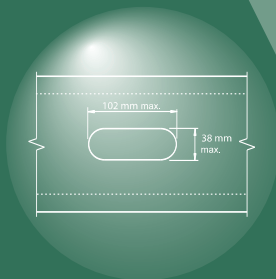
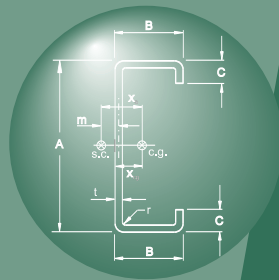
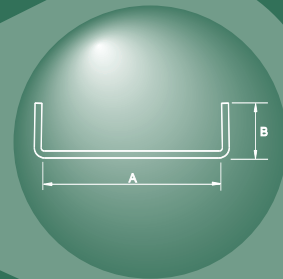


LIGHTWEIGHT STEEL FRAMING

METRIC SECTION PROPERTIES

wall stud
floor joist
& track



section
properties
tables

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PREFACE

The material presented in this publication has been prepared for the general information of the reader. While the material is believed to be technically correct and in accordance with recognized good practice at the time of publication, it should not be used without first securing competent advice with respect to its suitability for any specific application. Neither the *Canadian Sheet Steel Building Institute* nor its Members warrant or assume liability for the suitability of the material for any general or particular use.

LIGHTWEIGHT STEEL FRAMING METRIC SECTION PROPERTIES

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COMMENTARY

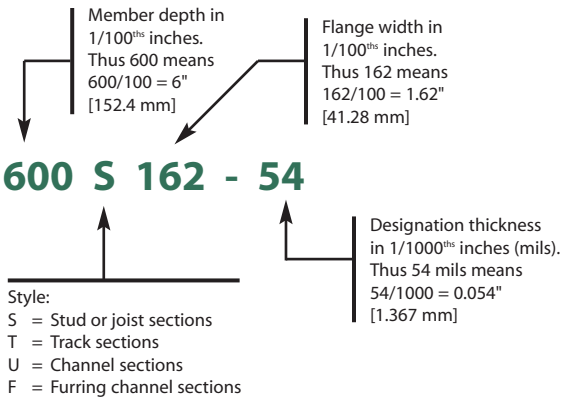
1. INTRODUCTION

The technical data in this report is intended as an aid to the design professional and should not be used to replace the judgement of a qualified Engineer or Architect.

2. SECTION GEOMETRIES

2.1 The cold-formed steel framing manufacturers use a universal designator system for their products. The designator is a four-part code which identifies depth, flange width, member type and material thickness. The numeric descriptors are based on Imperial units, however the same designator is used to describe either SI Metric or Imperial products.

Example: 600S162-54



Notes:

1. *Material thickness is given as the minimum thickness exclusive of coatings and represents 95% of the design thickness. See CAN/CSA-S136-01, Section A2.4. Designation thickness is the nominal minimum thickness used for product identification.*
2. *The yield strength used in design, if greater than 230 MPa, needs to be identified. For example, a 41.3 x 152 mm stud with a design thickness of 1.438 mm and a design yield strength of 345 MPa would be designated as: 600S162-54 (345 MPa). Note that if the (345 MPa) is omitted then 230 MPa is assumed.*
3. *For track, "T", sections, depth is a nominal inside to inside dimension. Other dimensions are out to out.*

2.2 Stud and joist lip lengths are as follows

Section	Flange Width (mm)	Lip Length (mm)
S125	31.75	4.775
S162	41.28	12.70
S200	50.80	15.88
S250	63.50	19.05
S300	76.20	19.05

2.3 Stud, Joist and Track Inside Corner Radii

For stud, joist and track, the inside corner radius equals the maximum of $(2.381 - t/2)$ or $1.5t$ where t = thickness exclusive of coating in millimetres. The resulting radii are provided in the following table:

Design Thickness (mm)	Inside Radius (mm)
0.879	1.942
1.146	1.808
1.438	2.157
1.811	2.717
2.583	3.875

3. STUD AND JOIST SECTION PROPERTY TABLES

3.1 Structural properties are computed in accordance with CSA Standard CAN/CSA-S136-01, North American Specification for the Design of Cold-Formed Steel Structural Members.

3.2 Steel shall meet the requirements of CAN/CSA-S136-01 with a minimum yield strength of 230 MPa for design thicknesses less than or equal to 1.146 mm and 345 MPa for design thicknesses greater than or equal to 1.438 mm.

3.3 Section properties are computed on the basis of the design thicknesses shown in the tables. Design thicknesses are exclusive of coating.

3.4 Perforations are assumed to be located at mid-depth and spaced at a minimum of 610 mm o.c. The distance from the centreline of the last perforation to the end of a wall stud or joist is assumed to be 305 mm minimum.

- 3.5** The fully braced factored moment resistances, M_{rx} and M_{ry} are derived using effective section properties. The increase in yield from the cold work of forming has been conservatively neglected.
- 3.6** The maximum unbraced length, L_u , which precludes lateral buckling in beams is calculated from the formulae in the Commentary on North American Specification for the Design of Cold-Formed Steel Structural Members, 2001 Edition, published by the American Iron and Steel Institute (Formulae C-C3.1.2.1-11, C-C3.1.2.1-12 & C-C3.1.2.1-14). K_y , K_t and C_b are set equal to one.
- 3.7** Factored resistances include the following phi factors:
 Moment $\phi_b = 0.90$
 Shear $\phi_v = 0.80$
 Web Crippling See Item 3.9
- 3.8** The deflection inertia, I_x , includes the effects of local buckling at the stress level resulting from specified live loads (approximated by $0.6 \times F_y$). This inertia is only appropriate for checking serviceability limit states.
- 3.9** Web Crippling

3.9.1 Wall Studs

No specific provisions are currently included in CAN/CSA-S136-01 for the design of steel stud flexural members with stud to track connections susceptible to web crippling. However, these web crippling provisions are provided in the Standard for Cold-Formed Steel Framing Wall Stud Design, American Iron and Steel Institute (*pre-publication final draft*) and have been adopted herein where they apply.

The revised web crippling coefficients are as follows:

$$\begin{aligned} C &= 3.72 \\ C_R &= 0.19 \\ C_N &= 0.74 \\ C_h &= 0.019 \\ \phi_w &= 0.76 \end{aligned}$$

The 0.76 phi factor was derived specifically for this project and is based on the methodology provided in the Commentary on North American Specification for the Design of Cold-Formed Steel Structural Members, 2001 Edition.

The limits of applicability are as follows:

- i) Stud design thickness 0.838 to 1.85 mm
- ii) Stud design yield strength 230 MPa to 345 MPa
- iii) Stud nominal depth 88.9 mm to 152 mm
- iv) Track thickness equal to or greater than the stud thickness
- v) Both flanges of the stud attached to the track
- vi) Studs not adjacent to wall openings

For studs with design thicknesses greater than 1.85 mm or depths greater than 152 mm, the web crippling provision for CAN/CSA-S136-01 are assumed to apply. The end one-flange loading fastened to support condition (Table C3.4.1-2) is used with a 0.75 resistance factor, ϕ_w .

For both approaches to web crippling, an unperforated section with 25.4 mm bearing length is assumed.

3.9.2 Joists

Web crippling capacities are based on the provisions of CAN/CSA-S136-01 with the end one-flange loading fastened to support condition (Table C3.4.1-2) and a 0.75 resistance factor, ϕ_w . A 76.2 mm bearing length is assumed.

4. TRACK SECTION PROPERTY TABLES

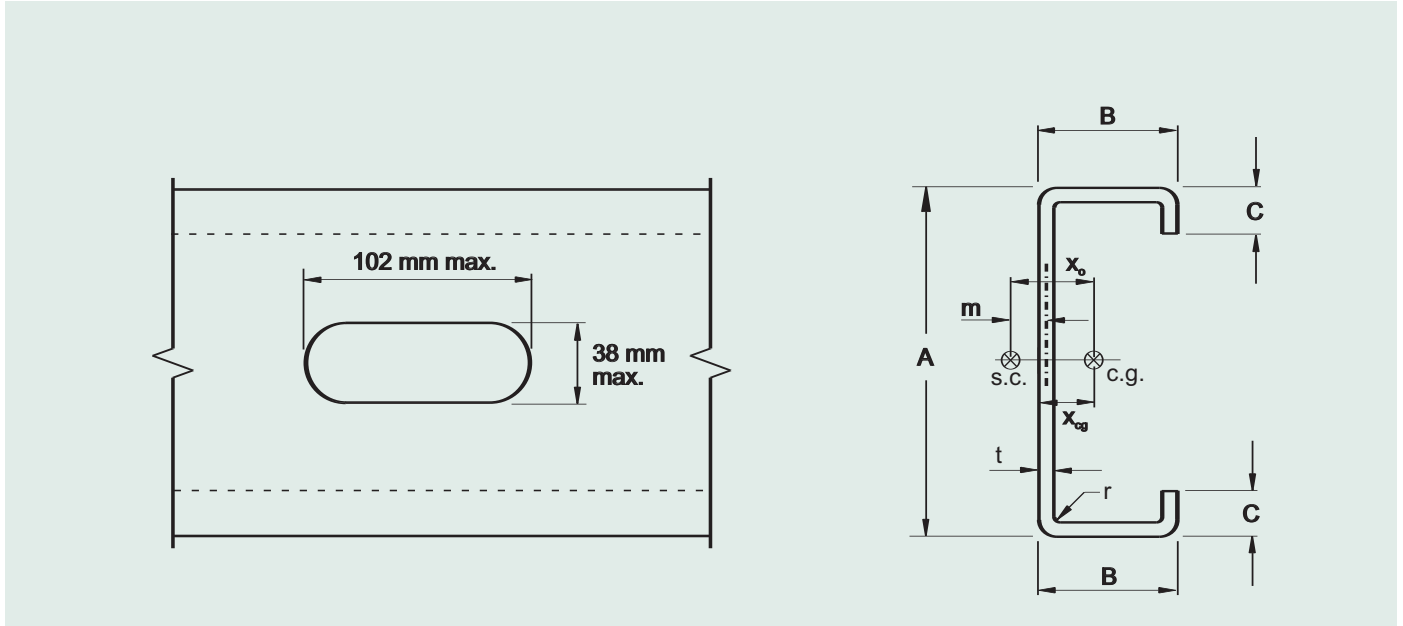
- 4.1 The previous Commentary Items 3.1 - 3.3 apply.
- 4.2 The factored moment resistance, M_{rx} , is derived using effective section properties with the cold work of forming conservatively neglected. Factored shear and moment resistances, V_r and M_{rx} , include a 0.8 and 0.9 resistance factor respectively.
- 4.3 The deflection inertia, I_x , includes the effects of local buckling at the stress level resulting from specified live loads (approximated by $0.6 \times F_y$). This inertia is only appropriate for checking serviceability limit states.

5. SYMBOLS

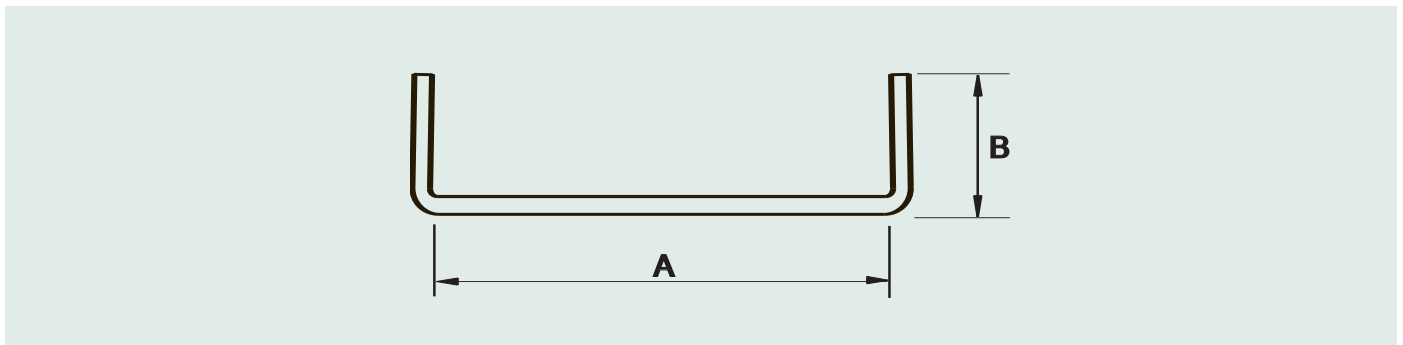
A	= out to out depth of stud (mm) = nominal depth of track (mm)	S_f	= fully effective (unreduced for local buckling) section modulus (mm^3)
AREA	= fully effective (unreduced for local buckling) area (mm^2)	t	= design steel thickness exclusive of coating (mm)
B	= out to out width of flange (mm)	V_r	= factored shear resistance (kN)
C	= out to out depth of lip stiffener (mm)	Weight	= weight per foot based on uncoated, unperforated steel (kg/m)
C_w	= warping torsional constant (mm^6)	X_{cg}	= distance to centroid from back of web for the fully effective section (unreduced for local buckling) (mm)
F_y	= minimum yield strength (MPa)	x_o	= distance from shear centre to centroid (mm)
I_x	= fully effective (unreduced for local buckling) moment of inertia about the major axis (mm^4)		
$I_{x(\text{Deflec})}$	= effective moment of inertia about the major axis for checking deflections with specified (unfactored) loads (mm^4)		
I_y	= fully effective (unreduced for local buckling) moment of inertia about the minor axis (mm^4)		
J	= St. Venant torsional constant (mm^4)		
j	= torsional-flexural buckling parameter for singly symmetric beam-columns (mm)		
m	= distance from centreline web to the shear centre (mm)		
M_{rx}	= fully braced factored moment resistance about the major axis (kN.m)		
M_{ry}	= fully braced factored moment resistance about the minor axis with the web in compression or with the lips in compression (kN.m)		
L_u	= maximum unbraced length of flexural members which precludes lateral buckling (mm)		
P_r	= factored web crippling resistance (kN)		
r	= inside bend radius (mm)		
r_x	= fully effective (unreduced for local buckling) radius of gyration about the major axis (mm)		
r_y	= fully effective (unreduced for local buckling) radius of gyration about the minor axis (mm)		

STUD, JOIST AND TRACK SECTION PROPERTY TABLES

Wall Stud and Joist Section Dimensions



Track Section Dimensions



Wall Stud Section Properties

Stud Designation	DIMENSIONS				UNPERFORATED PROPERTIES											
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)	Lip C (mm)	Weight (kg/m)	Yield F_y (MPa)	Area (mm ²)	x_{cg} (mm)	m (mm)	x_o (mm)	C_w (mm ⁶ x10 ⁶)	J (mm ⁴)	j (mm)	r_x (mm)	r_y (mm)	
350S125-33	0.879	88.90	31.75	4.775	1.07	230	135	7.95	12.3	19.8	23.4	35.0	51.8	34.5	10.6	
350S125-43	1.146	88.90	31.75	4.775	1.38	230	175	7.95	12.2	19.5	29.3	77.0	51.8	34.3	10.4	
350S125-54	1.438	88.90	31.75	4.775	1.71	345	217	7.92	12.0	19.2	35.2	150	52.6	34.0	10.2	
350S162-33	0.879	88.90	41.28	12.70	1.31	230	166	13.9	20.2	33.5	74.4	42.9	52.6	35.6	15.7	
350S162-43	1.146	88.90	41.28	12.70	1.70	230	215	13.9	20.0	33.3	94.0	94.5	52.6	35.6	15.5	
350S162-54	1.438	88.90	41.28	12.70	2.10	345	268	13.8	19.9	33.0	114	184	52.6	35.3	15.4	
350S162-68	1.811	88.90	41.28	12.70	2.60	345	332	13.8	19.6	32.5	138	363	52.6	35.1	15.2	
350S162-97	2.583	88.90	41.28	12.70	3.60	345	459	13.7	19.1	31.5	180	1020	53.1	34.5	14.7	
362S125-33	0.879	92.08	31.75	4.775	1.09	230	139	7.80	12.2	19.6	25.2	35.8	53.6	35.6	10.5	
362S125-43	1.146	92.08	31.75	4.775	1.41	230	179	7.80	12.0	19.3	31.7	78.3	53.6	35.3	10.4	
362S125-54	1.438	92.08	31.75	4.775	1.74	345	222	7.77	11.8	18.9	38.1	153	54.6	35.3	10.2	
362S162-33	0.879	92.08	41.28	12.70	1.32	230	169	13.6	20.0	33.3	79.8	43.7	53.8	36.8	15.6	
362S162-43	1.146	92.08	41.28	12.70	1.73	230	219	13.6	19.9	33.0	101	95.7	53.6	36.8	15.5	
362S162-54	1.438	92.08	41.28	12.70	2.14	345	272	13.6	19.7	32.5	123	188	53.6	36.6	15.4	
362S162-68	1.811	92.08	41.28	12.70	2.65	345	338	13.6	19.4	32.0	148	369	53.8	36.3	15.1	
362S162-97	2.583	92.08	41.28	12.70	3.66	345	467	13.5	18.9	31.2	194	1040	54.4	35.8	14.7	
400S125-33	0.879	101.6	31.75	4.775	1.15	230	147	7.37	11.8	18.7	31.7	37.9	59.9	38.9	10.3	
400S125-43	1.146	101.6	31.75	4.775	1.49	230	190	7.39	11.7	18.5	39.7	83.2	59.9	38.6	10.2	
400S125-54	1.438	101.6	31.75	4.775	1.85	345	235	7.37	11.5	18.1	47.8	162	61.2	38.4	10.0	
400S162-33	0.879	101.6	41.28	12.70	1.40	230	177	13.0	19.5	32.0	97.5	45.8	57.2	40.4	15.5	
400S162-43	1.146	101.6	41.28	12.70	1.80	230	230	13.0	19.3	31.8	124	101	57.2	40.1	15.4	
400S162-54	1.438	101.6	41.28	12.70	2.25	345	286	13.0	19.2	31.5	150	197	57.2	39.9	15.2	
400S162-68	1.811	101.6	41.28	12.70	2.78	345	355	13.0	18.9	31.0	182	388	57.4	39.6	15.0	
400S162-97	2.583	101.6	41.28	12.70	3.85	345	492	12.9	18.4	30.0	239	1100	58.4	39.1	14.6	

Stud Designation	UNPERFORATED PROPERTIES									PERFORATED PROPERTIES				
	M_{rx} (kN.m)	L_u (mm)	M_{ry} web.comp. (kN.m)	M_{ry} lips.comp. (kN.m)	Shear V_r (kN)	Web Cripp. P_r (kN)	I_x (mm ⁴ x10 ⁶)	I_y (mm ⁴ x10 ⁶)	S_f (mm ³ x10 ³)	M_{rx} (kN.m)	M_{ry} web.comp. (kN.m)	M_{ry} lips.comp. (kN.m)	Shear V_r (kN)	I_x defl. (mm ⁴ x10 ⁶)
350S125-33	0.664	726	0.125	0.130	5.83	1.45	0.161	0.0151	3.62	0.586	0.116	0.121	2.77	0.159
350S125-43	0.928	721	0.164	0.165	9.88	2.42	0.207	0.0191	4.65	0.865	0.151	0.153	3.59	0.205
350S125-54	1.67	582	0.296	0.297	19.2	5.43	0.253	0.0228	5.70	1.57	0.275	0.275	5.38	0.251
350S162-33	0.934	1090	0.288	0.305	5.83	1.45	0.211	0.0408	4.75	0.863	0.268	0.284	2.77	0.211
350S162-43	1.25	1080	0.380	0.390	9.88	2.42	0.272	0.0520	6.13	1.20	0.352	0.362	3.59	0.272
350S162-54	2.27	874	0.702	0.717	19.2	5.43	0.335	0.0633	7.54	2.16	0.651	0.665	5.38	0.335
350S162-68	2.86	874	0.863	0.864	23.9	8.10	0.410	0.0766	9.23	2.79	0.799	0.799	5.12	0.410
350S162-97	3.84	881	1.12	1.12	32.5	10.7	0.549	0.0995	12.4	3.75	1.03	1.03	4.41	0.549
362S125-33	0.698	724	0.127	0.131	5.83	1.44	0.175	0.0153	3.80	0.610	0.117	0.122	2.97	0.172
362S125-43	0.973	721	0.164	0.165	9.88	2.41	0.225	0.0193	4.88	0.903	0.153	0.154	3.84	0.223
362S125-54	1.76	579	0.296	0.298	19.2	5.43	0.275	0.0230	5.98	1.64	0.276	0.278	5.78	0.273
362S162-33	0.978	1080	0.288	0.306	5.83	1.44	0.229	0.0413	4.98	0.898	0.269	0.286	2.97	0.229
362S162-43	1.31	1080	0.381	0.391	9.88	2.41	0.296	0.0529	6.42	1.24	0.354	0.365	3.84	0.296
362S162-54	2.37	871	0.703	0.721	19.2	5.43	0.363	0.0641	7.90	2.26	0.653	0.671	5.78	0.363
362S162-68	2.99	871	0.865	0.868	24.9	8.05	0.445	0.0774	9.67	2.91	0.806	0.806	5.69	0.445
362S162-97	4.02	876	1.12	1.12	33.9	10.7	0.599	0.101	13.0	3.94	1.04	1.04	4.98	0.599
400S125-33	0.801	721	0.127	0.132	5.56	1.42	0.221	0.0157	4.34	0.681	0.117	0.124	3.38	0.218
400S125-43	1.11	716	0.165	0.167	9.88	2.38	0.284	0.0199	5.59	1.01	0.154	0.158	4.63	0.281
400S125-54	2.02	577	0.298	0.301	19.2	5.38	0.348	0.0236	6.85	1.84	0.279	0.285	6.94	0.345
400S162-33	1.12	1070	0.289	0.310	5.56	1.42	0.288	0.0429	5.67	1.00	0.270	0.293	3.38	0.288
400S162-43	1.49	1070	0.382	0.395	9.88	2.38	0.371	0.0545	7.31	1.40	0.356	0.374	4.63	0.371
400S162-54	2.71	866	0.706	0.729	19.2	5.38	0.458	0.0662	9.00	2.53	0.659	0.687	6.94	0.458
400S162-68	3.42	864	0.871	0.878	27.7	8.01	0.562	0.0799	11.0	3.30	0.815	0.826	7.74	0.562
400S162-97	4.61	864	1.14	1.14	37.9	10.6	0.753	0.104	14.9	4.54	1.07	1.07	6.89	0.753

Wall Stud Section Properties

Stud Designation	DIMENSIONS				UNPERFORATED PROPERTIES											
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)	Lip C (mm)	Weight (kg/m)	Yield F _y (MPa)	Area (mm ²)	x _{cg} (mm)	m (mm)	x _o (mm)	C _w (mm ⁶ x10 ⁶)	J (mm ⁴)	j (mm)	r _x (mm)	r _y (mm)	
550S125-33	0.879	139.7	31.75	4.775	1.41	230	180	6.07	10.5	16.2	66.1	46.6	92.7	51.3	9.70	
550S125-43	1.146	139.7	31.75	4.775	1.83	230	234	6.12	10.4	15.9	83.0	102	93.0	51.1	9.60	
550S125-54	1.438	139.7	31.75	4.775	2.28	345	290	6.12	10.2	15.6	100	200	95.5	50.8	9.40	
550S162-33	0.879	139.7	41.28	12.70	1.65	230	211	11.0	17.7	28.2	191	54.1	76.7	53.6	15.0	
550S162-43	1.146	139.7	41.28	12.70	2.14	230	274	11.0	17.6	27.9	243	120	76.7	53.6	14.8	
550S162-54	1.438	139.7	41.28	12.70	2.68	345	341	11.0	17.4	27.7	295	235	77.2	53.3	14.7	
550S162-68	1.811	139.7	41.28	12.70	3.33	345	424	11.0	17.1	27.2	360	462	78.2	53.1	14.5	
550S162-97	2.583	139.7	41.28	12.70	4.63	345	590	10.9	16.7	26.4	475	1310	80.8	52.3	14.0	
600S125-33	0.879	152.4	31.75	4.775	1.50	230	192	5.77	10.1	15.4	80.6	49.1	106	55.4	9.53	
600S125-43	1.146	152.4	31.75	4.775	1.95	230	248	5.79	10.0	15.2	102	109	107	55.1	9.40	
600S125-54	1.438	152.4	31.75	4.775	2.43	345	309	5.79	9.8	14.9	123	213	110	54.9	9.19	
600S162-33	0.879	152.4	41.28	12.70	1.74	230	222	10.5	17.2	27.2	231	57.0	85.1	57.9	14.8	
600S162-43	1.146	152.4	41.28	12.70	2.26	230	288	10.5	17.0	26.9	295	126	85.1	57.9	14.6	
600S162-54	1.438	152.4	41.28	12.70	2.81	345	359	10.5	16.8	26.7	360	247	85.9	57.7	14.5	
600S162-68	1.811	152.4	41.28	12.70	3.51	345	447	10.5	16.6	26.2	438	487	87.1	57.4	14.2	
600S162-97	2.583	152.4	41.28	12.70	4.90	345	623	10.4	16.2	25.3	577	1390	90.4	56.6	13.8	
800S162-43	1.146	203.2	41.28	12.70	2.72	230	346	8.84	15.3	23.5	559	152	128	74.7	13.9	
800S162-54	1.438	203.2	41.28	12.70	3.39	345	432	8.84	15.1	23.2	682	298	130	74.4	13.7	
800S162-68	1.811	203.2	41.28	12.70	4.23	345	539	8.86	14.9	22.8	830	591	133	73.9	13.5	
800S162-97	2.583	203.2	41.28	12.70	5.92	345	755	8.86	14.4	22.0	1100	1680	139	73.2	13.0	

Stud Designation	UNPERFORATED PROPERTIES									PERFORATED PROPERTIES				
	M _{rx} (kN.m)	L _u (mm)	M _{ry} web.comp. (kN.m)	M _{ry} lips.comp. (kN.m)	Shear V _r (kN)	Web Cripp. P _r (kN)	I _x (mm ⁴ x10 ⁶)	I _y (mm ⁴ x10 ⁶)	S _f (mm ³ x10 ³)	M _{rx} (kN.m)	M _{ry} web.comp. (kN.m)	M _{ry} lips.comp. (kN.m)	Shear V _r (kN)	I _x defl. (mm ⁴ x10 ⁶)
550S125-33	1.12	706	0.128	0.136	3.96	1.36	0.475	0.0170	6.78	1.12	0.120	0.132	3.97	0.458
550S125-43	1.68	701	0.167	0.172	8.81	2.29	0.612	0.0215	8.75	1.68	0.157	0.167	6.81	0.608
550S125-54	3.08	561	0.302	0.311	17.6	5.20	0.753	0.0256	10.7	3.08	0.285	0.301	10.7	0.745
550S162-33	1.72	1050	0.291	0.320	3.96	1.36	0.608	0.0470	8.69	1.72	0.272	0.310	3.97	0.608
550S162-43	2.29	1040	0.386	0.408	8.81	2.29	0.783	0.0604	11.2	2.29	0.362	0.395	6.81	0.783
550S162-54	4.18	843	0.714	0.752	17.6	5.20	0.966	0.0733	13.8	4.18	0.669	0.729	10.7	0.966
550S162-68	5.29	841	0.885	0.907	30.4	7.74	1.19	0.0887	17.0	5.29	0.834	0.878	14.4	1.19
550S162-97	7.19	833	1.17	1.17	54.3	10.3	1.62	0.115	23.1	7.19	1.13	1.14	17.2	1.62
600S125-33	1.24	701	0.128	0.137	3.65	1.34	0.587	0.0174	7.70	1.24	0.120	0.133	3.63	0.558
600S125-43	1.86	693	0.167	0.173	8.05	2.26	0.758	0.0219	9.93	1.86	0.157	0.168	7.03	0.745
600S125-54	3.42	556	0.303	0.313	16.1	5.16	0.932	0.0261	12.2	3.42	0.286	0.305	11.1	0.924
600S162-33	1.93	1040	0.291	0.322	3.65	1.34	0.745	0.0483	9.80	1.93	0.272	0.313	3.63	0.745
600S162-43	2.59	1040	0.386	0.411	8.05	2.26	0.966	0.0616	12.7	2.59	0.363	0.401	7.03	0.966
600S162-54	4.71	838	0.715	0.758	16.1	5.16	1.19	0.0753	15.6	4.71	0.671	0.738	11.1	1.19
600S162-68	5.98	833	0.887	0.914	30.4	7.70	1.47	0.0907	19.2	5.98	0.837	0.889	16.4	1.47
600S162-97	8.13	826	1.19	1.19	59.6	10.2	2.00	0.118	26.2	8.13	1.13	1.15	21.7	2.00
800S162-43	3.42	1010	0.389	0.420	5.96	1.44	1.93	0.0666	19.0	3.42	0.365	0.414	5.96	1.86
800S162-54	6.25	815	0.720	0.775	11.9	3.35	2.39	0.0812	23.4	6.25	0.674	0.763	11.9	2.32
800S162-68	8.45	810	0.895	0.935	24.0	5.16	2.95	0.0978	29.0	8.45	0.844	0.921	19.1	2.93
800S162-97	12.3	798	1.20	1.22	61.8	9.92	4.04	0.127	39.8	12.3	1.15	1.20	33.8	4.04

Joist Section Properties

Joist Designation	DIMENSIONS				UNPERFORATED PROPERTIES											
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)	Lip C (mm)	Weight (kg/m)	Yield F_y (MPa)	Area (mm ²)	x_{cg} (mm)	m (mm)	x_o (mm)	C_w (mm ⁶ x10 ⁶)	J (mm ⁴)	j (mm)	r_x (mm)	r_y (mm)	
600S162-43	1.146	152.4	41.28	12.70	2.26	230	288	10.5	17.0	26.9	295	126	85.1	57.9	14.6	
600S162-54	1.438	152.4	41.28	12.70	2.81	345	359	10.5	16.8	26.7	360	247	85.9	57.7	14.5	
600S162-68	1.811	152.4	41.28	12.70	3.51	345	447	10.5	16.6	26.2	438	487	87.1	57.4	14.2	
600S162-97	2.583	152.4	41.28	12.70	4.90	345	623	10.4	16.2	25.3	577	1390	90.4	56.6	13.8	
800S162-43	1.146	203.2	41.28	12.70	2.72	230	346	8.84	15.3	23.5	559	152	128	74.7	13.9	
800S162-54	1.438	203.2	41.28	12.70	3.39	345	432	8.84	15.1	23.2	682	298	130	74.4	13.7	
800S162-68	1.811	203.2	41.28	12.70	4.23	345	539	8.86	14.9	22.8	830	591	133	73.9	13.5	
800S162-97	2.583	203.2	41.28	12.70	5.92	345	755	8.86	14.4	22.0	1100	1680	139	73.2	13.0	
800S200-43	1.146	203.2	50.80	15.88	2.95	230	375	12.4	20.6	32.5	1020	164	115	76.7	18.0	
800S200-54	1.438	203.2	50.80	15.88	3.68	345	468	12.4	20.4	32.0	1250	323	116	76.5	17.8	
800S200-68	1.811	203.2	50.80	15.88	4.60	345	585	12.4	20.2	31.8	1530	641	117	76.2	17.6	
800S200-97	2.583	203.2	50.80	15.88	6.43	345	819	12.4	19.7	30.7	2060	1820	121	75.4	17.1	
800S250-43	1.146	203.2	63.50	19.05	3.23	230	412	17.4	27.7	44.5	1900	180	110	78.7	23.3	
800S250-54	1.438	203.2	63.50	19.05	4.03	345	514	17.4	27.4	44.2	2340	354	110	78.5	23.1	
800S250-68	1.811	203.2	63.50	19.05	5.04	345	643	17.4	27.2	43.7	2870	703	111	78.2	22.9	
800S250-97	2.583	203.2	63.50	19.05	7.08	345	903	17.3	26.9	42.9	3920	2010	113	77.7	22.4	
1000S162-54	1.438	254.0	41.28	12.70	3.96	345	505	7.67	13.7	20.6	1130	348	188	90.7	13.0	
1000S162-68	1.811	254.0	41.28	12.70	4.96	345	631	7.70	13.5	20.3	1380	691	193	90.2	12.8	
1000S162-97	2.583	254.0	41.28	12.70	6.95	345	884	7.75	13.1	19.5	1830	1970	204	89.4	12.3	
1000S200-54	1.438	254.0	50.80	15.88	4.26	345	541	10.8	18.7	29.0	2060	373	161	93.2	17.0	
1000S200-68	1.811	254.0	50.80	15.88	5.31	345	677	10.8	18.5	28.4	2520	741	164	92.7	16.8	
1000S200-97	2.583	254.0	50.80	15.88	7.47	345	948	10.8	18.1	27.7	3410	2110	170	91.9	16.4	

Joist Designation	UNPERFORATED PROPERTIES									PERFORATED PROPERTIES				
	M_{rx} (kN.m)	L_u (mm)	M_{ry} web.comp. (kN.m)	M_{ry} lips.comp. (kN.m)	Shear V_r (kN)	Web Cripp. P_r (kN)	I_x (mm ⁴ x10 ⁶)	I_y (mm ⁴ x10 ⁶)	S_f (mm ³ x10 ³)	M_{rx} (kN.m)	M_{ry} web.comp. (kN.m)	M_{ry} lips.comp. (kN.m)	Shear V_r (kN)	I_x defl. (mm ⁴ x10 ⁶)
600S162-43	2.59	1040	0.386	0.411	8.05	2.33	0.966	0.0616	12.7	2.59	0.363	0.401	7.03	0.966
600S162-54	4.71	838	0.715	0.758	16.1	5.29	1.19	0.0753	15.6	4.71	0.671	0.738	11.1	1.19
600S162-68	5.98	833	0.887	0.914	30.4	7.96	1.47	0.0907	19.2	5.98	0.837	0.889	16.4	1.47
600S162-97	8.13	826	1.19	1.19	59.6	14.9	2.00	0.118	26.2	8.13	1.13	1.15	21.7	2.00
800S162-43	3.42	1010	0.389	0.420	5.96	2.22	1.93	0.0666	19.0	3.42	0.365	0.414	5.96	1.86
800S162-54	6.25	815	0.720	0.775	11.9	5.12	2.39	0.0812	23.4	6.25	0.674	0.763	11.9	2.32
800S162-68	8.45	810	0.895	0.935	24.0	7.70	2.95	0.0978	29.0	8.45	0.844	0.921	19.1	2.93
800S162-97	12.3	798	1.20	1.22	61.8	14.5	4.04	0.127	39.8	12.3	1.15	1.20	33.8	4.04
800S200-43	4.34	1280	0.589	0.647	5.96	2.22	2.21	0.122	21.8	4.34	0.550	0.636	5.96	2.21
800S200-54	7.61	1030	1.09	1.20	11.9	5.12	2.73	0.149	26.9	7.61	1.02	1.17	11.9	2.73
800S200-68	10.1	1030	1.38	1.46	24.0	7.70	3.39	0.181	33.4	10.1	1.30	1.43	19.1	3.39
800S200-97	14.2	1020	1.90	1.94	61.8	14.5	4.66	0.240	45.9	14.2	1.81	1.90	33.8	4.66
800S250-43	4.61	1620	0.885	0.967	5.96	2.22	2.56	0.224	25.1	4.61	0.827	0.948	5.96	2.53
800S250-54	8.42	1310	1.66	1.83	11.9	5.12	3.17	0.275	31.3	8.42	1.55	1.80	11.9	3.15
800S250-68	11.0	1300	2.10	2.27	24.0	7.70	3.94	0.337	38.7	11.0	1.97	2.23	19.1	3.94
800S250-97	16.5	1290	2.96	3.05	61.8	14.5	5.45	0.454	53.6	16.5	2.80	2.98	33.8	5.45
1000S162-54	7.99	795	0.722	0.786	9.43	4.89	4.14	0.0853	32.6	7.99	0.677	0.778	9.43	3.88
1000S162-68	10.9	787	0.898	0.949	19.0	7.43	5.12	0.103	40.5	10.9	0.848	0.940	19.0	4.95
1000S162-97	16.6	772	1.21	1.23	56.0	14.1	7.08	0.134	55.6	16.6	1.16	1.22	40.8	7.08
1000S200-54	8.67	1010	1.10	1.22	9.43	4.89	4.70	0.157	37.0	8.67	1.03	1.21	9.43	4.41
1000S200-68	12.3	1000	1.39	1.49	19.0	7.43	5.83	0.191	45.9	12.3	1.30	1.47	19.0	5.66
1000S200-97	19.0	991	1.91	1.98	56.0	14.1	8.03	0.254	63.4	19.0	1.82	1.95	40.8	8.03

Joist Section Properties

Joist Designation	DIMENSIONS				UNPERFORATED PROPERTIES											
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)	Lip C (mm)	Weight (kg/m)	Yield F _y (MPa)	Area (mm ²)	x _{cg} (mm)	m (mm)	x _o (mm)	C _w (mm ⁶ x10 ⁶)	J (mm ⁴)	j (mm)	r _x (mm)	r _y (mm)	
1000S250-54	1.438	254.0	63.50	19.05	4.61	345	587	15.3	25.4	40.1	3810	405	144	95.8	22.3	
1000S250-68	1.811	254.0	63.50	19.05	5.76	345	735	15.3	25.2	39.6	4700	803	146	95.5	22.1	
1000S250-97	2.583	254.0	63.50	19.05	8.11	345	1030	15.3	24.8	38.9	6390	2300	149	94.7	21.6	
1000S300-54	1.438	254.0	76.20	19.05	4.90	345	624	19.5	31.2	50.0	5830	429	140	97.8	26.9	
1000S300-68	1.811	254.0	76.20	19.05	6.13	345	781	19.5	31.0	49.8	7200	853	141	97.5	26.7	
1000S300-97	2.583	254.0	76.20	19.05	8.62	345	1100	19.4	30.7	48.8	9860	2440	143	97.0	26.4	
1200S162-68	1.811	304.8	41.28	12.70	5.67	345	723	6.83	12.3	18.3	2080	791	269	106	12.1	
1200S162-97	2.583	304.8	41.28	12.70	7.98	345	1020	6.91	11.9	17.6	2770	2260	284	105	11.7	
1200S200-68	1.811	304.8	50.80	15.88	6.04	345	768	9.65	17.1	25.9	3810	841	222	109	16.1	
1200S200-97	2.583	304.8	50.80	15.88	8.50	345	1080	9.68	16.7	25.1	5130	2410	231	108	15.6	
1200S250-68	1.811	304.8	63.50	19.05	6.49	345	826	13.7	23.5	36.3	7060	903	190	112	21.3	
1200S250-97	2.583	304.8	63.50	19.05	9.14	345	1160	13.7	23.1	35.6	9640	2590	195	112	20.9	
1200S300-68	1.811	304.8	76.20	19.05	6.85	345	871	17.5	29.2	45.7	10800	953	177	115	25.9	
1200S300-97	2.583	304.8	76.20	19.05	9.66	345	1230	17.5	28.7	45.0	14900	2740	181	114	25.4	
1400S162-68	1.811	355.6	41.28	12.70	6.40	345	813	6.17	11.4	16.6	2950	891	361	122	11.6	
1400S162-97	2.583	355.6	41.28	12.70	9.00	345	1150	6.27	11.0	16.0	3950	2550	384	121	11.1	
1400S200-68	1.811	355.6	50.80	15.88	6.76	345	858	8.71	15.9	23.7	5400	941	292	125	15.5	
1400S200-97	2.583	355.6	50.80	15.88	9.52	345	1210	8.79	15.5	23.0	7300	2700	305	124	15.0	
1400S250-68	1.811	355.6	63.50	19.05	7.22	345	916	12.4	22.0	33.5	9990	1000	244	129	20.6	
1400S250-97	2.583	355.6	63.50	19.05	10.2	345	1300	12.5	21.6	32.8	13600	2880	251	128	20.1	
1400S300-68	1.811	355.6	76.20	19.05	7.57	345	968	15.9	27.4	42.4	15300	1050	222	131	25.2	
1400S300-97	2.583	355.6	76.20	19.05	10.7	345	1360	15.9	26.9	41.7	21100	3030	227	131	24.7	

Joist Designation	UNPERFORATED PROPERTIES									PERFORATED PROPERTIES				
	M _{rx} (kN.m)	L _u (mm)	M _{ry} web.comp. (kN.m)	M _{ry} lips.comp. (kN.m)	Shear V _r (kN)	Web Cripp. P _r (kN)	I _x (mm ⁴ x10 ⁶)	I _y (mm ⁴ x10 ⁶)	S _f (mm ³ x10 ³)	M _{rx} (kN.m)	M _{ry} web.comp. (kN.m)	M _{ry} lips.comp. (kN.m)	Shear V _r (kN)	I _x defl. (mm ⁴ x10 ⁶)
1000S250-54	10.4	1290	1.66	1.86	9.43	4.89	5.37	0.293	42.4	10.4	1.55	1.84	9.43	5.33
1000S250-68	14.8	1280	2.11	2.32	19.0	7.43	6.70	0.359	52.8	14.8	1.98	2.28	19.0	6.70
1000S250-97	22.5	1270	2.98	3.12	56.1	14.1	9.28	0.483	73.1	22.5	2.81	3.07	40.8	9.28
1000S300-54	10.5	1520	2.16	2.46	9.43	4.89	5.95	0.454	47.0	10.5	2.02	2.43	9.43	5.66
1000S300-68	15.0	1510	2.76	3.06	19.0	7.43	7.41	0.562	58.5	15.0	2.58	3.02	19.0	7.20
1000S300-97	23.8	1500	3.94	4.16	56.0	14.1	10.3	0.762	81.3	23.8	3.71	4.09	40.8	10.3
1200S162-68	13.4	765	0.902	0.959	15.7	7.21	8.12	0.107	53.3	13.4	0.851	0.952	15.7	7.62
1200S162-97	20.8	749	1.22	1.25	46.3	13.7	11.2	0.139	73.6	20.8	1.16	1.24	42.1	11.1
1200S200-68	15.0	983	1.39	1.50	15.7	7.21	9.12	0.199	60.0	15.0	1.30	1.49	15.7	8.62
1200S200-97	23.7	968	1.92	2.00	46.3	13.7	12.7	0.265	83.1	23.7	1.83	1.98	42.1	12.5
1200S250-68	16.2	1260	2.11	2.34	15.7	7.21	10.4	0.376	68.2	16.2	1.98	2.32	15.7	9.91
1200S250-97	27.0	1250	2.99	3.15	46.3	13.7	14.4	0.508	94.9	27.0	2.82	3.13	42.1	14.3
1200S300-68	17.9	1490	2.77	3.11	15.7	7.21	11.4	0.587	75.2	17.9	2.59	3.07	15.7	11.2
1200S300-97	30.8	1480	3.97	4.23	46.3	13.7	15.9	0.799	105	30.8	3.72	4.17	42.1	15.9
1400S162-68	15.9	744	0.904	0.966	13.4	7.03	12.1	0.109	67.8	15.9	0.852	0.961	13.4	10.9
1400S162-97	25.0	729	1.22	1.27	39.4	13.4	16.7	0.142	93.9	25.0	1.16	1.25	39.4	16.1
1400S200-68	17.9	963	1.39	1.51	13.4	7.03	13.4	0.206	75.5	17.9	1.31	1.50	13.4	12.3
1400S200-97	28.4	945	1.93	2.02	39.4	13.4	18.7	0.273	105	28.4	1.83	2.00	39.4	18.1
1400S250-68	19.1	1240	2.12	2.37	13.4	7.03	15.2	0.390	85.4	19.1	1.99	2.35	13.4	14.0
1400S250-97	32.3	1220	3.01	3.19	39.4	13.4	21.1	0.524	119	32.3	2.84	3.16	39.4	20.5
1400S300-68	19.7	1480	2.78	3.15	13.4	7.03	16.6	0.612	93.4	19.7	2.59	3.12	13.4	14.9
1400S300-97	33.8	1460	3.98	4.27	39.4	13.4	23.2	0.828	130	33.8	3.73	4.24	39.4	22.6

Track Section Properties

Track Designation	DIMENSIONS			Weight (kg/m)	Yield F_y (MPa)	Area (mm^2)	x_{CG} (mm)	x_o (mm)	C_w ($\text{mm}^6 \times 10^6$)	J (mm^4)	j (mm)
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)								
350T125-33	0.879	88.90	31.75	1.05	230	134	6.88	17.0	18.8	34.5	51.1
350T125-43	1.146	88.90	31.75	1.37	230	174	6.96	16.8	24.2	76.2	51.1
350T125-54	1.438	88.90	31.75	1.71	345	219	7.06	16.7	30.6	151	51.6
350T125-68	1.811	88.90	31.75	2.16	345	275	7.19	16.5	38.7	301	51.8
350T125-97	2.583	88.90	31.75	3.08	345	392	7.42	16.2	56.1	874	52.8
350T150-33	0.879	88.90	38.10	1.14	230	145	9.04	22.0	30.6	37.3	51.1
350T150-43	1.146	88.90	38.10	1.48	230	189	9.12	21.9	39.7	82.4	51.1
350T150-54	1.438	88.90	38.10	1.86	345	237	9.19	21.7	50.2	163	51.3
350T150-68	1.811	88.90	38.10	2.34	345	298	9.32	21.5	63.9	326	51.6
350T150-97	2.583	88.90	38.10	3.33	345	425	9.55	21.1	92.9	945	52.3
350T200-33	0.879	88.90	50.80	1.31	230	167	13.8	32.8	66.9	42.9	55.6
350T200-43	1.146	88.90	50.80	1.71	230	218	13.8	32.5	86.7	95.3	55.6
350T200-54	1.438	88.90	50.80	2.14	345	274	13.9	32.3	110	189	55.6
350T200-68	1.811	88.90	50.80	2.71	345	345	14.0	32.0	140	376	55.9
350T200-97	2.583	88.90	50.80	3.85	345	491	14.2	31.8	205	1090	56.1
362T125-33	0.879	92.08	31.75	1.07	230	137	6.76	16.7	20.3	35.2	53.1
362T125-43	1.146	92.08	31.75	1.40	230	178	6.83	16.6	26.3	77.8	53.1
362T125-54	1.438	92.08	31.75	1.76	345	223	6.93	16.5	33.0	154	53.6
362T125-68	1.811	92.08	31.75	2.20	345	281	7.04	16.3	41.9	307	54.1
362T125-97	2.583	92.08	31.75	3.14	345	401	7.29	15.9	60.7	891	55.1
362T150-33	0.879	92.08	38.10	1.16	230	148	8.89	21.7	33.3	38.0	52.8
362T150-43	1.146	92.08	38.10	1.52	230	192	8.97	21.6	43.0	84.1	52.8
362T150-54	1.438	92.08	38.10	1.89	345	241	9.04	21.4	54.2	166	53.1
362T150-68	1.811	92.08	38.10	2.38	345	304	9.17	21.2	69.0	333	53.3
362T150-97	2.583	92.08	38.10	3.41	345	434	9.40	20.8	100	966	54.1
362T200-33	0.879	92.08	50.80	1.33	230	170	13.5	32.3	72.2	43.7	56.6
362T200-43	1.146	92.08	50.80	1.74	230	221	13.6	32.3	94.0	97.0	56.6
362T200-54	1.438	92.08	50.80	2.19	345	278	13.7	32.0	119	191	56.9
362T200-68	1.811	92.08	50.80	2.75	345	350	13.8	31.8	151	383	56.9
362T200-97	2.583	92.08	50.80	3.91	345	499	14.0	31.2	222	1110	57.2

Track Designation	r_x (mm)	r_y (mm)	I_x ($\text{mm}^4 \times 10^6$)	I_y ($\text{mm}^4 \times 10^6$)	S_f ($\text{mm}^3 \times 10^3$)	M_{rx} (kN.m)	L_u (mm)	Shear V_r (kN)	I_x defl. ($\text{mm}^3 \times 10^6$)
350T125-33	35.6	9.63	0.169	0.0124	3.64	0.555	653	5.83	0.146
350T125-43	35.6	9.60	0.220	0.0160	4.72	0.782	655	9.88	0.202
350T125-54	35.6	9.53	0.278	0.0199	5.92	1.51	531	19.2	0.258
350T125-68	35.8	9.47	0.354	0.0246	7.44	2.07	536	25.8	0.346
350T125-97	36.3	9.32	0.516	0.0340	10.6	3.28	546	36.3	0.516
350T150-33	36.3	11.9	0.192	0.0206	4.15	0.575	785	5.83	0.157
350T150-43	36.3	11.9	0.250	0.0266	5.39	0.815	787	9.88	0.218
350T150-54	36.6	11.8	0.317	0.0330	6.75	1.57	640	19.2	0.279
350T150-68	36.8	11.7	0.405	0.0411	8.49	2.18	645	25.8	0.378
350T150-97	37.3	11.6	0.591	0.0570	12.1	3.56	655	36.3	0.591
350T200-33	37.8	16.4	0.239	0.0450	5.16	0.607	1040	5.83	0.176
350T200-43	37.8	16.4	0.312	0.0583	6.70	0.863	1040	9.88	0.246
350T200-54	38.1	16.3	0.395	0.0728	8.41	1.67	848	19.2	0.316
350T200-68	38.4	16.3	0.504	0.0907	10.6	2.33	856	25.8	0.433
350T200-97	38.9	16.1	0.741	0.127	15.1	3.91	871	36.3	0.703
362T125-33	36.6	9.58	0.182	0.0125	3.80	0.584	653	5.83	0.159
362T125-43	36.6	9.53	0.238	0.0162	4.95	0.821	655	9.88	0.219
362T125-54	36.8	9.47	0.301	0.0201	6.19	1.58	531	19.2	0.279
362T125-68	36.8	9.40	0.383	0.0249	7.78	2.17	533	26.8	0.375
362T125-97	37.3	9.27	0.558	0.0343	11.1	3.43	544	37.7	0.558
362T150-33	37.6	11.9	0.208	0.0208	4.33	0.606	785	5.83	0.170
362T150-43	37.6	11.8	0.271	0.0268	5.62	0.855	787	9.88	0.236
362T150-54	37.6	11.8	0.343	0.0333	7.06	1.65	640	19.2	0.302
362T150-68	37.8	11.7	0.437	0.0415	8.88	2.28	643	26.8	0.409
362T150-97	38.4	11.5	0.637	0.0574	12.6	3.73	655	37.7	0.637
362T200-33	38.9	16.4	0.258	0.0458	5.37	0.638	1040	5.83	0.191
362T200-43	38.9	16.3	0.336	0.0591	7.00	0.907	1040	9.88	0.266
362T200-54	39.1	16.3	0.425	0.0737	8.78	1.75	848	19.2	0.341
362T200-68	39.4	16.2	0.545	0.0920	11.1	2.44	853	26.8	0.466
362T200-97	39.9	16.1	0.799	0.129	15.8	4.09	871	37.7	0.758

Track Section Properties

Track Designation	DIMENSIONS			Weight (kg/m)	Yield F_y (MPa)	Area (mm ²)	x_{CG} (mm)	x_o (mm)	C_w (mm ⁶ x10 ⁶)	J (mm ⁴)	j (mm)
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)								
400T125-33	0.879	101.6	31.75	1.14	230	145	6.38	16.0	25.4	37.3	59.7
400T125-43	1.146	101.6	31.75	1.48	230	189	6.48	15.9	32.8	82.4	59.7
400T125-54	1.438	101.6	31.75	1.86	345	237	6.58	15.8	41.4	163	60.2
400T125-68	1.811	101.6	31.75	2.34	345	298	6.71	15.6	52.1	326	60.7
400T125-97	2.583	101.6	31.75	3.33	345	425	6.96	15.2	75.2	945	62.0
400T150-33	0.879	101.6	38.10	1.23	230	156	8.43	20.9	41.6	40.2	57.9
400T150-43	1.146	101.6	38.10	1.59	230	203	8.51	20.8	53.7	89.1	57.9
400T150-54	1.438	101.6	38.10	2.01	345	255	8.61	20.6	67.7	176	58.4
400T150-68	1.811	101.6	38.10	2.51	345	321	8.71	20.4	85.9	351	58.7
400T150-97	2.583	101.6	38.10	3.59	345	458	8.97	20.0	124	1020	59.7
400T200-33	0.879	101.6	50.80	1.40	230	179	12.9	31.2	90.2	45.8	60.2
400T200-43	1.146	101.6	50.80	1.83	230	232	13.0	31.0	117	102	60.2
400T200-54	1.438	101.6	50.80	2.29	345	292	13.1	31.0	148	201	60.5
400T200-68	1.811	101.6	50.80	2.89	345	367	13.2	30.7	189	402	60.7
400T200-97	2.583	101.6	50.80	4.11	345	523	13.4	30.2	274	1170	61.0
550T125-33	0.879	139.7	31.75	1.40	230	179	5.26	13.7	52.4	45.8	93.5
550T125-43	1.146	139.7	31.75	1.83	230	232	5.36	13.6	67.7	102	93.7
550T125-54	1.438	139.7	31.75	2.29	345	292	5.46	13.5	84.6	201	94.5
550T125-68	1.811	139.7	31.75	2.89	345	367	5.61	13.4	107	402	95.5
550T125-97	2.583	139.7	31.75	4.11	345	523	5.89	13.1	151	1170	97.5
550T150-33	0.879	139.7	38.10	1.49	230	190	7.01	18.1	85.9	48.7	85.1
550T150-43	1.146	139.7	38.10	1.93	230	247	7.11	18.0	111	108	85.3
550T150-54	1.438	139.7	38.10	2.43	345	310	7.21	17.9	139	214	85.9
550T150-68	1.811	139.7	38.10	3.07	345	390	7.34	17.7	176	429	86.6
550T150-97	2.583	139.7	38.10	4.36	345	556	7.59	17.4	252	1240	88.1
550T200-33	0.879	139.7	50.80	1.67	230	212	10.9	27.7	186	54.5	79.2
550T200-43	1.146	139.7	50.80	2.17	230	276	11.0	27.4	242	121	79.5
550T200-54	1.438	139.7	50.80	2.72	345	346	11.1	27.4	303	239	79.8
550T200-68	1.811	139.7	50.80	3.42	345	436	11.3	27.2	384	479	80.3
550T200-97	2.583	139.7	50.80	4.88	345	622	11.5	26.7	556	1380	81.0

Track Designation	r_x (mm)	r_y (mm)	I_x (mm ⁴ x10 ⁶)	I_y (mm ⁴ x10 ⁶)	S_f (mm ³ x10 ³)	M_{rx} (kN.m)	L_u (mm)	Shear V_r (kN)	I_x defl. (mm ⁴ x10 ⁶)
400T125-33	39.6	9.42	0.229	0.0129	4.34	0.674	650	5.34	0.200
400T125-43	39.6	9.37	0.298	0.0166	5.64	0.946	650	9.88	0.275
400T125-54	39.9	9.32	0.376	0.0206	7.06	1.82	528	19.2	0.350
400T125-68	40.1	9.25	0.479	0.0255	8.87	2.49	531	29.6	0.470
400T125-97	40.4	9.09	0.695	0.0352	12.6	3.91	536	41.8	0.695
400T150-33	40.6	11.7	0.259	0.0214	4.92	0.699	782	5.34	0.214
400T150-43	40.6	11.6	0.338	0.0276	6.39	0.984	785	9.88	0.296
400T150-54	40.9	11.6	0.429	0.0343	8.01	1.90	638	19.2	0.378
400T150-68	41.1	11.5	0.545	0.0425	10.1	2.61	640	29.6	0.508
400T150-97	41.7	11.4	0.791	0.0591	14.3	4.23	650	41.8	0.791
400T200-33	42.4	16.2	0.320	0.0470	6.08	0.738	1040	5.34	0.239
400T200-43	42.4	16.2	0.416	0.0608	7.90	1.04	1040	9.88	0.333
400T200-54	42.4	16.1	0.529	0.0758	9.90	2.01	848	19.2	0.425
400T200-68	42.9	16.1	0.674	0.0945	12.5	2.79	853	29.6	0.579
400T200-97	43.4	15.9	0.982	0.132	17.9	4.63	866	41.8	0.932
550T125-33	52.1	8.81	0.483	0.0138	6.72	0.904	635	3.86	0.411
550T125-43	52.1	8.76	0.629	0.0178	8.73	1.40	635	8.54	0.587
550T125-54	52.1	8.71	0.791	0.0221	10.9	2.71	516	16.9	0.745
550T125-68	52.3	8.64	1.00	0.0274	13.7	3.91	516	30.4	0.986
550T125-97	52.6	8.51	1.45	0.0378	19.5	6.04	516	58.3	1.45
550T150-33	53.3	11.0	0.537	0.0231	7.52	1.04	772	3.86	0.458
550T150-43	53.3	11.0	0.703	0.0298	9.77	1.57	772	8.54	0.624
550T150-54	53.3	10.9	0.887	0.0370	12.2	3.03	627	16.9	0.795
550T150-68	53.6	10.9	1.12	0.0462	15.4	4.09	627	30.4	1.06
550T150-97	54.1	10.7	1.62	0.0641	21.8	6.50	630	58.3	1.62
550T200-33	55.4	15.6	0.653	0.0512	9.09	1.03	1040	3.86	0.508
550T200-43	55.4	15.5	0.849	0.0666	11.8	1.66	1040	8.54	0.695
550T200-54	55.6	15.5	1.07	0.0828	14.8	3.20	846	16.9	0.887
550T200-68	55.9	15.4	1.36	0.103	18.7	4.36	848	30.4	1.19
550T200-97	56.4	15.2	1.98	0.144	26.5	7.07	853	58.3	1.88

Track Section Properties

Track Designation	DIMENSIONS			Weight (kg/m)	Yield F_y (MPa)	Area (mm^2)	x_{CG} (mm)	x_O (mm)	C_w ($\text{mm}^6 \times 10^6$)	J (mm^4)	j (mm)
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)								
600T125-33	0.879	152.4	31.75	1.49	230	190	4.98	13.1	63.9	48.7	107
600T125-43	1.146	152.4	31.75	1.93	230	247	5.08	13.0	82.4	108	108
600T125-54	1.438	152.4	31.75	2.43	345	310	5.18	12.9	103	214	108
600T125-68	1.811	152.4	31.75	3.07	345	390	5.33	12.8	130	429	110
600T125-97	2.583	152.4	31.75	4.36	345	556	5.61	12.5	184	1240	112
600T150-33	0.879	152.4	38.10	1.58	230	201	6.65	17.4	105	51.6	96.5
600T150-43	1.146	152.4	38.10	2.05	230	261	6.73	17.3	135	114	96.8
600T150-54	1.438	152.4	38.10	2.57	345	328	6.83	17.1	170	226	97.3
600T150-68	1.811	152.4	38.10	3.24	345	414	6.99	17.0	214	454	98.3
600T150-97	2.583	152.4	38.10	4.63	345	589	7.24	16.7	306	1310	100
600T200-33	0.879	152.4	50.80	1.76	230	223	10.4	26.7	227	57.4	87.4
600T200-43	1.146	152.4	50.80	2.28	230	291	10.5	26.4	295	127	87.6
600T200-54	1.438	152.4	50.80	2.86	345	365	10.6	26.4	371	251	87.9
600T200-68	1.811	152.4	50.80	3.60	345	459	10.7	26.2	470	504	88.4
600T200-97	2.583	152.4	50.80	5.13	345	652	11.0	25.9	674	1460	89.4
800T125-43	1.146	203.2	31.75	2.40	230	305	4.22	11.1	158	134	177
800T125-54	1.438	203.2	31.75	3.01	345	383	4.34	11.0	197	264	178
800T125-68	1.811	203.2	31.75	3.78	345	483	4.50	10.8	247	529	180
800T125-97	2.583	203.2	31.75	5.40	345	690	4.80	10.6	349	1530	183
800T150-43	1.146	203.2	38.10	2.51	230	320	5.61	14.8	261	140	153
800T150-54	1.438	203.2	38.10	3.15	345	401	5.74	14.7	328	276	154
800T150-68	1.811	203.2	38.10	3.97	345	505	5.87	14.6	411	554	155
800T150-97	2.583	203.2	38.10	5.66	345	723	6.17	14.3	580	1600	158
800T200-43	1.146	203.2	50.80	2.74	230	349	8.86	23.2	569	153	128
800T200-54	1.438	203.2	50.80	3.44	345	438	8.97	23.1	714	302	129
800T200-68	1.811	203.2	50.80	4.33	345	551	9.09	22.9	902	604	130
800T200-97	2.583	203.2	50.80	6.18	345	787	9.37	22.6	1290	1750	131

Track Designation	r_x (mm)	r_y (mm)	I_x ($\text{mm}^4 \times 10^6$)	I_y ($\text{mm}^4 \times 10^6$)	S_f ($\text{mm}^3 \times 10^3$)	M_{rx} (kN.m)	L_u (mm)	Shear V_r (kN)	I_x defl. ($\text{mm}^4 \times 10^6$)
600T125-33	55.9	8.61	0.595	0.0141	7.62	0.996	630	3.54	0.499
600T125-43	55.9	8.56	0.774	0.0181	9.90	1.55	630	7.83	0.716
600T125-54	56.1	8.51	0.974	0.0225	12.4	3.01	511	15.5	0.912
600T125-68	56.4	8.46	1.24	0.0279	15.6	4.36	511	30.4	1.22
600T125-97	56.6	8.31	1.78	0.0385	22.1	6.85	511	61.8	1.78
600T150-33	57.4	10.8	0.662	0.0236	8.47	1.02	770	3.54	0.529
600T150-43	57.4	10.8	0.862	0.0304	11.0	1.59	767	7.83	0.762
600T150-54	57.7	10.7	1.09	0.0378	13.8	3.10	622	15.5	0.970
600T150-68	57.7	10.7	1.38	0.0470	17.4	4.53	622	30.4	1.30
600T150-97	58.2	10.5	1.99	0.0653	24.6	7.34	625	61.8	1.99
600T200-33	59.7	15.3	0.795	0.0524	10.2	1.12	1040	3.54	0.624
600T200-43	59.7	15.3	1.04	0.0678	13.3	1.90	1040	7.83	0.857
600T200-54	59.9	15.2	1.31	0.0849	16.6	3.65	843	15.5	1.09
600T200-68	60.2	15.2	1.66	0.106	21.0	4.95	846	30.4	1.46
600T200-97	60.7	15.0	2.40	0.148	29.8	7.97	851	61.8	2.29
800T125-43	71.6	7.90	1.57	0.0191	15.1	2.15	605	5.87	1.39
800T125-54	71.9	7.87	1.98	0.0237	19.0	4.18	490	11.6	1.77
800T125-68	71.9	7.80	2.50	0.0293	23.8	6.18	488	23.2	2.43
800T125-97	72.1	7.67	3.58	0.0405	33.8	10.5	488	61.8	3.58
800T150-43	73.4	10.0	1.72	0.0323	16.7	2.19	744	5.87	1.47
800T150-54	73.7	9.98	2.17	0.0400	20.8	4.29	605	11.6	1.87
800T150-68	73.7	9.93	2.74	0.0499	26.2	6.38	605	23.2	2.58
800T150-97	73.9	9.80	3.95	0.0691	37.2	11.1	602	61.8	3.95
800T200-43	76.5	14.5	2.04	0.0728	19.7	2.27	1020	5.87	1.59
800T200-54	76.5	14.4	2.56	0.0907	24.6	4.43	831	11.6	2.03
800T200-68	76.7	14.3	3.24	0.113	31.0	6.65	831	23.2	2.83
800T200-97	77.0	14.2	4.66	0.158	43.9	12.0	831	61.8	4.50

Track Section Properties

Track Designation	DIMENSIONS			Weight (kg/m)	Yield F_y (MPa)	Area (mm ²)	x_{CG} (mm)	x_o (mm)	C_w (mm ⁶ x10 ⁶)	J (mm ⁴)	j (mm)
	Design Thickness (mm)	Depth A (mm)	Flange B (mm)								
1000T125-54	1.438	254.0	31.75	3.59	345	456	3.76	9.55	325	314	269
1000T125-68	1.811	254.0	31.75	4.51	345	574	3.91	9.45	405	629	272
1000T125-97	2.583	254.0	31.75	6.43	345	819	4.24	9.22	569	1820	274
1000T150-54	1.438	254.0	38.10	3.72	345	474	4.95	12.9	540	327	228
1000T150-68	1.811	254.0	38.10	4.69	345	597	5.11	12.8	677	653	230
1000T150-97	2.583	254.0	38.10	6.68	345	852	5.41	12.6	956	1890	234
1000T200-54	1.438	254.0	50.80	4.00	345	511	7.77	20.5	1190	352	183
1000T200-68	1.811	254.0	50.80	5.04	345	643	7.92	20.4	1500	703	184
1000T200-97	2.583	254.0	50.80	7.20	345	916	8.20	20.1	2130	2040	187
1200T125-68	1.811	304.8	31.75	5.22	345	665	3.51	8.36	610	728	384
1200T125-97	2.583	304.8	31.75	7.46	345	948	3.84	8.18	851	2110	389
1200T150-68	1.811	304.8	38.10	5.42	345	690	4.55	11.4	1020	753	323
1200T150-97	2.583	304.8	38.10	7.71	345	981	4.85	11.2	1430	2190	328
1200T200-68	1.811	304.8	50.80	5.77	345	735	7.04	18.4	2260	803	252
1200T200-97	2.583	304.8	50.80	8.23	345	1050	7.34	18.1	3200	2330	254
1400T125-68	1.811	355.6	31.75	5.95	345	761	3.18	7.52	857	828	516
1400T125-97	2.583	355.6	31.75	8.48	345	1080	3.51	7.34	1190	2410	523
1400T150-68	1.811	355.6	38.10	6.13	345	781	4.11	10.3	1440	853	432
1400T150-97	2.583	355.6	38.10	8.75	345	1120	4.45	10.1	2010	2480	439
1400T200-68	1.811	355.6	50.80	6.49	345	826	6.35	16.8	3200	903	333
1400T200-97	2.583	355.6	50.80	9.26	345	1180	6.68	16.5	4540	2620	335

Track Designation	r_x (mm)	r_y (mm)	I_x (mm ⁴ x10 ⁶)	I_y (mm ⁴ x10 ⁶)	S_f (mm ³ x10 ³)	M_{rx} (kN.m)	L_u (mm)	Shear V_r (kN)	I_x defl. (mm ⁴ x10 ⁶)
1000T125-54	87.1	7.34	3.47	0.0245	26.7	5.37	470	9.25	2.97
1000T125-68	87.4	7.26	4.37	0.0304	33.6	8.00	470	18.5	4.10
1000T125-97	87.6	7.16	6.29	0.0420	47.7	14.0	467	53.8	6.29
1000T150-54	89.2	9.37	3.77	0.0416	29.2	5.48	584	9.25	3.11
1000T150-68	89.4	9.30	4.75	0.0516	36.5	8.24	584	18.5	4.33
1000T150-97	89.7	9.19	6.83	0.0716	51.9	14.8	582	53.8	6.83
1000T200-54	92.5	13.6	4.37	0.0949	33.8	5.65	813	9.25	3.34
1000T200-68	92.7	13.6	5.54	0.119	42.4	8.55	813	18.5	4.70
1000T200-97	93.0	13.4	7.95	0.166	60.5	15.7	810	53.8	7.66
1200T125-68	103	6.83	6.99	0.0311	45.1	9.83	452	15.4	6.29
1200T125-97	103	6.73	10.0	0.0429	63.9	17.5	447	44.9	9.82
1200T150-68	105	8.79	7.53	0.0533	48.5	10.1	564	15.4	6.58
1200T150-97	105	8.66	10.8	0.0737	69.0	18.4	561	44.9	10.6
1200T200-68	108	12.9	8.66	0.122	55.6	10.5	792	15.4	7.12
1200T200-97	109	12.8	12.4	0.171	79.0	19.4	790	44.9	11.7
1400T125-68	118	6.45	10.5	0.0317	58.0	11.6	434	13.2	8.99
1400T125-97	118	6.38	15.0	0.0437	82.3	21.0	429	38.4	14.2
1400T150-68	120	8.33	11.2	0.0541	62.1	12.0	546	13.2	9.41
1400T150-97	120	8.23	16.1	0.0753	88.2	22.0	544	38.4	15.3
1400T200-68	124	12.3	12.7	0.126	70.3	12.3	775	13.2	10.1
1400T200-97	124	12.2	18.2	0.175	100	23.2	770	38.4	16.8