Comment	"ChairDNA is playful, because one gets enthusiastic about what he is doing, as it gets surprised about his own abilities" *O programa é lúdico; entusiasma como como o desenho*
	? Help	Indicate Save as
	✍ Comment	The lower classification of the task is justified by the fact that the result is still formally far away from the original
Task 3	? Help	Opening the *Gonçalo* chair
	? Help	Changing the number of legs to 3
	☑ Suggestion	Add: variable of Leg Number
	? Help	Indicate Seat Cross Rail Number (not consistent with the Legs)
	☠ Bug (P)	In the text-field, the inability to delete any number (e.g.: Seat Cross Rail)
	? Help	Removing Armrest
Task 4	🖉 Observation	Strategy: The participant experimented the Templates, to be faster (Magic chair) but ended up to open a New file
	? Help	Indicate Open Templates
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode
	? Help	With above
	? Help	The participant asked if the program could generate a fully circular Seat
	? Help	Explain that the Back Panel follows the Seat Back curvature
	? Help	Irreproducible: Leg Back Panel curvature
	☑ Suggestion	Create relations: match Legs Back Panel to the Seat Back Curvature (as the Back Panel does)
	🖉 Observation	The participant has no experience in 3D CAD software (he previously undertook one training course on AutoCAD 2D, and he currently uses InDesign).
	✍ Comment	Comparison of tools: ***Drawing***: is a very powerful tool: (1) Registration tool (of an idea that the designer has in mind), producing results quickly (if the designer is an experienced drawer) and with personality (programs level everything equally); (2) Validation tool, for the designer to see if an idea works (is not the end in itself); (3) [Development tool], allowing the experimentation and thinking; Students nowadays use the drawing as much as digital tools (unlike a few years ago when they were only using

		digital tools). ***Software***: (1) Communication tool - the potential of producing renderings (an almost real perspective); and to produce quickly a technical drawing (it takes one day when manually it tool about 15 days). The danger of digital tools is the illusion of things looking real, but that may not be produced in reality ***Prototypes:*** has the benefit of materiality (reproducing materials, processes, etc.)
	✍ Comment	Design is a trichotomy between process, concept, and material
Questionnaire	🖉 Observation	Scripts: LimeSurvey autocorrects spelling according to the English language, but the participants are writing in Portuguese
	? Help	The first question group is concerning the last task made with ChairDNA
	✍ Comment	[C3] Missing commands: curvatures (Back Cross Rail, Legs)
	✍ Comment	[C14] Icons do not have nationality
	✍ Comment	[D13, Development] The participant would use ChairDNA to test and develop an idea that is already drawn

Table 7.14 Observation notes of P9

PART	TYPE	DESCRIPTION
Task 1	? Help	Explain what could be done in Rhino and in the ChairDNA
	✍ Comment	ChairDNA is more suitable for experienced chair designers, that already have their own favourite measures (e.g. the Back-Seat angle of 97°)
	☠ Bug (P)	In text field, the need to change the number by one digit at a time
	? Help	With above
	? Help	The Back Height is not the height above ground; is the Height of Back Guides
	☑ Suggestion	Display variable: Back Height above ground
	? Help	The Back-Seat Angle is in relation to the Seat
	☠ Bug (P)	The effect of changing the diameter is only visible in Solid Mode (e.g. Front Leg)
	? Help	With above
	✍ Comment	ChairDNA modelling capacity lacks of plasticity when compared to more powerful modellers, as Rhino
	☑ Suggestion	Add: Other section shapes
	? Help	The model produced with ChairDNA can be subsequently developed in other CAD applications
	✍ Comment	ChairDNA provides a background grid to be worked subsequently in the foreground *O ChairDNA providencia uma base para trabalhar por cima*
	☠ Bug (P)	Switched from Solid to Wireframe without clicking (and was a constant during the tasks)
	☑ Suggestion	Include predefined guides for different types of chairs (e.g. Stacking chair, Sledge chair) and/or different types of parts (e.g. Lower Back chair)
	✍ Comment	Application: For industrial application, i.e., companies that manufacture large quantities of chairs (e.g. Fenabel), because they work with slight changes on a set of predefined designs
	? Help	Indicate Save (is not in Rhino but in ChairDNA)
Task 2	🖉 Observation	He edited the chair of the previous task
	☒ Error	The participant tried to calculate the Back Height by subtracting the Overall Height with the Seat Height
	? Help	Back Width works with percentage, should be 50
	🖉 Observation	The experienced Rhinoceros users used the display options (e.g. turned the grid lines and axes off in Rhino with F7)
	? Help	Irreproducible: Seat Front curvature
	? Help	Irreproducible: Back Plane curvature
	? Help	Values can be inserted in the text-field
	? Help	Switch to Solid Mode
	? Help	Indicate Back Upright
	? Help	Indicate Back Leg Rake Angle
	? Help	Irreproducible: Legs curvature
	✍ Comment	The experienced chair designers prefer the Leg to touch the wall instead of the backrest (because it allows grabbing the chair more easily)
	? Help	Indicate Seat Panel (to give thickness to the Seat)
	? Help	Indicate Seat Outer Frame Square Section
	☠ Bug (P)	Align the Seat Panel bellow the Seat Guides (not in the middle)
	🖉 Observation	To overcome the bug aforementioned, the participant decreased the Seat Height
	? Help	By decreasing the Seat Height, the Overall Height also decreases
	✍ Comment	ChairDNA becomes slower as parts are added
	☠ Bug (E)	ERROR: with Back Height in 400
	? Help	Align: the Legs with the Seat (change Legs spacing)
	☒ Error	The participant placed the Leg outside the Seat perimeter (and thus the Seat Outer Frame does not follow the Seat Guides curvature)
	☒ Error	Create relations: match Stretchers radius with Seat radius: The participant copied the values of the Seat Radius to the Stretchers Radius
	☠ Bug (P)	Stretchers Guides cannot be equal to Seat Guides because don't have Taper Width
	☒ Error	Inserted Radial Stretcher (and deleted)
	? Help	Name: confusion of the Cross rail with the X-shaped Radial Rail
	? Help	Irreproducible: Stretchers Outer Frame inside the legs
	✍ Comment	ChairDNA is based on parametric modelling, which allows the user to change the parameters without having to redraw the model (as SolidWorks)

	Help	Indicate Back Leg Width Spacing
	Error	Changed Back Legs Spacing
	Help	Backrest is not a Stretcher
	Error	Inserted Back Radial Rail (and deleted)
	Help	Irreproducible: Back Cross Rail curvature
	Help	Irreproducible: Back Cross Rail placed in the round part of the Back Top
	Help	Indicate Seat Panel (scroll down)
	Help	Irreproducible: texture (woven cane Seat)
Task 3	Help	Opening the *Gonçalo* chair
	Error	Deleted the Legs (and inserted)
	Error	Changed Leg Taper Ratio
	Error	Changed Back Leg Depth Spacing
	Help	Changing the number of legs to 3
	Help	Indicate Base Radial Rail (the participant confused the term with a Seat Base)
Task 4	Observation	Strategy: Edited the chair from Task 1
	Observation	The participant drew the chair he wanted to develop with ChairDNA
	Help	Indicate Seat Front and Back Rails (to unlock Seat Long Rail)
	Help	Align the Legs with the Seat (place Legs Spacing in 0)
	Bug (P)	Switched from Solid to Wireframe without clicking (every time the user changed Tab)
	Help	Indicate Seat Long Rail (and Spacing)
	Bug (P)	The Long Rails Number cannot be 1 (although a single rail can be obtained when 2 rails overlap in the centre) E.g.: Seat Long Rail
	Help	Indicate Back Splat
	Help	Back Splat Height (in this particular case) is linked to the midpoint of the Back
	Help	The Back 'curvature' can be obtained by curving the Seat Back
	Help	Irreproducible: curvature between Seat Long and Back Splat
	Help	It is unclear that, to obtain a curved Seat Outer Frame, the Leg Spacing needs to be 0
	Comment	Goal: Develop an idea which is in the designer's pipeline: a classroom chair (which is in standby to be developed)
	Comment	The participant used a tube of 19 (S33 has a tube of 22mm but it is cantilever; and the participant made a stool with 16mm)
	Help	The Stretcher Tilt Angle is not related to the Seat Tilt Angle (but can be manipulated)
	Error	Placed a Front Stretcher instead of Cross Stretcher
	Help	Indicate Cross Stretcher
	Comment	The chair has an upholstered Seat
	Help	Irreproducible: Align: the border of the Seat Panel with the border of the Seat Outer Frame
	Suggestion	Align options: Align the Back Splat to be placed backwards the Seat Panel
	Observation	The participant changed the colour of the Back Panel (in the Layer colour of Rhino)
	Help	Irreproducible: Add Rule: Back Cross (Top) Rail from the Back Splat
Questionnaire	Comment	[C3] Commands are not enough (see the comments made on irreproducible features)
	Comment	Script 3: The answers are ungrateful because they refer to a first use
	Comment	[C13] Random is not useful; because the participant would not reuse the resulting odd shapes When a software (Rhino) generates odd shapes, the participant usually saves the result but never uses it afterwards
	Comment	The participant would use ChairDNA to draw an idea that he has in his mind
	Comment	[C15] The name ChairDNA is appropriate because one can define templates that can be materialized in different forms, just like humans share the same DNA among their individual differences
	Comment	[D1] All programs limit decision making
	Comment	[D9] ChairDNA has the potential to be improved in order to overcome the Rhino gap in parametric modelling.
	Comment	[D15] The ChairDNA interface is little humanistic, as the names of the commands are very technical, directed towards engineering. E.g.: Rhino is more human; and SolidWorks is more technical.
	Comment	[D19] The applicability goal of ChairDNA is ambiguous, whether it is a drawing tool to the entire design process or it is a tool for the designer to create his own templates (the 'DNA') that will be subsequently developed in other programs. In the participant's opinion, ChairDNA should evolve to the detail stage, as otherwise it would always remain a support to other tools.
	Comment	The ChairDNA prototype is a basis for future developments; in the stage that it is now it is a little below expectations (not very accurate).

Table 7.15 Observation notes of P10

PART	TYPE	DESCRIPTION
Task 1	Comment	Design Process: ChairDNA guides are similar to the guides the participant uses in the beginning of the design process (in the side view) – see **Figure**
	Comment	The participant thought that only the Guides could be manipulated; then she realized a chair could be created
	Help	Percentages meaning: Front Leg spacing
	Suggestion	Units: replace relative values (percentages) by absolute values (millimetres and degrees)
	Comment	"Chair DNA is playful" *É divertido*
	Suggestion	Interface: Scroll wheel should be used to move sliders and to move down the scrollbar

	Help	How to do Orbit in Rhino
	Comment	ChairDNA has many parameters
	Suggestion	Interface: Display a different shaded area for each collapsible menu (e.g. to better distinguish the Front Leg from the Back Leg)
	Suggestion	Create relations: match the Back Leg with the Front Leg (by default, but could be a command that could used any time)
	Suggestion	Interface: Provide icons (together with a description)
	Help	Irreproducible: Leg Panels Height (with she later discovered that it could be done with Stretchers)
	Suggestion	Align options: Align the Leg Panels with the Legs (outside or the middle)
	Help	Change the display mode in Rhino (to Ghosted Viewport)
	Suggestion	Align options: Align the orientation of the Legs Section with the one of the Leg Radial Panel
	Help	Irreproducible: Manipulate the shape directly in the 3D model (by dragging points) The participant works in that way in parametric modelling (SolidWorks)
	Suggestion	Application: For industrial application, i.e., companies that manufacture large quantities of chairs, because slight changes on a design (e.g. to make a Child chair) could be quickly and easily done
	Suggestion	Commercial application: ChairDNA could be commercialized as a plug-in by a software company (as Sqédio, a Dassault Systèmes SolidWorks representative in Portugal, which develops customized plug-ins)
	Suggestion	Include predefined guides for different types of chairs (e.g. Stacking chair, Child chair): By configuring at the beginning the type of chair to be developed, it will restrict the problem
	Help	Indicate the Seat Panel (to "visualize in solid")
	Suggestion	Create a design competition for chairs developed with ChairDNA
	Help	Explain the meaning of Stretchers (that solve the issue of the Leg Panels Height)
	Help	ChairDNA no not have a Portuguese version (in Industry that would be useful)
	Comment	ChairDNA could be used by a person with no design expertise (e.g. machine operator, salesman)
	Comment	Absolute values are more suitable to a industry environment
	Help	Values can be edited directly in the Excel sheet
	Comment	ChairDNA becomes slower as parts are added
	Help	Indicate Save (confusion with the Rhino Save)
	Comment	Design Process: The participant does not structure thinking the way the program does, because her creative process is not the sum of parts, but this kind of thinking may make sense for other designers. Ex: the designer drew the profile and then drew the panels connecting the 2 profiles The designer thinks and draws directly in CAD; she thinks like SolidWorks
Task 2	Bug (P)	The effect of changing the thickness is only visible in Solid Mode
	Help	With above
	Help	How to do Orbit in Rhino (again)
	Help	Indicate Seat Radius
	Help	Indicate Seat Taper Width
	Help	Indicate Leg Taper Ratio
	Suggestion	Percentages issue: replace percentages by degrees (e.g. Legs Angles)
	Error	Placed Seat Radial Rail (and deleted)
	Error	Changed Stretchers Height to the opposite direction
	Help	Rhino: how to switch views
	Comment	Create relations: match Stretchers radius with Seat radius: The participant copied the values of the Seat Radius to the Stretchers Radius
	Suggestion	Align options: Align the Stretchers Outer Frame with the Legs (inside, outside, centre)
	Help	Indicate Stretchers Outer Frame
	Help	Irreproducible: Align the Stretchers Outer Frame with the Legs (again)
	Error	Edited the Back Width
	Help	To obtain a curved Back Outer Frame, the Back Width needs to be 50
	Help	To obtain a curved Back Outer Frame, the Back Leg Spacing needs to be 0
	Help	Percentages meaning: Leg spacing
	Help	Explain the meaning of Back Splat
	Error	Accidently deleted Back Cross Rail (and inserted)
	Help	Explain that the Back 'curvature' follows the Seat back curvature
	Comment	The lower classification of the task is justified by the fact that the result is still formally far away from the original
Task 3	Observation	The participant searched for the parameter of Leg Number
	Help	Changing the number of legs to 3
	Help	Indicate Save as (instead of Save)
Task 4	Observation	The test was paused (13h54-14h27)
	Observation	Strategy: The participant initially wanted to use a Template to save time, but opted to make the chair from scratch
	Suggestion	Align options: Align the Legs with the Seat
	Help	Indicate Leg Taper Ratio (again)
	Help	Indicate Seat Outer Frame (confusion with Stretchers)
	Help	Irreproducible: Align the Seat Outer Frame with the Legs (inside)
	Bug (E)	The joints of Seat Outer Frame are out of place (when Seat Outer Frame is connecting the Legs)
	Bug (P)	The leg extensions create duplicated lines in legs (e.g. Back Upright from Back Leg)
	Observation	Interruption (phone call to the participant: 0:10:30-0:17:20, duration 7min)
	Help	Irreproducible: a Back Cross Rail in the front of Back Upright (Back Panel would do but not with the dimensions she wanted)
	Bug (P)	The Back Panel is not aligning outside the Back Upright
	Help	Indicate Back Cross Rail and Back Top Rail

	☑ Suggestion	The Back Top and Cross Rail sections should follow the Back Angle
	? Help	Irreproducible: Align: the Seat Inner Frame above the Seat Outer Frame (or a Seat Panel composed of slats)
	✍ Comment	Irreproducible: Align Side Stretcher inside of the Legs (again)
	? Help	Indicate Stretchers Height (to change Side Stretchers Height)
	✍ Comment	The lower classification of the task is justified by the fact that the participant was not able to reproduce what she wanted
	✍ Comment	Random command is amusing, "different from anything I see"; and some can provide ideas E.g. The participant got interested in the conjugation of panels of Random 2
Questionnaire	✍ Comment	ChairDNA lacks detail definitions (because many chairs have been designed, the differentiation relies in detail)
	✍ Comment	[B1] ChairDNA lacks manual side, as it is fragmented (note that any software is always a little bit fragmented) *Falta de manualidade*
	✍ Comment	[B4] Goal (Task 4): Develop an idea which is in the designer's pipeline: a DIY readymade wooden board chair (that the participant had in mind some time ago)
	✍ Comment	[C3] Justification: Missing commands to align parts
	✍ Comment	[C8] Justification: The participant could not reproduce many features
	✍ Comment	[C10] Justification: The program is very slow (considering the basic functions that it performs)
	✍ Comment	[C13] There are a lot of Random designs that cannot be usable
	✍ Comment	[C15] The name ChairDNA seems very romanticized for something so practical *Nome parece muito romantizado para uma coisa tão prática*
	☑ Suggestion	ChairDNA could include the catalogue of several suppliers (and thus obtain sponsorships)
	✍ Comment	[D13, Production] ChairDNA is be more suitable to some types of production (as carpentry, because it relies in the sum of parts) than others (as tubular metal furniture, Cut Furniture). The generated design is almost a code, and that would be suitable to share with every intervenient related to the manufacturing (commercials, engineers and producers)
	✍ Comment	[D19] Application: ChairDNA should focus on industry needs, because software for chair designers is a wide universe.
	✍ Comment	ChairDNA is not very helpful in the process of the freedom of conception of the designer

Appendix 7.B.11 Pre-test Interview Statistics

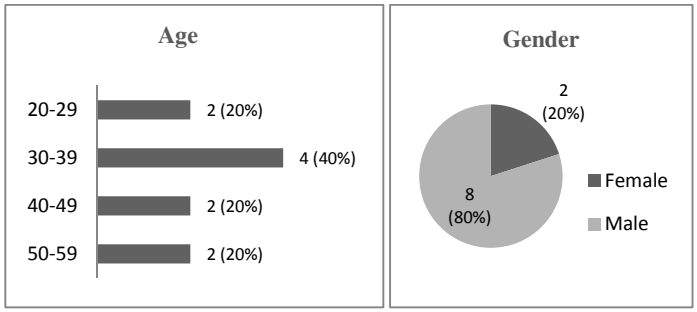


Fig. 7.62 Statistics of A2, A3

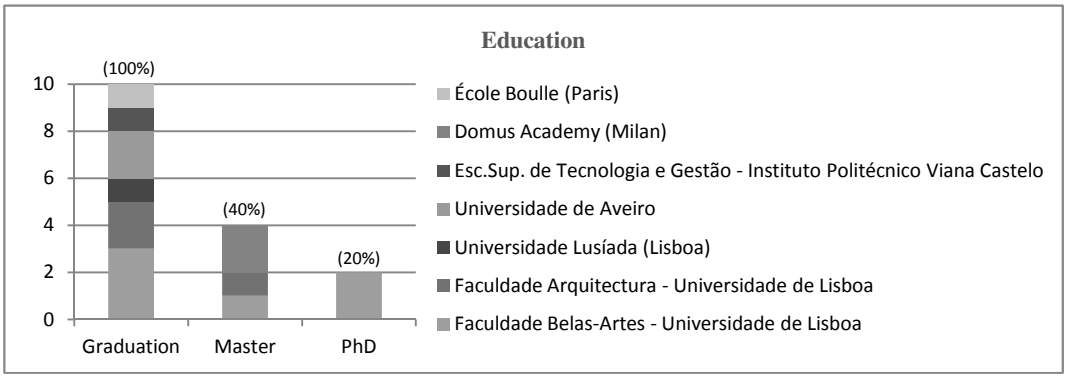


Fig. 7.63 Statistics of A4, A5

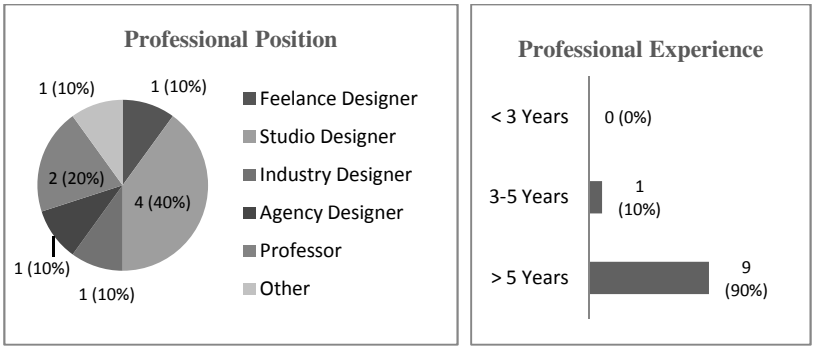


Fig. 7.64 Statistics of A6, A7

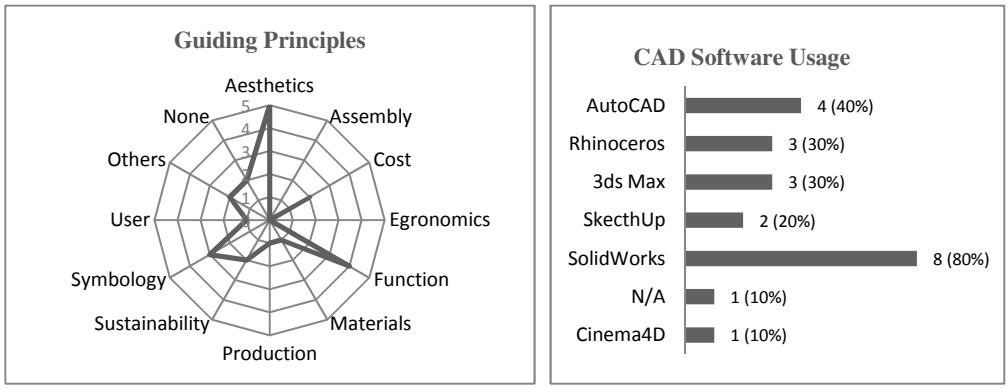


Fig. 7.65 Statistics of A8

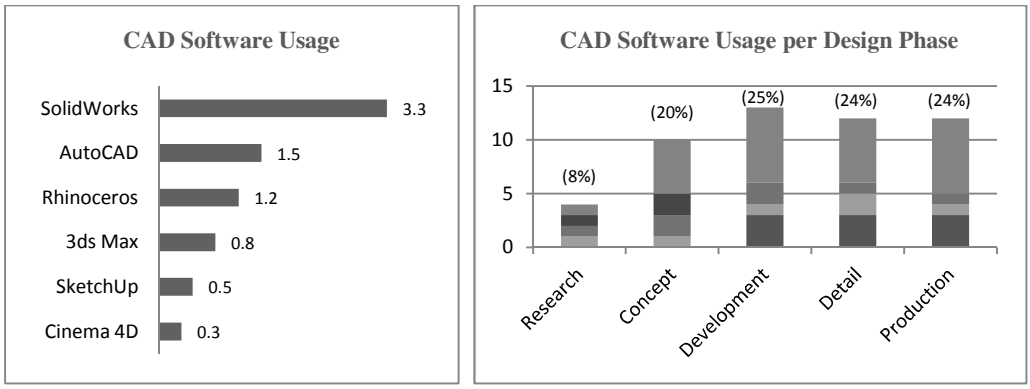


Fig. 7.66 Statistics of A9, A10

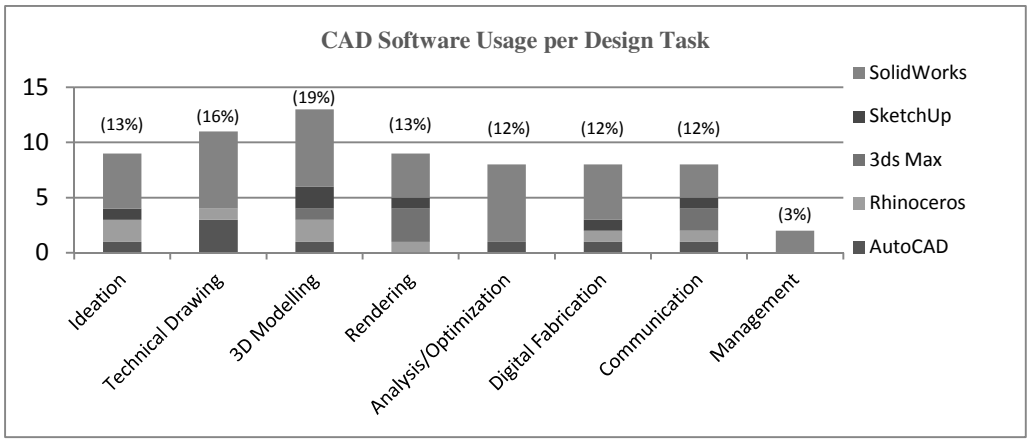


Fig. 7.67 Statistics of A11

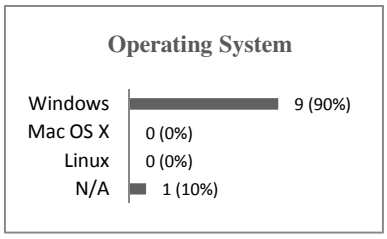


Fig. 7.68 Statistics of A12

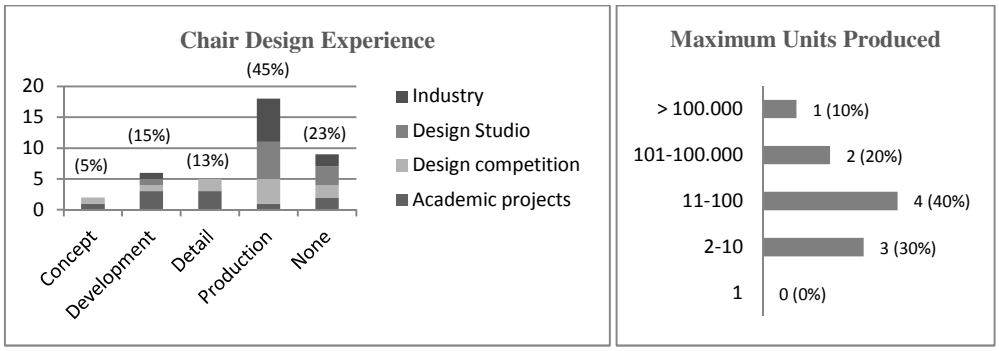


Fig. 7.69 Statistics of A13, A14

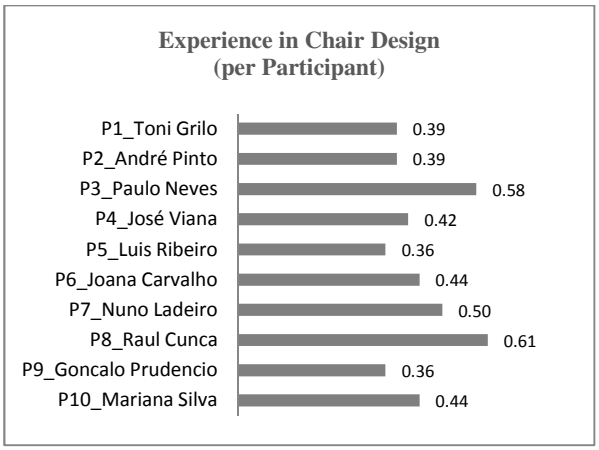


Fig. 7.70 Statistics of A13/A14

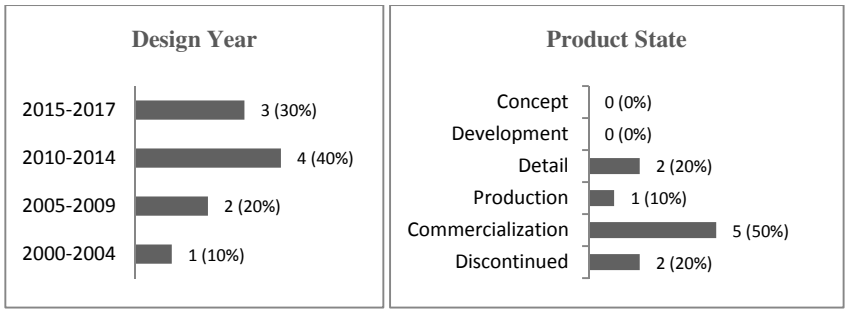


Fig. 7.71 Statistics of PA2, PA3

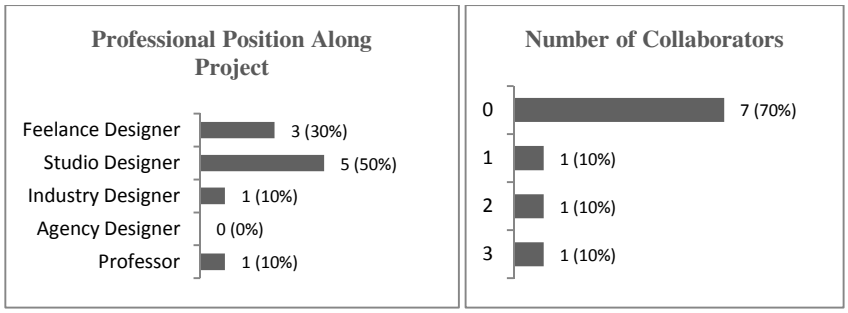


Fig. 7.72 Statistics of PA5, PA6

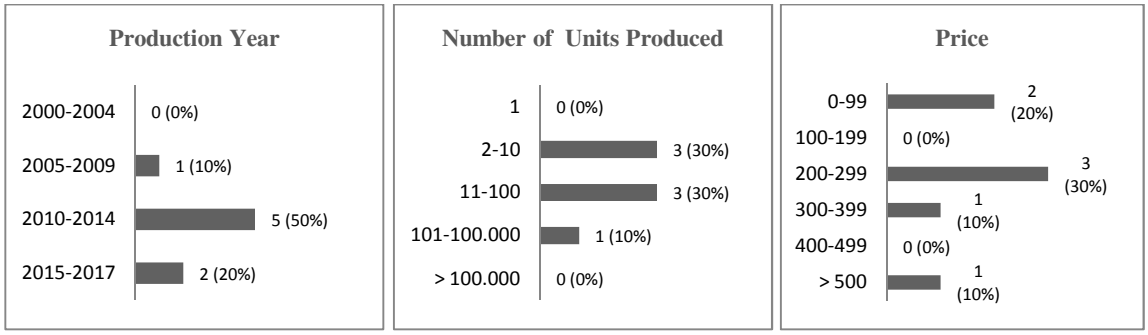


Fig. 7.73 Statistics of PA7, PA8

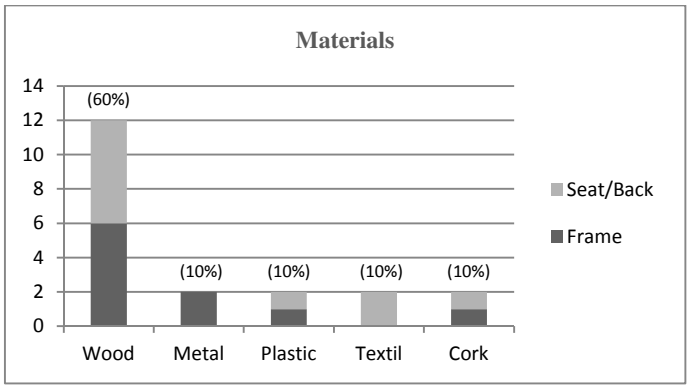


Fig. 7.74 Statistics of PA9

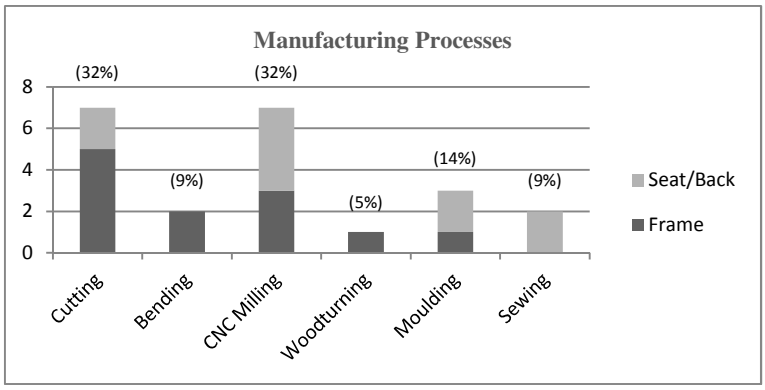


Fig. 7.75 Statistics of PA10

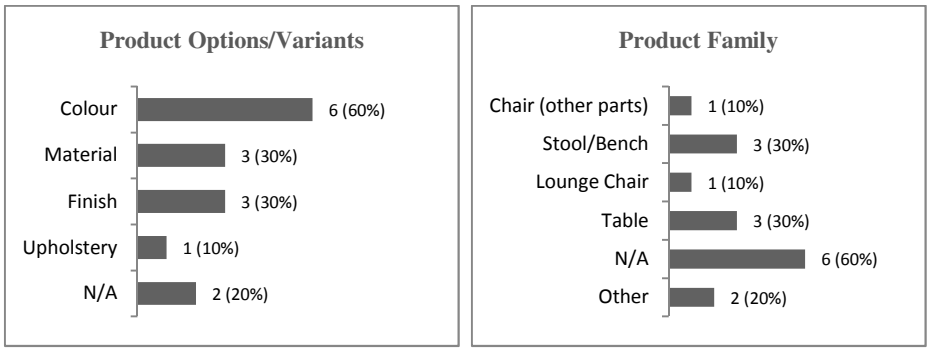


Fig. 7.76 Statistics of PA11, PA12

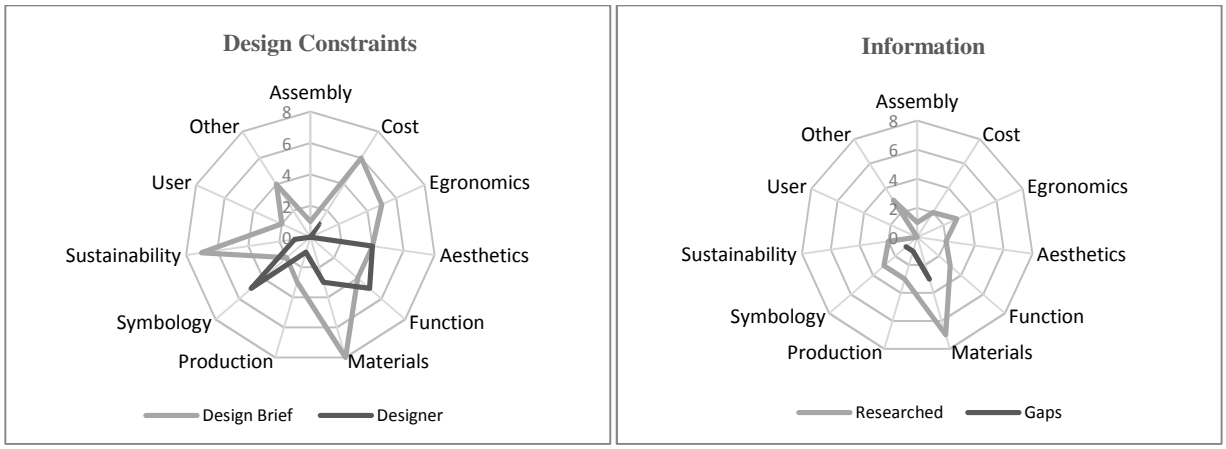


Fig. 7.77 Statistics of PB1/PB3, PB4/PB5

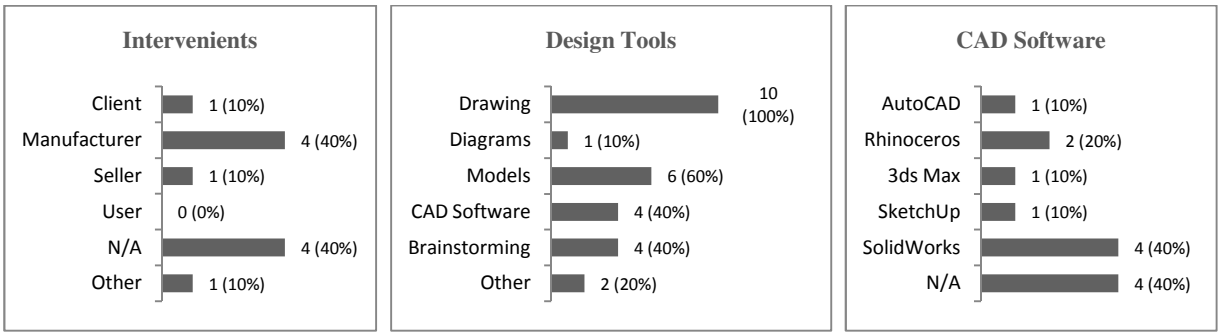


Fig. 7.78 Statistics of PB2, PB6, PB7

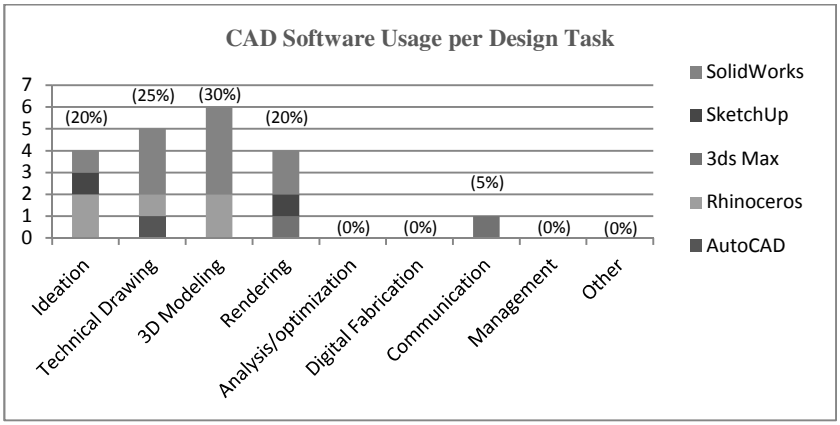


Fig. 7.79 Statistics of PB8

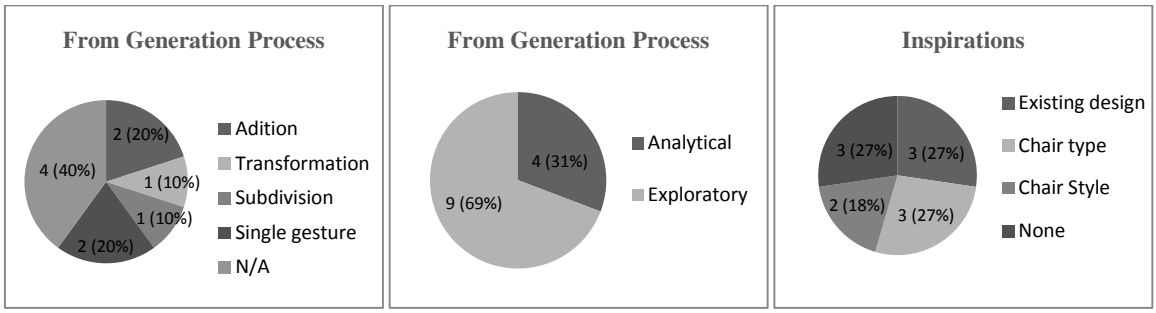


Fig. 7.80 Statistics of PB9, PB10, PB11

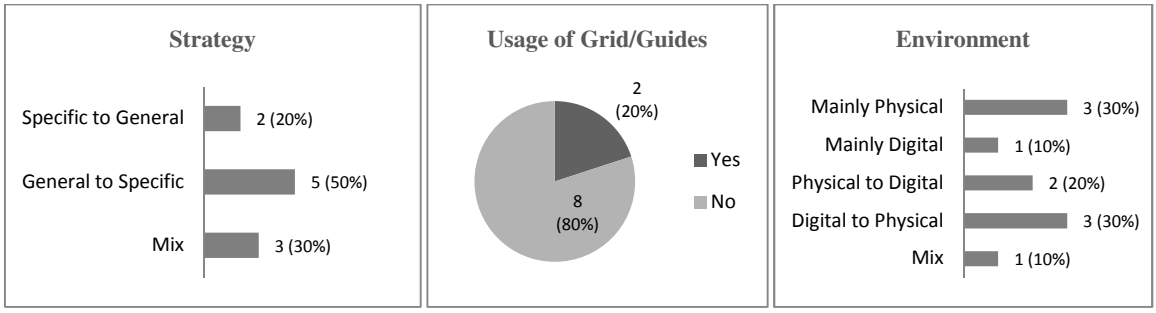


Fig. 7.81 Statistics of PB12, PB13, PB14

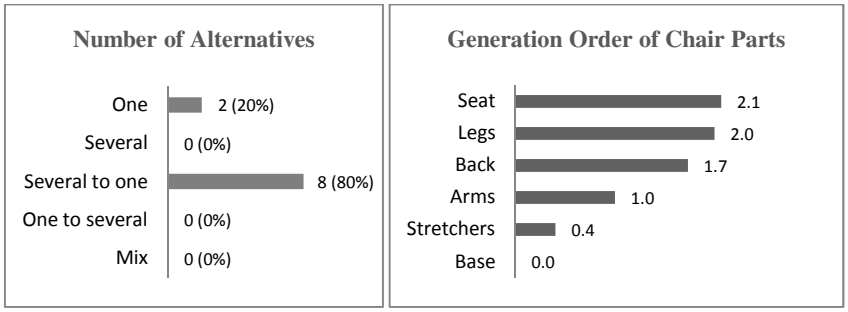


Fig. 7.82 Statistics of PB15, PB16

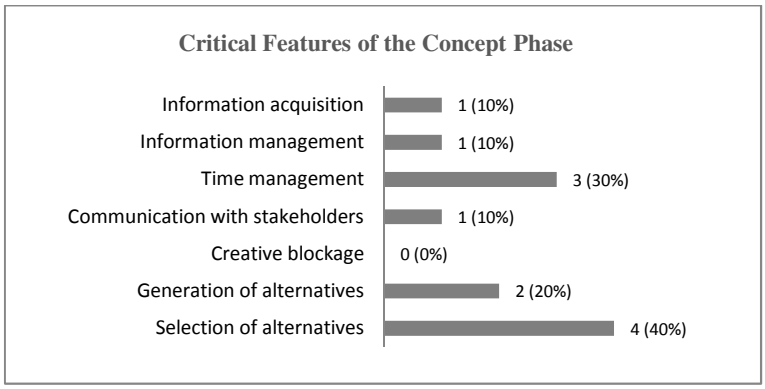


Fig. 7.83 Statistics of PB17

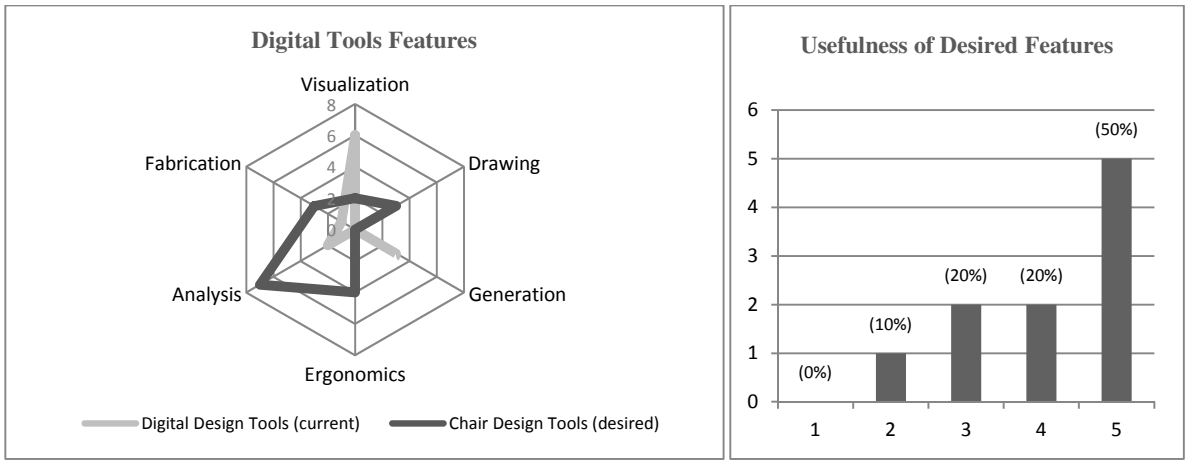


Fig. 7.84 Statistics of E1/E2, E3

Appendix 7.B.12 User Test Statistics

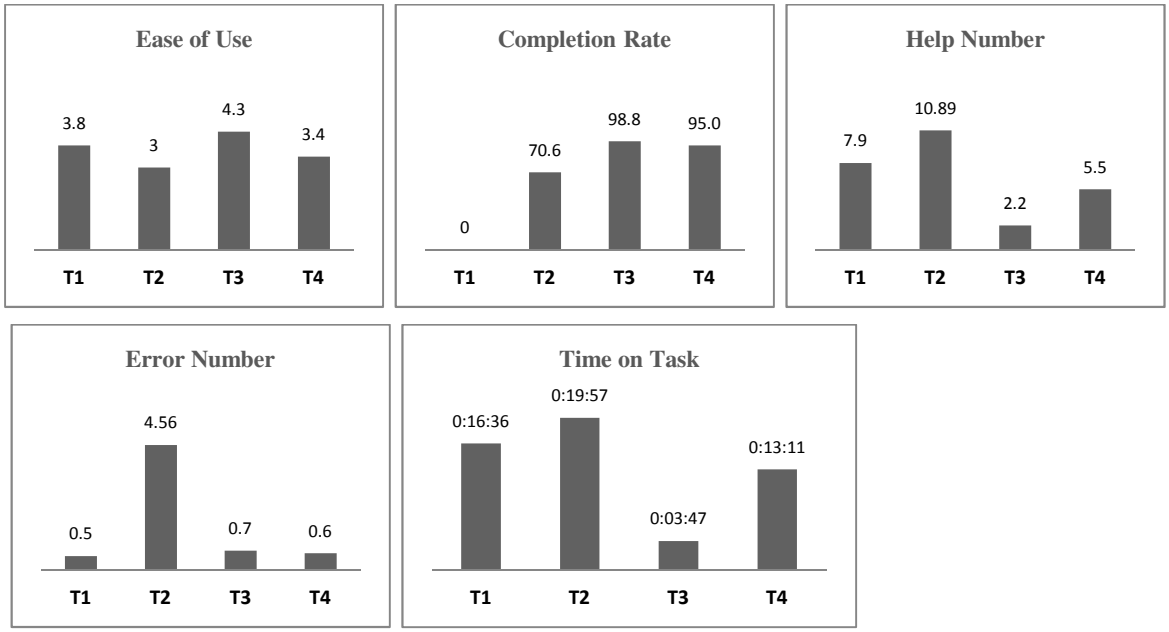


Fig. 7.85 Usability metrics

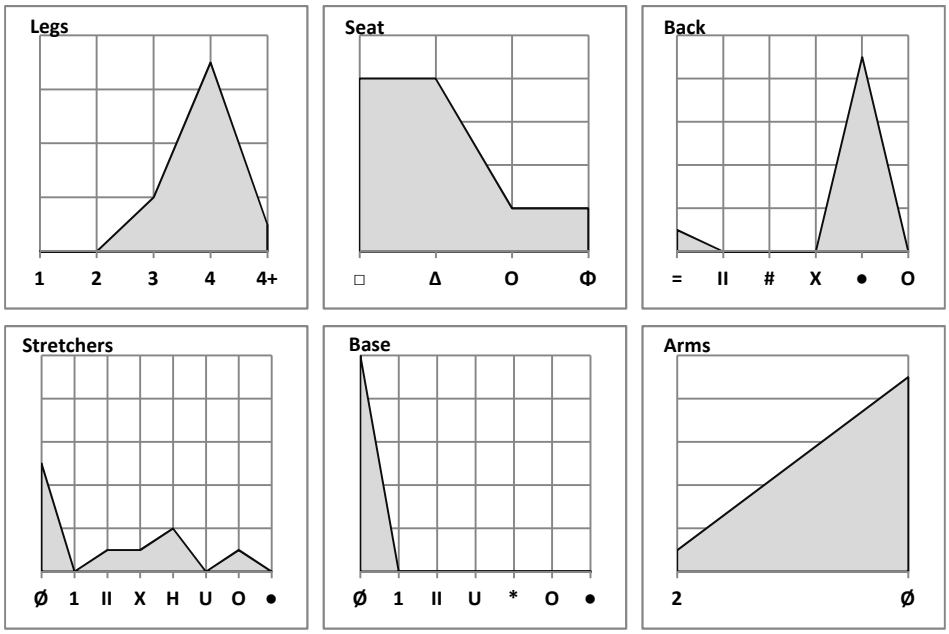
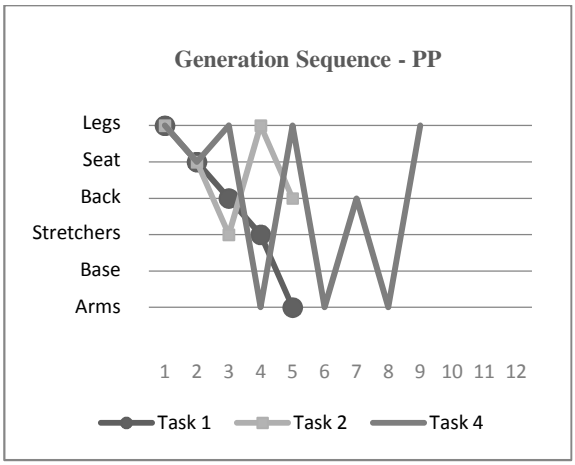
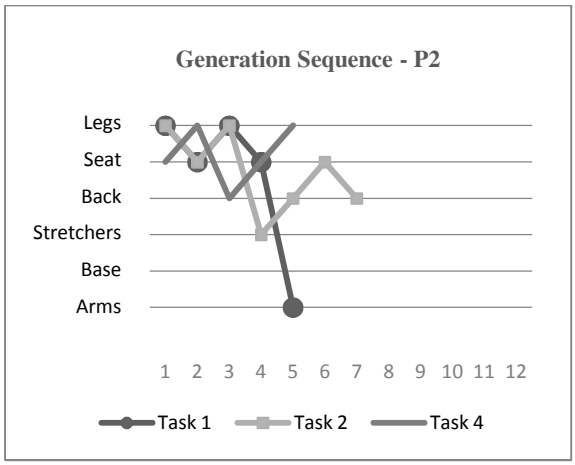
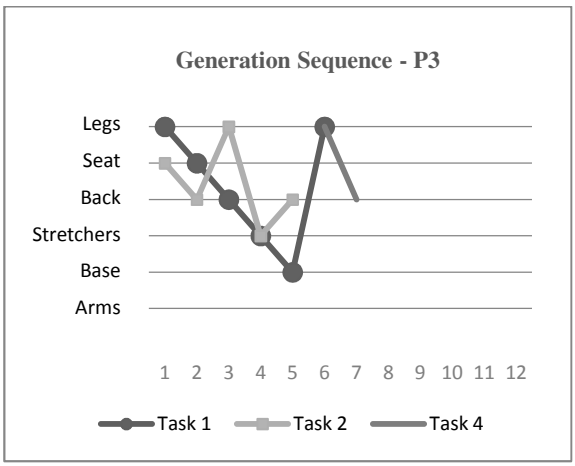
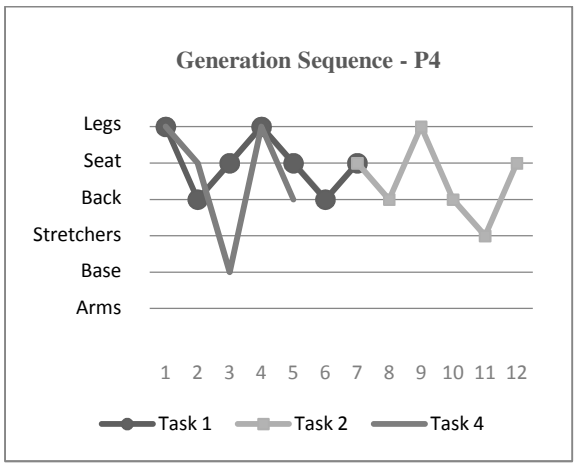


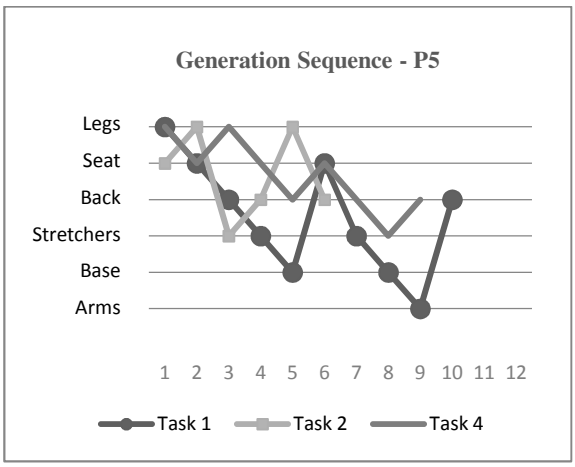
Fig. 7.86 Task 4 solutions per chair types

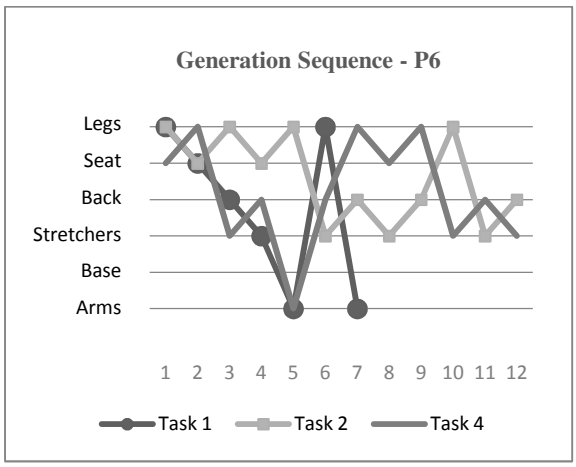

Generation Sequence - PP
Legs
Seat
Back
Stretchers
Base
Arms
1 2 3 4 5 6 7 8 9 10 11 12
Task 1
Task 2
Task 4


Generation Sequence - P2
Legs
Seat
Back
Stretchers
Base
Arms
1 2 3 4 5 6 7 8 9 10 11 12
Task 1
Task 2
Task 4


Generation Sequence - P3
Legs
Seat
Back
Stretchers
Base
Arms
1 2 3 4 5 6 7 8 9 10 11 12
Task 1
Task 2
Task 4


Generation Sequence - P4
Legs
Seat
Back
Stretchers
Base
Arms
1 2 3 4 5 6 7 8 9 10 11 12
Task 1
Task 2
Task 4


Generation Sequence - P5
Legs
Seat
Back
Stretchers
Base
Arms
1 2 3 4 5 6 7 8 9 10 11 12
Task 1
Task 2
Task 4


Generation Sequence - P6
Legs
Seat
Back
Stretchers
Base
Arms
1 2 3 4 5 6 7 8 9 10 11 12
Task 1
Task 2
Task 4

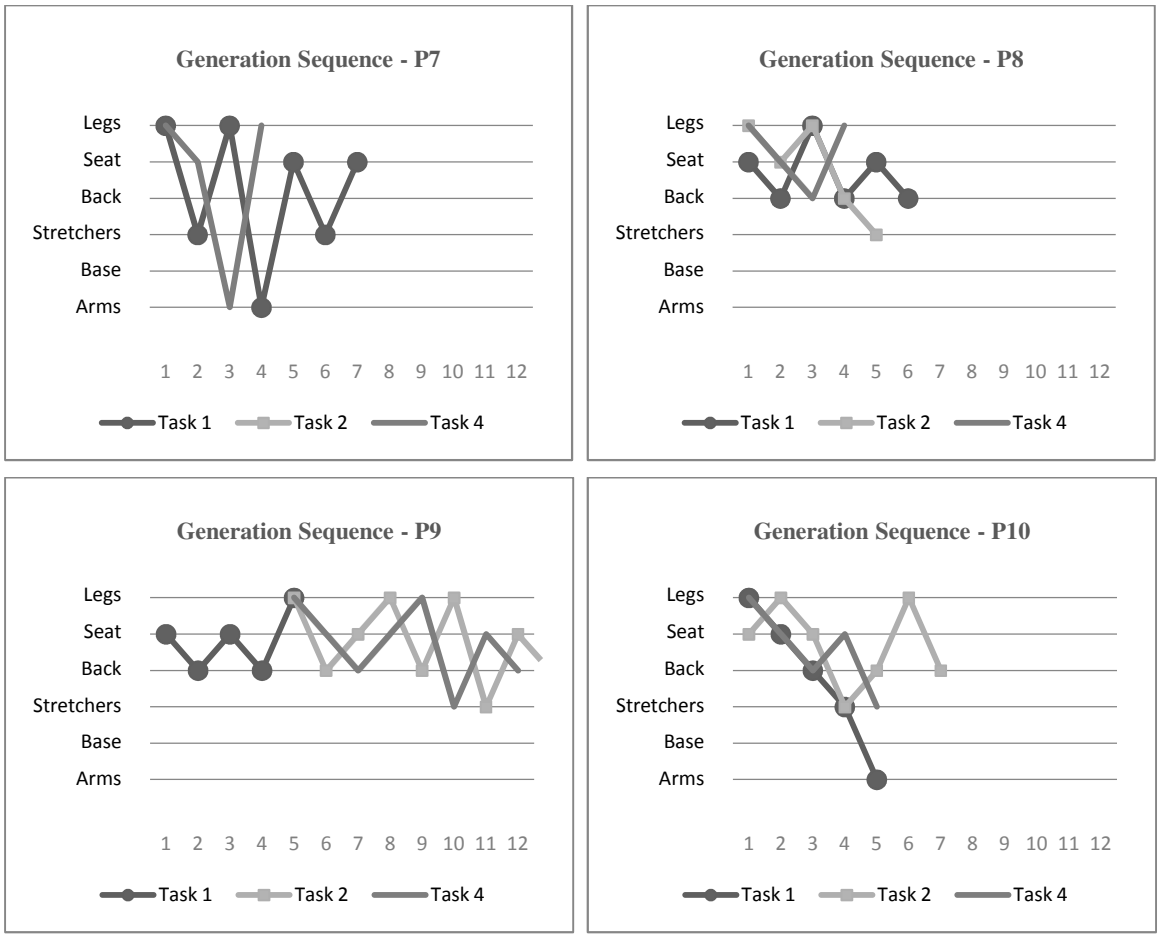


Fig. 7.87 Generation sequence (per participant)

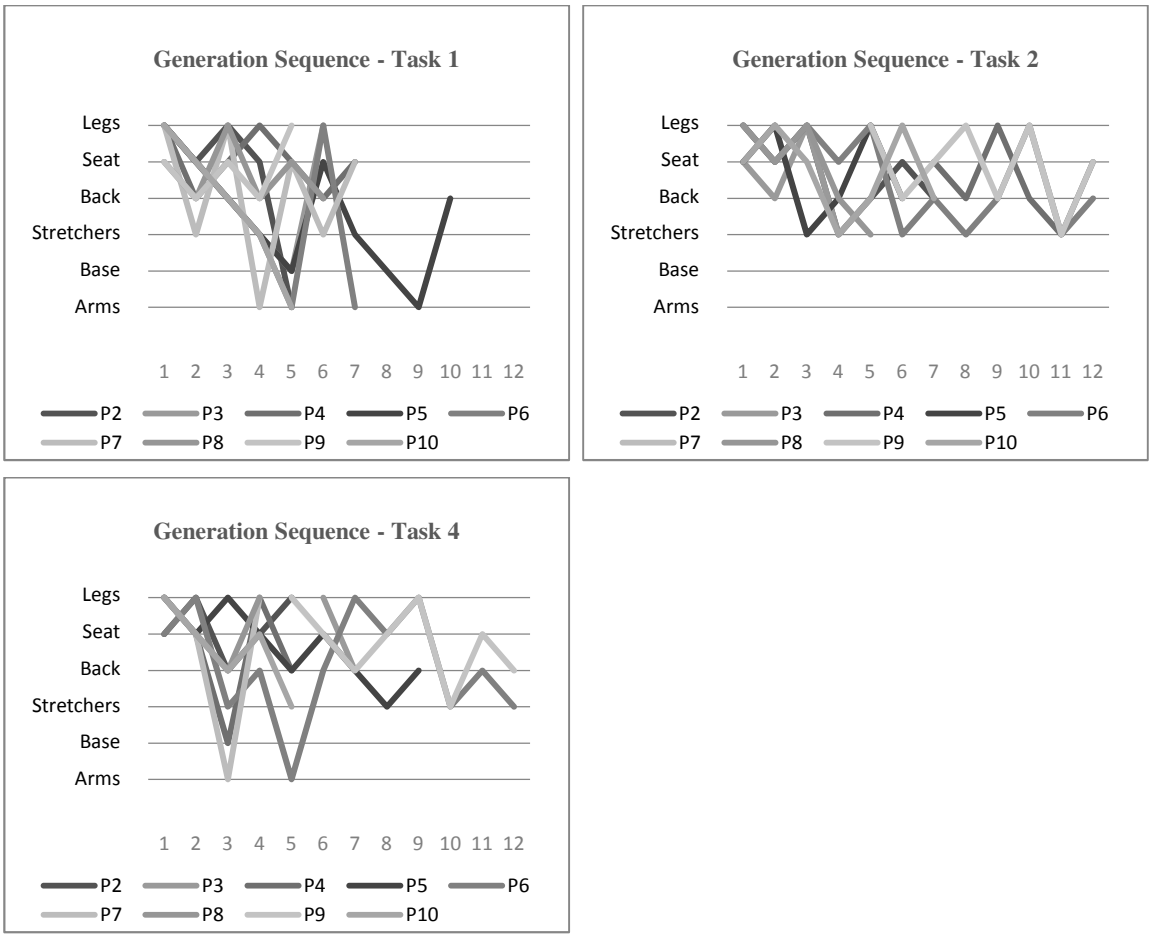


Fig. 7.88 Generation sequence (per task)

Appendix 7.B.13 Post-test Questionnaire Statistics

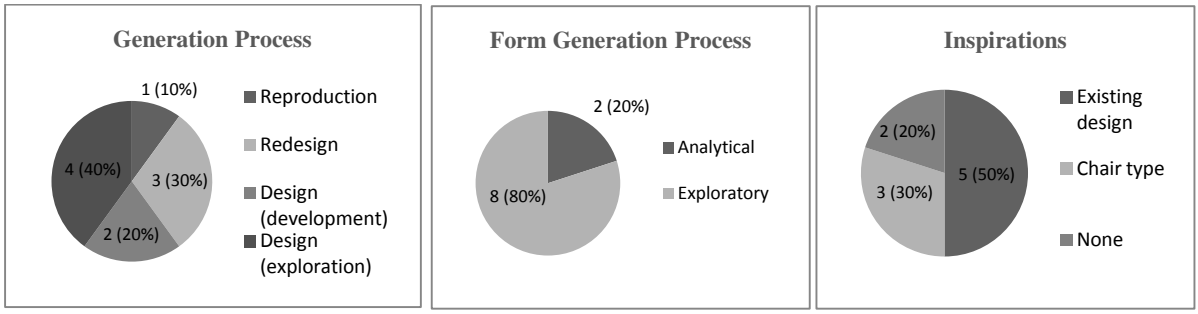


Fig. 7.89 Statistics of B1, B2, B3

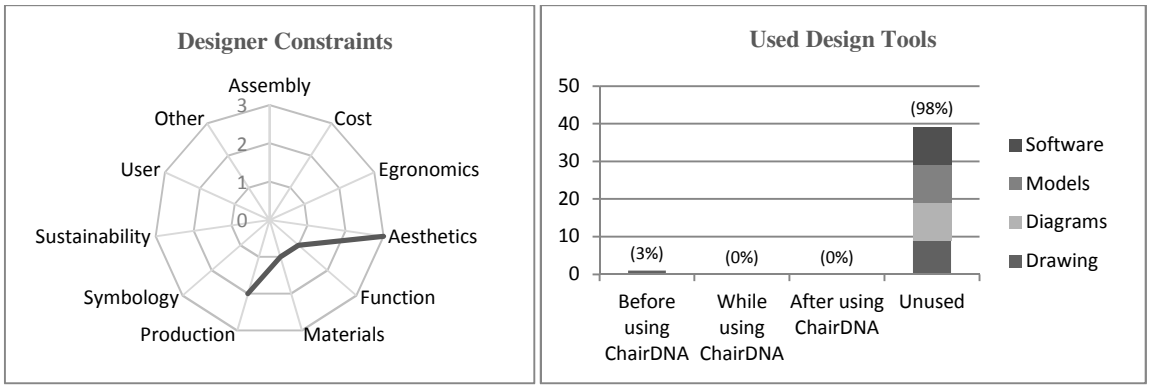


Fig. 7.90 Statistics of B4, B5

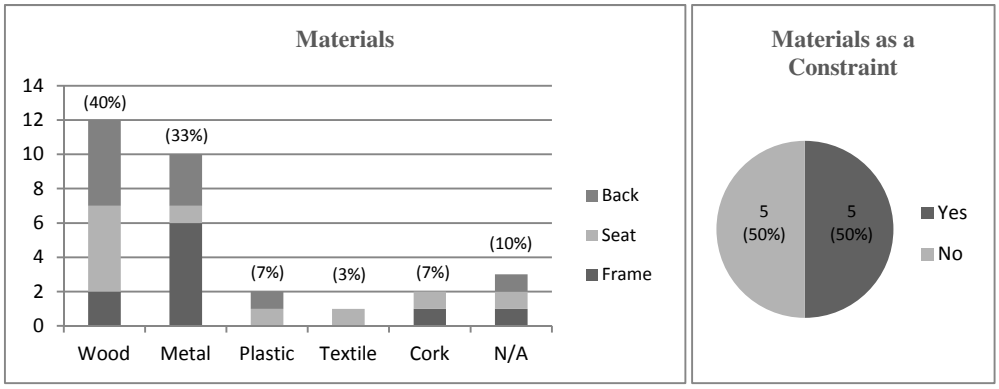


Fig. 7.91 Statistics of B6, B7

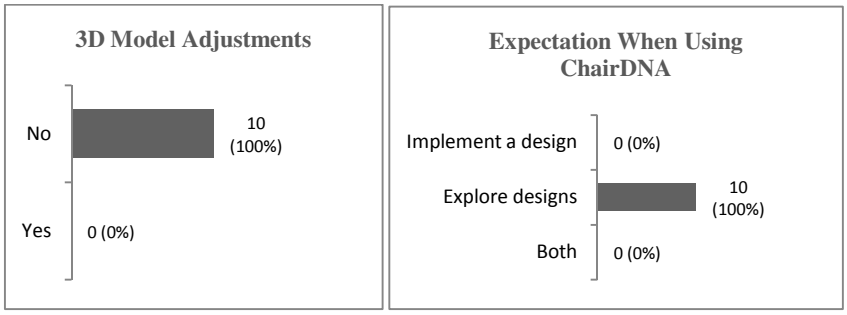


Fig. 7.92 Statistics of B8, B10

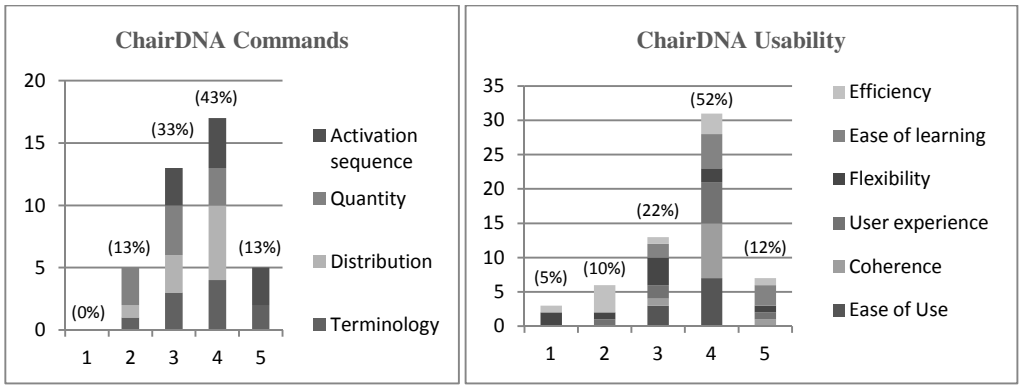


Fig. 7.93 Statistics of C1-C4, C5-C10

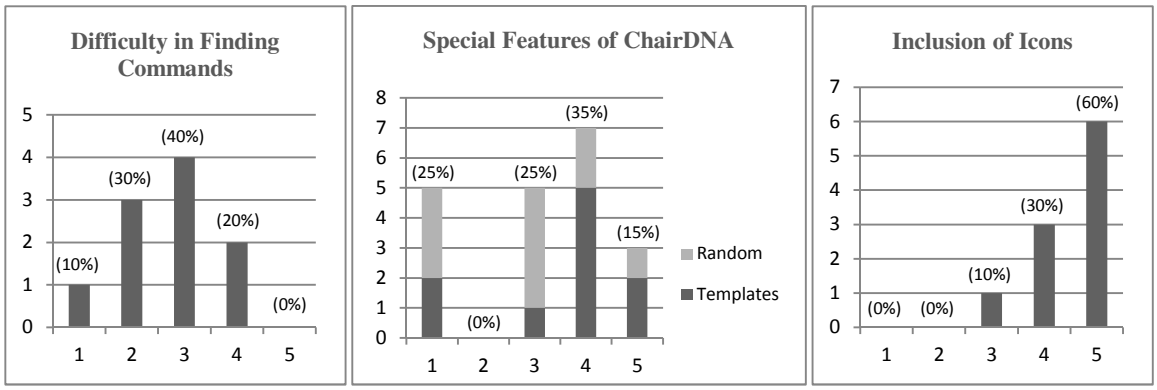


Fig. 7.94 Statistics of C11, C12/C13, C14

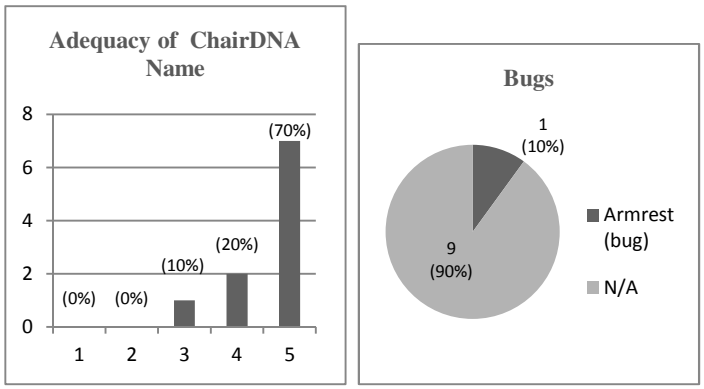


Fig. 7.95 Statistics of C15, C16

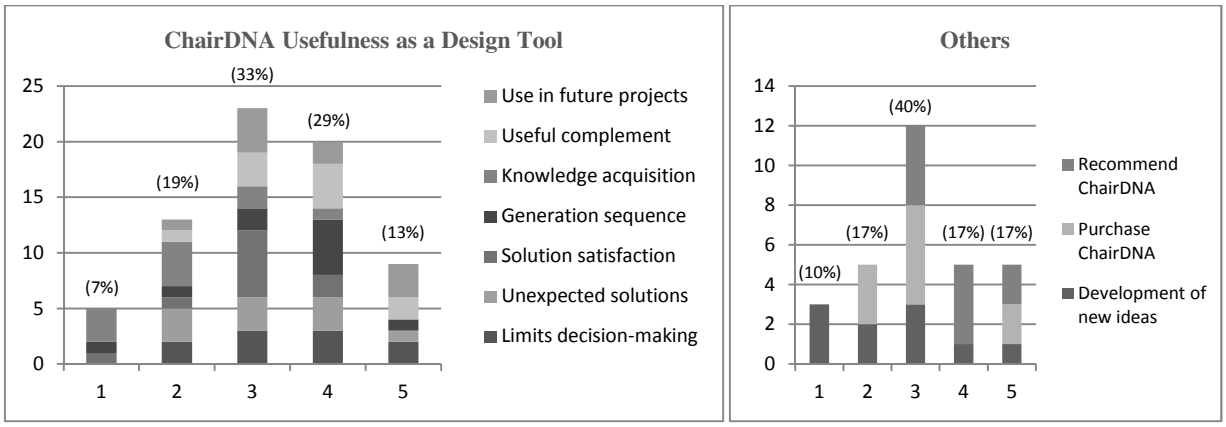


Fig. 7.96 Statistics of D1-D6 & D8, D7 & D9/D10

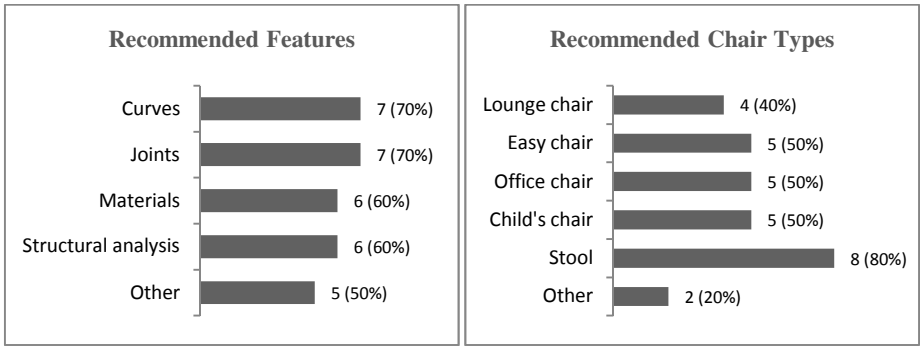


Fig. 7.97 Statistics of D11, D12

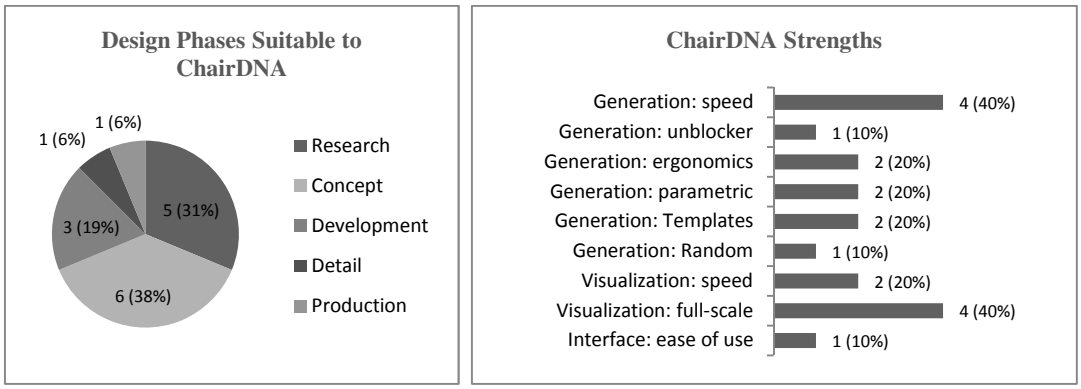


Fig. 7.98 Statistics of D13, D14/D15

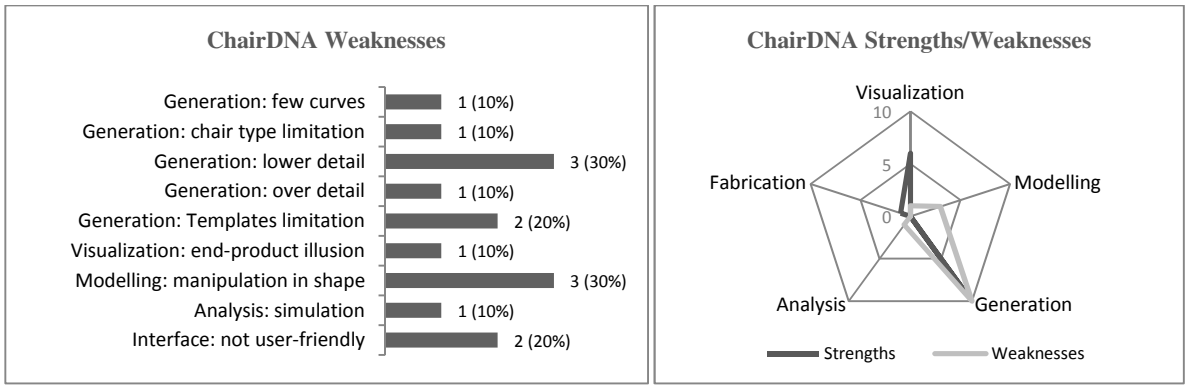


Fig. 7.99 Statistics of D16/D17, D14-D17

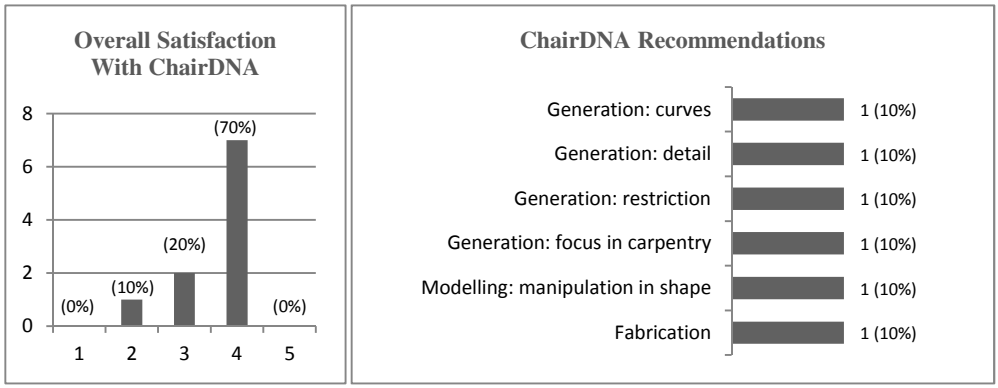


Fig. 7.100 Statistics of D18, D19

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