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National Standard of the People's Republic of China

GB/T 6728-2025

Replaces GB/T 6728-2017, GB/T 6723-2017

Cold-formed steel sections for general structure

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State Administration for Market Regulation
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目录

Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization—Part 1: Rules for the structure and drafting of standardization documents".

This document replaces GB/T 6728-2017 "Cold-formed hollow structural steel sections" and GB/T 6723-2017 "General cold-formed open steel sections". This document is based on GB/T 6728-2017 and incorporates the contents of GB/T 6723-2017. Compared with GB/T 6728-2017, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

— Added dimensions and specifications for steel sections (see Table 1, Table 2, Table 3);

— Changed the measurement positions for steel sections (see Table 5, Table 6, Table 20);

— Added requirements for out-of-roundness of circular steel sections (see Table 24);

— Added requirements for laser cutting or plasma cutting (see 6.3.3);

— Changed requirements for steel grades and chemical composition (see 6.5, 9.1 of GB/T 6728—2017);

— Added manufacturing process (see 6.7);

— Added mechanical property requirements (see 6.8);

— Changed requirements for galvanized layer weight (see 6.11, 9.2 of GB/T 6728—2017);

——Added re-inspection and judgment rules for galvanized layer weight (see 8.3);

——Changed the requirements for allowable wall thickness deviation (see Appendix B, 5.6 of GB/T 6728—2017).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying any or all such patent rights.

This document was proposed by the China Iron and Steel Industry Association.

This document is under the jurisdiction of the National Technical Committee on Steel of Standardization Administration of China (SAC/TC 183).

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The previous versions of the document replaced by this document are as follows:

——GB/T 6723, first published in 1986, first revision in 2002, second revision in 2017.

——GB/T 6728, first published in 1986, first revision in 2002, second revision in 2017.

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Cold-formed steel sections for structural purposes

1 Scope

This document specifies the ordering content, classification, codes, technical requirements, inspection rules, packaging, marking, transportation, storage, and quality certificates for cold-formed steel sections for structural purposes (hereinafter referred to as steel sections), and describes the corresponding test methods.

This document is applicable to general cold-formed open steel sections (hereinafter referred to as open steel sections), and circular, rectangular, and square cold-formed closed steel sections (hereinafter referred to as closed steel sections) produced from cold-rolled or hot-rolled steel sheets and strips on continuous roll-forming units; it is also applicable to continuous hot-dip galvanized steel sections (hereinafter referred to as galvanized steel sections).

This document is not applicable to steel sections cold-formed and welded from galvanized steel sheets and strips.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 222 Permissible deviations for chemical composition of steel products

GB/T 228.1 Metallic materials—Tensile testing—Part 1: Method of test at room temperature

GB/T 229 Metallic materials—Charpy pendulum impact test method

GB/T 470-2008 Zinc ingots

GB/T 699 Quality carbon structural steels

GB/T 700 Carbon structural steels

GB/T 709 Dimensions, shape, weight and tolerances for hot-rolled steel plates and strips

GB/T 714 Structural steel for bridge

GB/T 1591 High strength low alloy structural steels

GB/T 2101 General provisions for acceptance, packaging, marking and certification of section steel

GB/T 2102 Acceptance, packaging, marking and certification of steel pipes

GB/T 2975 Steel and steel products—Location and preparation of samples and test pieces for mechanical testing

GB/T 3280 Cold rolled stainless steel plate, sheet and strip

GB/T 4171 Atmospheric corrosion resisting structural steel

GB/T 8170 Rules of rounding off for numerical values and expression and judgement of limiting values

GB/T 20066 Steel and iron - Sampling and preparation of samples for the determination of chemical composition

GB/T 20878 Stainless steel - Grades and chemical composition

GB/T 33162 Hot-rolled steel plates and strips for cold formed steel sections

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 free edge

An edge in an open steel section that has a rounded corner $(R角)$ at only one end.

3.2 non-free edge

An edge in an open steel section that has rounded corners (R corners) at both ends.

4 Ordering information

Contracts or orders placed under this document shall include the following information:

a) Number of this document;

b) Product name;

c) Steel grade;

d) Delivery weight;

e) Dimensions and shape;

f) Special requirements.

5 Classification and codes

5.1 Closed steel sections are classified by shape into square, rectangular, and circular, with the following codes:

a) Square steel section (also referred to as square tube): F;

b) Rectangular steel section (also referred to as rectangular tube): J;

c) Circular steel section (also referred to as circular tube): Y (or ϕ);

5.2 Open steel sections are classified into 9 types by cross-sectional shape, with the following codes:

a) Cold-formed equal-leg angle steel: JD;

b) Cold-formed unequal-leg angle steel: JB;

c) Cold-formed equal-leg channel steel: CD;

d) Cold-formed unequal-leg channel steel: CB;

e) Cold-formed inward-lipped channel steel: CN;

f) Cold-formed outward-lipped channel steel: CW;

g) Cold-formed Z-section steel: Z;

h) Cold-formed lipped Z -section steel: ZJ ;

i) Cold-formed lipped equal-leg angle steel: JJ.

6 Technical Requirements

6.1 Cross-section, Dimensions and Permissible Deviations

6.1.1 Closed Steel Sections

6.1.1.1 The cross-section of square steel sections is shown in Figure 1. The cross-sectional dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties shall comply with the provisions of Table 1. The cross-sectional area, section property parameters, and surface area per meter are for reference only.

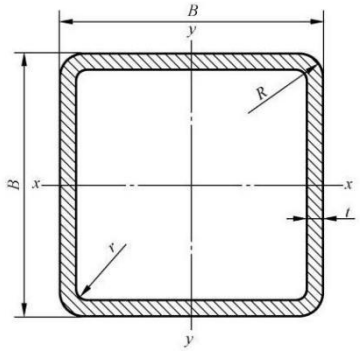
6.1.1.2 The cross-section of rectangular steel sections is shown in Figure 2. The cross-sectional dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties shall comply with the provisions of Table 2. The cross-sectional area, section property parameters, and surface area per meter are for reference only.

6.1.1.3 The cross-section of circular steel sections is shown in Figure 3. The cross-sectional dimensions, permissible deviations, theoretical weight, cross-sectional area, and

section properties shall comply with the provisions of Table 3. The cross-sectional area, section property parameters, and surface area per meter are for reference only.

6.1.1.4 The section properties of closed steel sections may be calculated by referring to Appendix A. Upon agreement between the supplier and the purchaser and specified in the contract, steel sections with dimensions and permissible deviations other than those specified in Table 1, Table 2, and Table 3 may be provided.

6.1.1.5 The permissible deviations for the wall thickness of closed steel sections shall comply with the provisions of Appendix B.



Explanation of symbols:

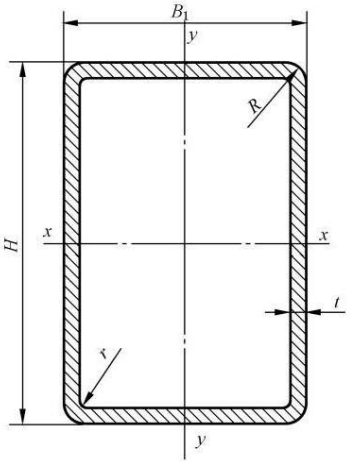
B — side length;

t — wall thickness;

R — outer arc radius;

r — inner arc radius;

Figure 1 Square steel section



Explanation of symbols:

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H —— long side length;

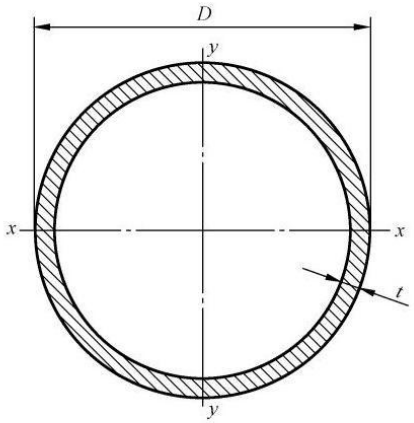
B_1 —— Short side length;

t _____wall thickness;

R —outer arc radius;

r —inner arc radius;

Fig. 2 Rectangular steel section



标引符号说明：

D ——外径；

t ——壁厚；

Fig. 3 Circular steel section

Table 1 Sectional dimensions, permissible deviations, theoretical weight, cross-sectional area, and sectional properties of square steel sections

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	As
20	±0.50	1.2	0.679	0.865	0.507	0.766	0.507	0.823	0.753	2.40	1.20	75879
		1.5	0.826	1.052	0.605	0.758	0.605	0.985	0.884	3.00	1.50	74 849
		1.7	0.918	1.170	0.668	0.755	0.668	1.083	0.961	3.40	1.70	74162
		2.0	1.050	1.337	0.762	0.755	0.762	1.215	1.060	4.00	2.00	73 132
25	±0.50	1.2	0.868	1.105	1.034	0.967	0.828	1.661	1.236	2.40	1.20	95879
		1.5	1.061	1.352	1.239	0.957	0.991	2.008	1.471	3.00	1.50	94849
		1.7	1.185	1.510	1.368	0.952	1.094	2.225	1.612	3.40	1.70	94 162

			2.0	1.364	1.737	1.553	0.946	1.243	2.526	1.804	4.00	2.00	93 132
30		±0.50	1.5	1.297	1.652	2.218	1.159	1.479	3.568	2.207	3.00	1.50	114 849
			1.7	1.452	1.850	2.454	1.152	1.636	3.970	2.433	3.40	1.70	114 162
			1.8	1.528	1.947	2.569	1.149	1.713	4.165	2.541	3.60	1.80	113819
			2.0	1.678	2.137	2.792	1.143	1.861	4.540	2.747	4.00	2.00	113 132
			2.2	1.823	2.322	3.009	1.138	2.006	4.898	2.938	4.40	2.20	112 445
			2.5	2.032	2.589	3.327	1.134	2.218	5.401	3.202	5.00	2.50	111 415
			2.7	2.200	2.803	3.590	1.132	2.394	5.790	3.399	5.50	2.75	110 557
		5											
			3.0	2.361	3.008	3.858	1.133	2.572	6.150	3.577	6.00	3.00	109 699
	40	±0.50	1.5	1.768	2.252	5.512	1.565	2.756	8.746	4.128	3.00	1.50	154 849
			1.7	1.986	2.530	6.128	1.556	3.064	9.782	4.584	3.40	1.70	154 162
			1.8	2.094	2.667	6.428	1.552	3.214	10.28	4.804	3.60	1.80	153819
									8				
			2.0	2.306	2.937	7.010	1.545	3.505	11.27	5.230	4.00	2.00	153 132
									7				

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Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (cont.)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	±Δ	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
40	±0.50	2.2	2.513	3.202	7.573	1.538	3.787	12.235	5.637	4.40	2.20	152445
		2.5	2.817	3.589	8.386	1.529	4.193	13.614	6.210	5.00	2.50	151415
		2.75	3.064	3.903	9.040	1.522	4.520	14.709	6.656	5.50	2.75	150557
		3.0	3.303	4.208	9.678	1.516	4.839	15.755	7.074	6.00	3.00	149699
		3.5	3.764	4.795	10.930	1.510	5.465	17.697	7.828	7.00	3.50	147982

		3.75	3.984	5.075	11.557	1.509	5.779	18.593	8.166	7.50	3.75	147123
		4.0	4.198	5.348	12.194	1.510	6.097	19.438	8.479	8.00	4.00	146265
50	±0.50	1.5	2.239	2.852	11.088	1.972	4.445	17.417	6.649	3.00	1.50	194849
		1.7	2.520	3.210	12.369	1.963	4.948	19.537	7.414	3.40	1.70	194162
		1.8	2.659	3.387	12.995	1.959	5.198	20.578	7.787	3.60	1.80	193819
		2.0	2.934	3.737	14.217	1.950	5.687	22.626	8.513	4.00	2.00	193132
		2.2	3.204	4.082	15.402	1.943	6.161	24.625	9.213	4.40	2.20	192445
		2.5	3.602	4.589	17.115	1.931	6.846	27.532	10.216	5.00	2.50	191415
		2.75	3.927	5.003	18.489	1.922	7.396	29.872	11.009	5.50	2.75	190557

3.0	4.245	5.408	19.821	1.914	7.929	32.135	11.765	6.00	3.00	189.699
3.5	4.863	6.195	22.384	1.901	8.954	36.431	13.168	7.00	3.50	187.982
3.75	5.162	6.575	23.628	1.896	9.451	38.463	13.816	7.50	3.75	187.123
4	5.454	6.948	24.856	1.891	9.942	40.418	14.431	8.00	4.00	186.265
4.5	6.020	7.669	27.296	1.887	10.918	44.094	15.560	9.00	4.50	184.548
4.75	6.293	8.016	28.525	1.886	11.410	45.815	16.076	9.50	4.75	183.690

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m

B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
60	±0.60	2.0	3.562	4.537	25.212	2.357	8.404	39.786	12.594	4.00	2.00	233.132
		2.2	3.895	4.962	27.374	2.349	9.125	43.386	13.668	4.40	2.20	232.445
		2.5	4.387	5.589	30.513	2.337	10.171	48.656	15.219	5.00	2.50	231.415
		2.75	4.791	6.103	33.039	2.327	11.013	52.928	16.459	5.50	2.75	230.557
		3.0	5.187	6.608	35.489	2.317	11.830	57.091	17.652	6.00	3.00	229.699
		3.5	5.962	7.595	40.190	2.300	13.397	65.088	19.901	7.00	3.50	227.982
		3.75	6.339	8.075	42.454	2.293	14.151	68.921	20.959	7.50	3.75	227.123
		4.0	6.710	8.548	44.671	2.286	14.890	72.644	21.973	8.00	4.00	226.265
		4.5	7.433	9.46	48.99	2.27	16.3	79.75	23.87	9.00	4.50	224

				9	4	5	31	7	5			548
		4.75	7.784	9.916	51.118	2.270	17.039	83.146	24.764	9.50	4.75	223690
		5.0	8.130	10.356	53.228	2.267	17.743	86.424	25.612	10.00	5.00	222831
70	±0.65	2.5	5.172	6.589	49.581	2.743	14.166	78.485	21.222	5.00	2.50	271415
		2.75	5.654	7.203	53.788	2.733	15.368	85.528	23.008	5.50	2.75	270557
		3.0	6.129	7.808	57.881	2.723	16.537	92.423	24.738	6.00	3.00	269699
		3.5	7.061	8.995	65.748	2.704	18.785	105.768	28.031	7.00	3.50	267982
		3.75	7.517	9.575	69.537	2.695	19.868	112.217	29.597	7.50	3.75	267123
		4.0	7.966	10.148	73.240	2.686	20.926	118.517	31.110	8.00	4.00	266265
		4.5	8.846	11.2	80.42	2.67	22.9	130.6	33.98	9.00	4.50	264

			69	1	1	78	67	1			548
	4.75	9.276	11.816	83.917	2.665	23.976	136.516	35.340	9.50	4.75	263690
	5.0	9.700	12.356	87.363	2.659	24.961	142.213	36.651	10.00	5.00	262831

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
75	±0.65	2.5	5.565	7.089	61.553	2.947	16.414	97.133	24.598	5.00	2.50	291415
		3.0	6.600	8.408	71.973	2.926	19.193	114.543	28.730	6.00	3.00	289699
		4.0	8.594	10.948	91.307	2.888	24.349	147.321	36.277	8.00	4.00	286265

		5.0	10.485	13.356	109.059	2.858	29.083	177.354	42.916	10.00	5.00	282831
80	±0.70	2.5	5.957	7.589	75.318	3.150	18.830	118.520	28.224	5.00	2.50	311415
		2.75	6.518	8.303	81.838	3.140	20.460	129.322	30.656	5.50	2.75	310557
		3.0	7.071	9.008	88.197	3.129	22.049	139.931	33.022	6.00	3.00	309699
		3.5	8.160	10.395	100.458	3.109	25.115	160.571	37.559	7.00	3.50	307982
		3.75	8.694	11.075	106.376	3.099	26.594	170.601	39.732	7.50	3.75	307123
		4.0	9.222	11.748	112.163	3.090	28.041	180.436	41.843	8.00	4.00	306265
		4.5	10.259	13.069	123.378	3.073	30.844	199.522	45.881	9.00	4.50	304548
		4.75	10.767	13.716	128.824	3.065	32.206	208.772	47.810	9.50	4.75	303690

		5.0	11.270	14.356	134.176	3.057	33.544	217.826	49.680	10.00	5.00	30283
		5.5	12.255	15.611	144.636	3.044	36.159	235.344	53.249	11.00	5.50	301
		5.75	12.737	16.226	149.767	3.038	37.442	243.807	54.948	11.50	5.75	300
		6.0	13.214	16.830	149.24	2.980	37.31	252.070	56.590	12.00	6.00	299
9	±0.75	3.0	8.013	10.208	127.637	3.536	28.364	201.415	42.506	6.00	3.00	349
0												699
		4.0	10.478	13.348	163.040	3.495	36.231	260.801	54.173	8.00	4.00	34626
		5.0	12.840	16.356	195.667	3.459	43.481	316.260	64.705	10.00	5.00	34283
		6.0	15.098	19.233	226.146	3.429	50.255	367.762	74.159	12.00	6.00	339
												398

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
90	±0.75	8.0	18.873	24.040	255.070	3.260	56.680	455.590	88.830	20.00	12.00	325663
100	±0.80	3.5	10.358	13.195	202.936	3.922	40.587	320.945	60.810	7.00	3.50	387982
		3.75	11.049	14.075	215.324	3.911	43.065	341.629	64.497	7.50	3.75	387123
		4.0	11.734	14.948	227.471	3.901	45.494	362.012	68.101	8.00	4.00	386265
		4.5	13.085	16.669	251.079	3.881	50.216	401.871	75.070	9.00	4.50	384548
		4.75	13.750	17.516	262.558	3.872	52.512	421.346	78.436	9.50	4.75	383690
		5.0	14.41	18.35	273.83	3.86	54.76	440.51	81.724	10.0	5.00	382

			0	6	6	2	7	7		0		831
		5.5	15.709	20.011	295.827	3.845	59.165	477.947	88.071	11.00	5.50	381114
		5.75	16.348	20.826	306.563	3.837	61.313	496.205	91.132	11.50	5.75	380256
		6.0	16.982	21.633	317.143	3.829	63.429	514.156	94.119	12.00	6.00	379398
		8.0	21.385	27.240	366.430	3.670	73.290	644.510	114.230	20.00	12.00	365663
		10.0	25.565	32.570	412.260	3.560	82.450	749.840	130.100	25.00	15.00	357079
11	±0.90	4.0	12.990	16.548	307.056	4.308	55.828	486.469	83.628	8.00	4.00	426
0												265
		5.0	15.980	20.356	370.683	4.267	67.397	593.596	100.741	10.00	5.00	422831
		6.0	18.866	24.033	430.236	4.231	78.225	694.854	116.472	12.00	6.00	419398
		8.0	23.89	30.44	506.12	4.08	92.02	878.70	142.82	20.0	12.0	405

			7	0	0	0	0	0	0	0	0	663
		10.0	28.705	36.570	575.980	3.970	104.72	1032.260	164.330	25.000	15.000	397079
120	±0.90	3.5	12.556	15.995	358.823	4.736	59.804	563.011	89.658	7.000	3.500	467982
		3.75	13.404	17.075	381.298	4.725	63.550	600.008	95.257	7.500	3.750	467123
		4.0	14.246	18.148	403.396	4.715	67.233	636.572	100.754	8.000	4.000	466265

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
120	*±0.90*	4.5	15.9	20.2	446.4	4.6	74.41	708.4	111.4	9.0	4.5	4645

	11	69	97	94	6	03	50	0	0	48
4.75	16.733	21.316	467.521	4.683	77.920	743.667	116.651	9.50	4.75	463690
5.0	17.550	22.356	488.208	4.673	81.368	778.497	121.755	10.00	5.00	462831
5.5	19.163	24.411	528.619	4.653	88.103	846.850	131.675	11.00	5.50	461114
5.75	19.959	25.426	548.367	4.644	91.394	880.372	136.494	11.50	5.75	460256
6.0	20.750	26.433	567.826	4.635	94.638	913.456	141.219	12.00	6.00	459398
7.5	24.978	31.819	679.264	4.620	113.211	1104.351	166.685	18.75	11.25	447809
7.75	25.697	32.735	698.355	4.619	116.393	1133.907	170.681	19.38	11.63	446736
8.0	26.409	33.642	717.484	4.618	119.581	1162.951	174.584	20.00	12.00	445663

		10.0	31.845	40.570	777.990	4.380	129.660	1376.410	202.520	25.00	15.00	437079
130	±1.00	4.0	15.502	19.748	518.089	5.122	79.706	814.722	119.479	8.00	4.00	506265
		5.0	19.120	24.356	628.411	5.079	96.679	998.220	144.766	10.00	5.00	502831
		6.0	22.634	28.833	732.312	5.040	112.663	1173.562	168.363	12.00	6.00	499398
		6.2	23.065	29.383	746.518	5.041	114.849	1211.925	172.335	15.50	9.30	493389
		8.0	28.921	36.842	923.462	5.007	142.071	1502.067	209.540	20.00	12.00	485663
		10.0	34.985	44.570	1022.280	4.790	157.270	1788.290	244.700	25.00	15.00	477079
140	±1.10	3.5	14.754	18.795	579.318	5.552	82.760	903.567	124.104	7.00	3.50	547982
		3.75	15.7	20.0	616.2	5.5	88.04	963.7	132.0	7.5	3.7	547

		59	75	97	41	2	35	14	0	5	123
	4.0	16.7 58	21.3 48	652.7 36	5.5 30	93.24 8	1023. 317	139.8 04	8.0 0	4.0 0	5462 65
	4.5	18.7 37	23.8 69	724.0 31	5.5 08	103.4 33	1140. 718	155.0 25	9.0 0	4.5 0	544 548

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
140	± 1.10	4.75	19.7 16	25.1 16	758.9 11	5.4 97	108.4 16	1198. 536	162.4 59	9.5 0	4.7 5	5436 90
		5.0	20.6 90	26.3 56	793.2 93	5.4 86	113.3 28	1 255.765	169.7 77	10. 00	5.0 0	5428 31

		5.5	22.617	28.811	860.614	5.465	122.945	1368.452	184.067	11.00	5.50	541114
		5.75	23.570	30.026	893.578	5.455	127.654	1423.908	191.042	11.50	5.75	540256
		6.0	24.518	31.233	926.095	5.445	132.299	1478.772	197.904	12.00	6.00	539398
		7.5	29.688	37.819	1106.258	5.408	158.037	1800.718	235.797	18.75	11.25	527809
		7.75	30.564	38.935	1136.885	5.404	162.412	1851.117	241.797	19.38	11.63	526736
		8.0	31.433	40.042	1167.381	5.399	166.769	1900.844	247.686	20.00	12.00	525663
150	*±1.20*	3.5	15.853	20.195	717.295	5.960	95.639	1116.029	143.426	7.00	3.50	587982
		3.75	16.937	21.575	763.432	5.948	101.791	1190.730	152.642	7.50	3.75	587123
		4.0	18.0	22.9	808.9	5.9	107.8	1264.	161.7	8.0	4.0	586

	14	48	37	37	58	758	28	0	0	265
4.5	20.150	25.669	898.093	5.915	119.746	1410.794	179.511	9.00	4.50	584548
4.75	21.208	27.016	941.766	5.904	125.569	1482.801	188.212	9.50	4.75	583690
5.0	22.260	28.356	984.852	5.893	131.314	1554.132	196.786	10.00	5.00	582831
5.5	24.344	31.011	1069.312	5.872	142.575	1694.764	213.560	11.00	5.50	581114
5.75	25.376	32.326	1110.711	5.862	148.095	1764.064	221.762	11.50	5.75	580256
6.0	26.402	33.633	1151.574	5.851	153.543	1832.685	229.843	12.00	6.00	579398
7.5	32.043	40.819	1376.431	5.807	183.524	2237.541	274.843	18.75	11.25	567809
7.75	32.998	42.035	1414.549	5.801	188.606	2301.192	281.995	19.38	11.63	566736

	8.0	33.945	43.242	1452.441	5.796	193.659	2364.083	289.025	20.00	12.00	5656.63

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
150	*±1.20*	10.0	41.265	52.570	1653.710	5.610	220.490	2839.240	340.980	25.00	15.00	5570.79
		12.0	47.147	60.060	1784.840	5.450	237.980	3230.570	380.010	36.00	24.00	5381.94
160	*±1.20*	3.5	16.952	21.595	875.623	6.368	109.453	1359.415	164.148	7.00	3.50	627.982
		3.75	18.114	23.075	932.323	6.356	116.540	1450.812	174.770	7.50	3.75	627.123

4.0	19.270	24.548	988.292	6.345	123.536	1541.446	185.251	8.00	4.00	626265
4.5	21.563	27.469	1098.083	6.323	137.260	1720.417	205.797	9.00	4.50	624548
4.75	22.699	28.916	1151.929	6.312	143.991	1808.752	215.863	9.50	4.75	623690
5.0	23.830	30.356	1205.090	6.301	150.636	1896.321	225.794	10.00	5.00	622831
5.5	26.071	33.211	1309.411	6.279	163.676	2069.151	245.252	11.00	5.50	621114
5.75	27.181	34.626	1360.596	6.268	170.074	2154.412	254.781	11.50	5.75	620256
7.5	34.398	43.819	1688.389	6.207	211.049	2739.456	316.884	18.75	11.25	607809
7.75	35.431	45.135	1735.279	6.201	216.910	2818.446	325.286	19.38	11.63	606736
8.0	36.4	46.4	1781.	6.1	222.7	2896.	333.5	20.	12.	605

			57	42	843	94	30	583	58	00	00	663
		10.0	44.405	56.570	2048.850	6.020	256.110	3490.290	395.100	25.00	15.00	5970.79
		12.0	50.915	64.860	2229.430	5.860	278.680	3996.720	443.130	36.00	24.00	578.194
170	*±1.30*	4.0	20.526	26.148	1192.401	6.753	140.282	1855.779	210.374	8.00	4.00	666.265
		5.0	25.400	32.356	1456.006	6.708	171.295	2285.331	256.801	10.00	5.00	6628.31
		6.0	30.170	38.433	1707.222	6.665	200.850	2701.023	300.913	12.00	6.00	6593.98
		8.0	38.969	49.642	2158.785	6.594	253.975	3503.142	381.285	20.00	12.00	645.663
		10.0	47.545	60.570	2502.270	6.430	294.380	4233.070	453.210	25.00	15.00	637.079

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

5

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
170	±1.30	12.0	54.683	69.660	2741.970	6.270	322.580	4872.550	511.030	36.00	24.00	618.194
180	±1.40	3.5	19.150	24.395	1258.937	7.184	139.882	1947.353	209.791	7.00	3.50	707.982
		3.75	20.469	26.075	1341.374	7.172	149.042	2079.239	223.524	7.50	3.75	707.123
		4.0	21.782	27.748	1422.864	7.161	158.096	2210.159	237.097	8.00	4.00	706.265
		4.5	24.389	31.069	1583.052	7.138	175.895	2469.098	263.766	9.00	4.50	704.548
		4.75	25.6	32.7	1	7.1	184.6	2597.	276.8	9.5	4.7	703

	82	16	661.775	27	42	116	64	0	5	690
5.0	26.970	34.356	1739.600	7.116	193.289	2724.164	289.807	10.00	5.00	7028 31
5.5	29.525	37.611	1892.609	7.094	210.290	2975.35	315.231	11.00	5.50	701 114
5.75	30.792	39.226	1967.821	7.083	218.647	3099.485	327.714	11.50	5.75	700 256
6.0	32.054	40.833	2042.190	7.072	226.910	3222.648	340.046	12.00	6.00	6993 98
7.5	39.108	49.819	2449.657	7.012	272.184	3956.561	409.954	18.75	11.25	687 809
7.75	40.298	51.335	2518.339	7.004	279.815	4 073.090	421.155	19.38	11.63	686 736
8.0	41.481	52.842	2586.469	6.996	287.385	4 188.562	432.207	20.00	12.00	685 663
10.0	50.685	64.570	3017.980	6.840	335.330	5 073.570	515.310	25.00	15.00	6770 79

		12.0	58.451	74.460	3327.260	6.680	369.700	5865.260	583.710	36.00	24.00	658194
190	±1.50	4.0	23.038	29.348	1681.281	7.569	176.977	2606.984	265.419	8.00	4.00	746265
		5.0	28.540	36.356	2057.872	7.524	216.618	3215.819	324.813	10.00	5.00	7428 31
		6.0	33.938	43.233	2418.455	7.479	254.574	3807.375	381.578	12.00	6.00	739398
		8.0	43.993	56.042	3068.095	7.399	322.957	4957.642	486.325	20.00	12.00	725663
		10.0	53.825	68.570	3599.970	7.250	378.940	6017.790	581.400	25.00	15.00	7170 79

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius	Nominal inner arc radius	Surface area per meter length

			kg/m							mm	mm	mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
190	±1.50	12.0	62.219	79.260	3990.100	7.100	420.010	6982.040	661.170	36.00	24.00	698194
200	±1.60	3.5	21.348	27.195	1740.460	8.000	174.046	2684.182	261.034	7.0	3.5	7879 82
		3.75	22.824	29.075	1855.450	7.988	185.545	2867.014	278.278	7.5	3.75	787123
		4.0	24.294	30.948	1969.252	7.977	196.925	3048.656	295.341	8.0	4.0	786265
		4.5	27.215	34.669	2193.338	7.954	219.334	3408.363	328.933	9.0	4.5	784548
		4.75	28.665	36.516	2303.649	7.943	230.365	3586.426	345.463	9.5	4.75	7836 90
		5.0	30.110	38.356	2412.822	7.931	241.282	3763.295	361.818	10.00	5.0	7828 31
		5.5	32.9	42.0	2627.	7.9	262.7	4	394.0	11.	5.5	781

	79	11	810	09	81	113.446	07	00	0	114
5.75	34.403	43.826	2733.653	7.898	273.365	4286.726	409.843	11.50	5.75	780256
6.0	35.822	45.633	2838.417	7.887	283.842	4458.807	425.508	12.00	6.00	779398
7.5	43.818	55.819	3414.062	7.821	341.406	5488.032	515.011	18.75	11.25	767809
7.75	45.165	57.535	3510.865	7.812	351.086	5652.247	529.410	19.38	11.63	766736
8.0	46.505	59.242	3606.861	7.803	360.686	5815.182	543.640	20.00	12.00	765663
9.5	54.394	69.291	4167.935	7.756	416.794	6765.513	625.509	23.75	14.25	759225
9.75	55.683	70.933	4259.319	7.749	425.932	6919.292	638.576	24.38	14.63	758152
10.0	56.965	72.566	4350.202	7.743	435.020	7071.735	651.480	25.00	15.00	757079

		12.0	65.9 87	84.0 60	4 735.290	7.5 10	473.5 30	8230. 100	743.4 20	36. 00	24. 00	738 194
220	±*1.80*	5.0	33.2 50	42.3 56	3240. 756	8.7 47	294.6 14	5 037.714	441.8 27	10. 00	5.0 0	8628 31
		6.0	39.5 90	50.4 33	3819. 029	8.7 02	347.1 84	5 976.181	520.5 67	12. 00	6.0 0	8593 98
		8.0	51.5 29	65.6 42	4 868.618	8.6 12	442.6 02	7 814.839	667.8 61	20. 00	12. 00	845 663

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
220	±*1.80*	10.0	63.2	80.5	5881.	8.5	534.	9	803.6	25.	15.	837

			45	66	597	44	691	532.773	22	00	00	079
		12.0	73.5	93.6	6879.	8.5	625.	11	922.2	36.	24.	8181
			23	59	863	71	442	148.806	79	00	00	94
240	*±1.90*	5.0	36.3	46.3	4	9.5	353.	6	529.8	10.	5.0	9428
			90	56	239.403	63	284	571.421	35	00	0	31
		6.0	43.3	55.2	5	9.5	416.	7803.5	625.2	12.	6.0	9393
			58	33	003.227	18	936	69	22	00	0	98
		8.0	56.5	72.0	6397.	9.4	533.	10	804.8	20.	12.	925
			53	42	340	23	112	225.933	73	00	00	663
		10.0	69.5	88.5	7	9.3	645.	12	971.7	25.	15.	917
			25	66	742.125	50	177	504.687	43	00	00	079
		12.0	81.0	103.	9	9.3	751.	14678.	1120.	36.	24.	898
			59	259	023.491	48	958	963	294	00	00	194
250	*±2.00*	4.5	34.2	43.6	4	9.9	348.	6	523.3	9.0	4.5	984
			80	69	361.815	94	945	732.075	46	0	0	548
		4.75	36.1	46.0	4	9.9	366.	7	550.2	9.5	4.7	983
			23	16	585.706	83	856	088.471	05	0	5	690

5.0	37.960	48.356	4807.743	9.971	384.619	7443.007	576.838	10.00	5.00	982831
5.5	41.614	53.011	5246.320	9.948	419.706	8146.491	629.436	11.00	5.50	981114
5.75	43.431	55.326	5462.890	9.937	437.031	8495.438	655.402	11.50	5.75	980256
6.0	45.242	57.633	5677.671	9.925	454.214	8842.518	681.149	12.00	6.00	979398
7.5	55.593	70.819	6871.300	9.850	549.704	10928.305	830.117	18.75	11.25	967809
7.75	57.333	73.035	7071.339	9.840	565.707	11264.004	854.255	19.38	11.63	966736
8.0	59.065	75.242	7269.813	9.829	581.585	11597.769	878.176	20.00	12.00	965663
9.5	69.309	88.291	8429.888	9.771	674.391	13559.256	1017.170	23.75	14.25	959225
9.75	70.9	90.4	8618.	9.7	689.	13	1	24.	14.	9581

		90	33	475	62	478	879.240	039.589	38	63	52
	10.0	72.6 65	92.5 66	8805. 814	9.7 53	704. 465	14197. 22	1 061.797	25. 00	15. 00	9570 79
	11.5	81.6 67	104. 034	9880. 719	9.7 46	790. 458	16 090.585	1185. 854	34. 50	23. 00	940 769

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
250	± 2.00	11.75	83. 251	106. 052	10066. 633	9.7 43	805.3 31	16392. 127	1 206.281	35. 25	23. 50	939 482
		12.0	84.	108.	10252.	9.7	820.1	16	1	36.	24.	938

			827	059	429	41	94	691.331	226.488	00	00	194
260	±2.10	5.0	39.530	50.356	5424.762	10.379	417.289	8388.415	625.841	10.00	5.00	1022831
		6.0	47.126	60.033	6 410.211	10.333	493.093	9 969.771	739.475	12.00	6.00	1019398
		8.0	61.577	78.442	8218.626	10.236	632.202	13 086.864	954.677	20.00	12.00	1005663
		10.0	75.805	96.566	9 963.786	10.158	766.445	16 035.472	1 155.847	25.00	15.00	997079
		12.0	88.595	112.859	11 592.517	10.135	891.732	18 878.157	1 337.475	36.00	24.00	978194
280	±2.20	4.5	38.519	49.069	6 175.653	11.219	441.118	9 503.251	661.592	9.00	4.50	1104548
		4.75	40.597	51.716	6 495.424	11.207	463.959	10 009.139	695.847	9.50	4.75	1103690
		5.0	42.670	54.356	6812.833	11.195	486.631	10 512.697	729.847	10.00	5.00	1102831

5.5	46.795	59.611	7440.632	11.172	531.474	11512.813	797.089	11.00	5.50	1101.114
5.75	48.847	62.226	7751.054	11.161	553.647	12009.369	830.332	11.50	5.75	1100.256
6.0	50.894	64.833	8059.181	11.149	575.656	12503.588	863.327	12.00	6.00	1099.398
7.5	62.658	79.819	9783.055	11.071	698.790	15477.561	1055.164	18.75	11.25	1087.809
7.75	64.633	82.335	10071.620	11.060	719.401	15957.992	1086.343	19.38	11.63	1086.736
8.0	66.601	84.842	10358.078	11.049	739.863	16436.032	1117.275	20.00	12.00	1085.663
9.5	78.258	99.691	12034.746	10.987	859.625	19253.527	1297.726	23.75	14.25	1079.225
9.75	80.175	102.133	12307.554	10.977	879.111	19714.562	1326.952	24.38	14.63	1078.152
10.0	82.	104.	12578.	10.	898.4	20173.	1355.	25.	15.	1077

		085	566	579	968	70	130	938	00	00	079
	11.5	92.500	117.834	14098.357	10.938	1007.025	22 927.523	1520.069	34.50	23.00	1 060 769

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
280	± 2.20	11.75	94.319	120.152	14362.195	10.933	1025.871	23367.161	1547.073	35.25	23.50	1059 482
		12.0	96.131	122.459	14625.343	10.928	1044.667	23 803.979	1 573.828	36.00	24.00	1058 194
300	± 2.40	5.5	50.249	64.011	9 199.842	11.988	613.323	14 206.400	919.856	11.00	5.50	1181 114

5.75	52.458	66.826	9 585.922	11.977	639.061	14 821.449	958.451	11.50	5.75	1180 256
6.0	54.662	69.633	9 969.337	11.965	664.622	15 433.819	996.777	12.00	6.00	1179 398
7.5	67.368	85.819	12 123.146	11.885	808.210	19 120.852	1 220.190	18.75	11.25	1167 809
7.75	69.500	88.535	12 483.472	11.874	832.231	19 717.705	1 256.563	19.38	11.63	1166 736
8.0	71.625	91.242	12 841.295	11.863	856.086	20 311.836	1 292.669	20.00	12.00	1165 663
9.5	84.224	107.291	14 937.854	11.799	995.857	23 818.883	1503.751	23.75	14.25	1159 225
9.75	86.298	109.933	15 279.267	11.789	1018.618	24 393.672	1538.014	24.38	14.63	1158 152
10.0	88.365	112.566	15 618.505	11.779	1 041.234	24 965.657	1572.017	25.00	15.00	1157 079
11.5	99.7	127.	17	11.	1167.	28	1765.	34.	23.	1140

			22	034	505.808	739	054	414.519	855	50	00	769
		11.75	101.698	129.552	17 833.643	11.733	1188.910	28 965.855	1797.741	35.25	23.50	1139482
		12.0	103.667	132.059	18 160.367	11.727	1210.691	29 514.024	1829.359	36.00	24.00	1138194
320	±2.50	6.0	58.430	74.433	12 159.878	12.782	759.992	18 789.264	1139.825	12.00	6.00	1259398
		8.0	76.649	97.642	15 693.876	12.678	980.867	24 752.675	1480.859	20.00	12.00	1245663
		10.0	94.645	120.566	19 115.564	12.592	1194.723	30461.055	1804.087	25.00	15.00	1237079
		12.0	111.203	141.659	22 235.99	12.529	1389.749	36 065.887	2104.071	36.00	24.00	1218194
350	±2.80	5.5	58.884	75.011	14 763.377	14.029	843.622	22 705.671	1265.27	11.00	5.50	1381114
		5.75	61.486	78.326	15390.248	14.017	879.443	23696.010	1318.993	11.50	5.75	1380256

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Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
350	± 2.80	6.0	64.082	81.633	16013.414	14.006	915.052	24682.709	1372.397	12.00	6.00	1379.398
		7.5	79.143	100.819	19544.599	13.923	1116.834	30628.171	1685.243	18.75	11.25	1367.809
		7.75	81.668	104.035	20134.763	13.912	1150.558	31594.596	1736.348	19.38	11.63	1366.736
		8.0	84.185	107.242	20721.308	13.900	1184.075	32557.376	1787.137	20.00	12.00	1365.663
		9.5	99.1	126.	24	13.	1380.	38	2085.	23.	14.	1359

			39	291	166.835	833	962	256.883	284	75	25	225
		9.75	101.605	129.433	24729.196	13.822	1413.097	39193.827	2133.886	24.38	14.63	1358152
		10.0	104.065	132.566	25288.277	13.812	1445.044	40127.031	2182.179	25.00	15.00	1357079
		11.5	117.777	150.034	28377.695	13.753	1621.583	45786.119	2460.752	34.50	23.00	1340769
		11.75	120.146	153.052	28913.519	13.745	1652.201	46694.158	2506.589	35.25	23.50	1339482
		12.0	122.507	156.059	29447.048	13.736	1682.688	47598.083	2552.109	36.00	24.00	1338194
400	*±3.20*	7.5	90.918	115.819	29510.659	15.962	1475.533	46012.760	2225.284	18.75	11.25	1567809
		7.75	93.835	119.535	30412.713	15.951	1520.636	47475.924	2293.619	19.38	11.63	1566736
		8.0	96.745	123.242	31309.852	15.939	1565.493	48934.389	2361.589	20.00	12.00	1565663

9.5	114.054	145.291	36 591.831	15.870	1829.592	57 585.752	2761.785	23.75	14.25	1559 225
9.75	116.913	148.933	37 455.761	15.859	1872.788	59010.948	2827.223	24.38	14.63	1558 152
10.0	119.765	152.566	38 315.128	15.847	1915.756	60 431.336	2892.302	25.00	15.00	1557 079
11.5	135.832	173.034	43 071.379	15.777	2153.569	69 067.850	3270.582	34.50	23.00	1540 769
11.75	138.593	176.552	43893.762	15.768	2194.688	70458.248	3332.863	35.25	23.50	1539 482
12.0	141.347	180.059	44 712.473	15.758	2235.624	71 843.465	3394.779	36.00	24.00	1538 194
13.5	157.697	200.888	49 553.092	15.706	2477.655	80044.346	3758.645	40.50	27.00	1530 468

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

II

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
400	*±3.20*	13.75	160.393	204.323	50348.869	15.698	2517.443	81392.490	3818.022	41.25	27.50	1529.181
		14.0	163.082	207.748	51141.787	15.690	2557.089	82735.223	3877.039	42.00	28.00	1527.893
450	*±3.60*	7.5	102.693	130.819	42396.326	18.002	1884.281	65837.119	2840.315	18.75	11.25	1767.809
		7.75	106.003	135.035	43704.821	17.990	1942.436	67942.940	2928.381	19.38	11.63	1766.736
		8.0	109.305	139.242	45006.927	17.979	2000.308	70042.874	3016.030	20.00	12.00	1765.663
		9.5	128.	164.	52	17.	2341.	82	3533.	23.	14.	1759

	969	291	687.841	908	682	517.987	265	75	25	225
9.75	132.220	168.433	53 946.462	17.896	2397.621	84576.282	3618.036	24.38	14.63	1758152
10.0	135.465	172.566	55 199.058	17.885	2453.291	86628.568	3702.400	25.00	15.00	1757079
11.5	153.887	196.034	62 161.860	17.807	2762.749	99 122.192	4 195.364	34.50	23.00	1740769
11.75	157.041	200.052	63 361.871	17.797	2816.083	101 139.354	4 276.586	35.25	23.50	1739482
12.0	160.187	204.059	64 556.641	17.787	2869.184	103 150.146	4357.394	36.00	24.00	1738194
13.5	178.892	227.888	71 620.736	17.728	3 183.144	115 079.34	4 833.582	40.50	27.00	1730468
13.75	181.981	231.823	72 781.626	17.719	3 234.739	117 044.645	4 911.509	41.25	27.50	1729181
14.0	185.062	235.748	73 938.097	17.710	3286.138	119 003.324	4 989.026	42.00	28.00	1727893

500	±4.00	7.5	114.468	145.819	58576	20.043	2 343.064	90663.746	3 530.341	18.75	11.25	1967 809
		7.75	118.170	150.535	60398	20.031	2 415.943	93576.892	3 640.635	19.38	11.63	1966 736
		8.0	121.865	155.242	62212	20.019	2 488.501	96 482.828	3 750.463	20.00	12.00	1965 663
		9.5	143.884	183.291	72 929	19.947	2917.195	113 766.086	4399.730	23.75	14.25	1959 225
		9.75	147.528	187.933	74688	19.935	2987.552	116 621.078	4 506.333	24.38	14.63	1958 152
		10.0	151.165	192.566	76440	19.924	3 057.603	119 468.724	4 612.479	25.00	15.00	1 957 079

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (cont.)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius	Nominal inner arc radius	Surface area per meter length

			m							mm	mm	mm²/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
500	±4.00	11.5	171.942	219.034	862.24	19.841	3448.966	136.811.635	5 235.113	34.50	23.00	1940.769
		11.75	175.488	223.552	87 905	19.830	3 516.214	139 618.713	5337.772	35.25	23.50	1939.482
		12.0	179.027	228.059	895.79	19.819	3 583.182	142 418.113	5439.969	36.00	24.00	1938.194
		13.5	200.087	254.888	994.83	19.756	3 979.334	159 051.290	6 043.457	40.50	27.00	1930.468
		13.75	203.568	259.323	101 111	19.746	4 044.455	161 795.948	6 142.429	41.25	27.50	1929.181
		14.0	207.042	263.748	102 733	19.736	4 109.330	164 532.644	6 240.943	42.00	28.00	1927.893
		15.5	227.712	290.078	112 341	19.679	4 493.653	180 783.600	6 822.436	46.50	31.00	1920.167
		15.75	231.	294.	113	19.	4	183	6	47.	31.	1918

			128	431	923	670	556.931	463.556	917.758	25	50	880
		16.0	234.536	298.772	115499	19.662	4619.999	186135.263	7012.627	48.00	32.00	1917592
		18.0	261.510	333.134	127941	19.690	5117.654	207207.648	7755.309	54.00	36.00	1907291
		20.0	287.963	366.832	140126	19.610	5605.051	227731.612	8469.255	60.00	40.00	1896990
		25.0	351.817	448.175	169984	19.420	6799.385	247688.871	9154.712	75.00	50.00	1871238
600	±5.00	16.0	284.776	362.772	204030	23.850	6801.028	326005.339	10328.637	48.00	32.00	2317592
		18.0	318.030	405.134	226356	23.770	7545.229	363707.468	11457.379	54.00	36.00	2307291
		20.0	350.763	446.832	248168	23.690	8272.282	400659.286	12551.150	60.00	40.00	2296990
		24.0	414.667	528.238	290565	23.540	9685.529	472224.270	14634.873	72.00	48.00	2276388

		25.0	430.317	548.175	300.973	23.500	10032.458	475273.437	14553.673	75.00	50.00	2271.238
700	±6.00	16.0	335.016	426.772	329.388	27.930	9411.095	512021.606	13958.994	48.00	32.00	2717.592
		18.0	374.55	477.134	365.981	27.850	10456.602	570986.222	15476.512	54.00	36.00	2707.291
		20.0	413.563	526.832	401.752	27.770	11478.635	644046.035	17432.549	60.00	40.00	2 696.990

Table 1 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of square steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
B	$\pm\Delta$	t	M	A	$I_x = I_y$	$r_x = r_y$	$W_x = W_y$	I_t	C_t	R	r	A_s
700	±6.00	24.0	490.027	624.238	471152.610	27.461.507	13	76156 9.164	20416.871	72.00	48.00	267 6388

		25.0	508.8	648.	488	27.	13	768	20	75.	50.	267
			17	175	121	580	946.330	867.187	423.328	00	00	1238
800	±*7.00*	16.0	385.2	490.	497	32.	12	771	18	48.	32.	311
			56	772	972	010	449.311	024.486	499.760	00	00	7592
		18.0	431.0	549.	554	31.	1385	860	20	54.	36.	310
			70	134	013	930	0.350	781.182	548.581	00	00	7291
		20.0	476.3	606.	608	31.	15	969	23	60.	40.	309
			63	832	877	850	221.939	891.590	113.624	00	00	6 990
		24.0	565.3	720.	715	31.	17	1 149	27	72.	48.	307
			87	238	399	700	884.988	495.208	158.232	00	00	6388
		25.0	587.3	748.	741	31.	1853	1 163	27	75.	50.	3
			17	175	428	660	5.703	710.938	292.088	00	00	071 238
900	±*8.00*	20.0	539.1	686.	877	35.	1950	13629	28	60.	40.	349
			63	832	544	940	0.989	44.000	937.418	00	00	6990
		24.0	640.7	816.	1	35.	22	1 613	33	72.	48.	347
			47	238	032 906	780	953.470	331.302	945.979	00	00	6388
		25.0	665.8	848.	107	35.	23	1 674	35	75.	50.	347

			17	175	0893	740	797.632	804.688	160.235	00	00	1238
		30.0	789.2	100	125	35.	27	1975	41	90.	60.	344
			17	5.372	6352	540	918.951	509.000	010.277	00	00	5486
		36.0	933.0	118	147	35.	32	2321	47	108	72.	3
			00	8.535	0989	300	688.659	901.158	559.091	.00	00	414 583
		40.0	1026.	130	161	35.	3579	2 544	5165	120	80.	339
			252	7.327	0932	150	8.504	224.000	0.740	.00	00	3 981
1000	*±9.00*	25.0	744.3	948.	148	39.	29	2 317	44	75.	50.	387
			17	175	6517	820	730.350	148.438	027.948	00	00	1238
		30.0	883.4	112	174	39.	34	27380	51	90.	60.	384
			17	5.372	6580	620	931.617	19.000	500.880	00	00	5486
		36.0	1046.	1	204	39.	40	32250	59	108	72.	381
			040	332.535	7061	380	941.234	28.838	931.772	.00	00	4583
		40.0	1151.	1	224	39.	44	3 538	65	120	80.	379
			852	467.327	2020	230	840.410	944.000	238.808	.00	00	3981
		50.0	1407.	179	271	38.	5439	4 286	7746	150	100	3
			269	2.699	9753	840	5.080	875.000	1.029	.00	.00	742 477

Note 1: Sectional parameters for specifications with side lengths *500* mm and above in the table have been rounded. Note 2: r are calculated values $R-t$, not measured values.

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
30	20	*±0.50*	1.5	1.061	1.352	1.608	0.862	1.091	0.799	1.072	0.862	1.830	1.397	3.00	1.50	94.849
			1.7	1.185	1.510	1.773	0.953	1.084	0.794	1.182	0.953	2.024	1.529	3.40	1.70	94.162
			1.8	1.246	1.587	1.852	0.998	1.080	0.793	1.235	0.998	2.116	1.591	3.60	1.80	93.819
			2.0	1.	1.	2.	1.	1.	0.	1.	1.	2.	1.	4	2.	93

				364	737	007	087	075	791	338	087	292	707	.00	00	132
			2.2	1.	1.	2.	1.	1.	0.	1.	1.	2.	1.	4	2.	92
				477	882	157	179	071	791	438	179	455	812	.40	20	445
			2.5	1.	2.	2.	1.	1.	0.	1.	1.	2.	1.	5	2.	91
				640	089	379	322	067	796	586	322	678	950	.00	50	415
40	20	±*0.50*	1.5	1.	1.	3.	1.	1.	0.	1.	1.	2.	1.	3	1.	11
				297	652	288	119	411	823	644	119	742	910	.00	50	4 849
			1.7	1.	1.	3.	1.	1.	0.	1.	1.	3.	2.	3	1.	11
				452	850	633	238	401	818	816	238	039	099	.40	70	4 162
			1.8	1.	1.	3.	1.	1.	0.	1.	1.	3.	2.	3	1.	11
				528	947	799	297	397	816	900	297	181	188	.60	80	3819
			2.0	1.	2.	4.	1.	1.	0.	2.	1.	3.	2.	4	2.	11
				678	137	12	413	388	813	060	413	453	355	.00	00	3 132
			2.2	1.	2.	4.	1.	1.	0.	2.	1.	3.	2.	4	2.	11
				823	322	426	529	381	811	213	529	708	510	.40	20	2 445
			2.5	2.	2.	4.	1.	1.	0.	2.	1.	4.	2.	5	2.	11
				032	589	865	708	371	812	433	708	061	718	.00	50	1 415

			2.75	2.200	2.803	5.217	1.867	1.364	0.816	2.609	1.867	4.327	2.871	5 .50	2.750	11 0 557
			3.0	2.361	3.008	5.562	2.039	1.360	0.823	2.781	2.039	4.567	3.005	6 .00	3.00	10 9 699
40	25	*±0.50*	1.5	1.415	1.802	3.844	1.861	1.461	1.016	1.922	1.489	4.063	2.464	3 .00	1.50	12 4 849
			1.7	1.586	2.020	4.257	2.061	1.452	1.010	2.128	1.649	4.520	2.719	3 .40	1.70	12 4 162
			1.8	1.670	2.127	4.456	2.158	1.447	1.007	2.228	1.727	4.741	2.840	3 .60	1.80	12 3 819
			2.0	1.835	2.337	4.842	2.349	1.439	1.003	2.421	1.879	5.169	3.072	4 .00	2.00	12 3 132
			2.2	1.995	2.542	5.213	2.536	1.432	0.999	2.606	2.029	5.576	3.289	4 .40	2.20	12 2 445

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
40	25	*±0.50*	2.5	2.22	2.839	5.745	2.814	1.423	0.996	2.873	2.251	6.150	3.587	5.00	2.50	121 415
			2.75	2.41	3.078	6.173	3.048	1.416	0.995	3.086	2.439	6.593	3.811	5.50	2.75	120 557
			3.0	2.59	3.308	6.591	3.291	1.411	0.997	3.295	2.633	7.005	4.015	6.00	3.00	119 699
40	30	*±0.50*	1.5	1.53	1.952	4.400	2.828	1.501	1.204	2.200	1.885	5.522	3.018	3.00	1.50	134 849
			1.7	1.71	2.190	4.881	3.136	1.493	1.197	2.440	2.091	6.159	3.340	3.40	1.70	134 162

			1.8	1.81	2	5.	3	1	1	2	2	6.4	3.4	3.	1.	1
				1	.307	113	.286	.489	.193	.557	.190	69	94	60	80	33 819
			2.0	1.99	2	5.	3	1	1	2	2	7.0	3.7	4.	2.	1
				2	.537	565	.577	.481	.187	.782	.385	70	90	00	00	33 132
			2.2	2.16	2	6.	3	1	1	3	2	7.6	4.0	4.	2.	1
				8	.762	000	.861	.474	.182	.000	.574	48	70	40	20	32 445
			2.5	2.42	3	6.	4	1	1	3	2	8.4	4.4	5.	2.	1
				5	.089	626	.275	.465	.176	.313	.850	71	59	00	50	31 415
			2.75	2.63	3	7.	4	1	1	3	3	9.1	4.7	5.	2.	1
				2	.353	128	.615	.458	.173	.564	.077	15	57	50	75	30 557
			3.0	2.83	3	7.	4	1	1	3	3	9.7	5.0	6.	3.	1
				2	.608	620	.956	.453	.172	.810	.304	22	31	00	00	29 699
50	25	*±0.50*	1.5	1.65	2	6.	2	1	1	2	1	5.5	3.1	3.	1.	1
				0	.102	676	.276	.782	.040	.670	.821	35	27	00	50	44 849
			1.7	1.85	2	7.	2	1	1	2	2	6.1	3.4	3.	1.	1
				3	.360	410	.523	.772	.034	.964	.019	65	57	40	70	44 162
			1.8	1.95	2	7.	2	1	1	3	2	6.4	3.6	3.	1.	1

		2	.487	765	.644	.767	.031	.106	.115	71	16	60	80	43819
	2.0	2.14	2	8.	2	1	1	3	2	7.0	3.9	4.	2.	1
		9	.737	454	.879	.757	.026	.381	.303	62	19	00	00	43 132
	2.2	2.34	2	9.	3	1	1	3	2	7.6	4.2	4.	2.	1
		1	.982	114	.109	.748	.021	.646	.488	28	04	40	20	42 445
	2.5	2.62	3	1	3	1	1	4	2	8.4	4.6	5.	2.	1
		1	.339	0.057	.449	.736	.016	.023	.759	30	00	00	50	41 415
	2.75	2.84	3	1	3	1	1	4	2	9.0	4.9	5.	2.	1
		8	.628	0.806	.733	.726	.014	.322	.986	53	02	50	75	40 557
	3.0	3.06	3	1	4	1	1	4	3	9.6	5.1	6.	3.	1
		8	.908	1.526	.021	.717	.014	.611	.217	37	79	00	00	39 699

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length	Cross-sectional area	Moment of inertia cm^4 R	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius	Nominal inner arc radius	Surface area per meter

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				kg/m	cm^2									mm	mm	length mm^2/ m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
50	30	*±0.50*	1.5	1.76 8	2 .252	7. 558	3. 438	1 .832	1 .235	3 .023	2 .292	7.6 04	3.8 30	3. 00	1. 50	1 54 849
			1.7	1.98 6	2 .530	8. 402	3. 817	1 .822	1 .228	3 .361	2 .545	8.4 92	4.2 47	3. 40	1. 70	1 54 162
			1.8	2.09 4	2 .667	8. 811	4. 002	1 .818	1 .225	3 .525	2 .668	8.9 24	4.4 48	3. 60	1. 80	1 53 819
			2.0	2.30 6	2 .937	9. 606	4. 363	1 .809	1 .219	3 .843	2 .908	9.7 67	4.8 35	4. 00	2. 00	1 53 132
			2.2	2.51 3	3 .202	1 0.372	4. 712	1 .800	1 .213	4 .149	3 .142	10. 579	5.2 03	4. 40	2. 20	1 52 445
			2.5	2.81 7	3 .589	1 1.469	5. 223	1 .788	1 .206	4 .588	3 .482	11. 742	5.7 19	5. 00	2. 50	1 51415
			2.75	3.06	3	1	5.	1	1	4	3	12.	6.1	5.	2.	1

				4	.903	2.343	639	.778	.202	.937	.760	658	18	50	75	50557
			3.0	3.30 3	4 .208	1 3.185	6. 054	1 .770	1 .199	5 .274	4 .036	13. 528	6.4 89	6. 00	3. 00	1 49 699
			3.5	3.76 4	4 .795	1 4.802	6. 901	1 .757	1 .200	5 .921	4 .601	15. 124	7.1 52	7. 00	3. 50	1 47 982
			3.75	3.98 4	5 .075	1 5.588	7. 345	1 .753	1 .203	6 .235	4 .897	15. 851	7.4 46	7. 50	3. 75	1 47 123
			4.0	4.19 8	5 .348	1 6.370	7. 812	1 .750	1 .209	6 .548	5 .208	16. 530	7.7 14	8. 00	4. 00	1 46265
50	40	*±0.50*	1.5	2.00 3	2 .552	9. 323	6. 625	1 .911	1 .611	3 .729	3 .312	12. 258	5.2 39	3. 00	1. 50	1 74 849
			1.7	2.25 3	2 .870	1 0.386	7. 376	1 .902	1 .603	4 .154	3 .688	13. 728	5.8 30	3. 40	1. 70	1 74 162
			1.8	2.37 6	3 .027	1 0.903	7. 742	1 .898	1 .599	4 .361	3 .871	14. 449	6.1 16	3. 60	1. 80	1 73 819
			2.0	2.62 0	3 .337	1 1.912	8. 456	1 .889	1 .592	4 .765	4 .228	15. 862	6.6 73	4. 00	2. 00	1 73 132

	2.2	2.85	3	1	9.	1	1	5	4	17.	7.2	4.	2.	1
		9	.642	2.887	147	.881	.585	.155	.573	235	06	40	20	72 445
	2.5	3.21	4	1	1	1	1	5	5	19.	7.9	5.	2.	1
		0	.089	4.292	0.146	.870	.575	.717	.073	222	65	00	50	71 415
	2.75	3.49	4	1	1	1	1	6	5	20.	8.5	5.	2.	1
		5	.453	5.416	0.951	.861	.568	.166	.476	810	60	50	75	70 557
	3.0	3.77	4	1	1	1	1	6	5	22.	9.1	6.	3.	1
		4	.808	6.503	1.736	.853	.562	.601	.868	336	23	00	00	69 699

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s

50	40	±0.50	3.5	4.313	5.495	18.593	13.269	1.840	1.554	7.437	6.634	25.203	10.154	7.00	3.50	1	67.982
			3.75	4.573	5.825	19.608	14.030	1.835	1.552	7.843	7.015	26.543	10.623	7.50	3.75	1	67.123
			4.0	4.826	6.148	20.613	14.797	1.831	1.551	8.245	7.399	27.820	11.063	8.00	4.00	1	66.265
55	25	±0.50 A	1.5	1.768	2.252	8.476	2.483	1.940	1.050	3.082	1.986	6.290	3.458	3.00	1.50	1	54.849
			1.7	1.986	2.530	9.418	2.754	1.929	1.043	3.425	2.203	7.008	3.827	3.40	1.70	1	54.162
			2.0	2.306	2.937	10.760	3.144	1.914	1.035	3.913	2.516	8.032	4.342	4.00	2.00	1	53.132

55	40	±0.50	1.5	2.121	2.702	11.697	7.181	2.081	1.630	4.254	3.590	14.092	5.794	3.00	1.50	1 84 849
			1.7	2.386	3.040	13.042	8.000	2.071	1.622	4.742	4.000	15.789	6.453	3.40	1.70	1 84 162
			2.0	2.777	3.537	14.976	9.178	2.058	1.611	5.446	4.589	18.255	7.394	4.00	2.00	1 83 132
55	50	±0.60	1.7	2.653	3.380	15.457	13.361	2.139	1.988	5.621	5.345	22.601	8.207	3.40	1.70	2 04 162
			2.0	3.091	3.937	17.786	15.370	2.125	1.976	6.468	6.148	26.195	9.433	4.00	2.00	2 03 132
60	30	±0.60	2.0	2.620	3.337	15.116	5.148	2.128	1.242	5.039	3.432	12.570	5.881	4.00	2.00	1 73 132

2.2	2.859	3.642	16.344	5.564	2.118	1.236	5.448	3.710	13.625	6.337	4.40	2.20	1 72.445
2.5	3.210	4.089	18.107	6.171	2.104	1.228	6.036	4.114	15.140	6.981	5.00	2.50	1 71.415
2.75	3.495	4.453	19.508	6.664	2.093	1.223	6.503	4.443	16.338	7.481	5.50	2.75	1 70.557
3.0	3.774	4.808	20.855	7.152	2.083	1.220	6.952	4.768	17.479	7.950	6.00	3.00	1 69.699
3.5	4.313	5.495	23.409	8.137	2.064	1.217	7.803	5.425	19.589	8.795	7.00	3.50	1 67.982
3.75	4.573	5.825	24.630	8.646	2.056	1.218	8.210	5.764	20.558	9.173	7.50	3.75	1 67.123

			4.0	4.826	6.148	25.823	9.175	2.049	1.222	8.608	6.117	21.469	9.523	8.00	4.00	1 66 265

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
60	40	±0.60	2.0	2.934	3.737	18.482	9.901	2.224	1.628	6.161	4.950	20.702	8.116	4.00	2.00	19 3 132
			2.2	3.204	4.082	20.021	10.720	2.215	1.621	6.674	5.360	22.514	8.777	4.40	2.20	19 2 445
			2.5	3.	4.	22	11	2.	1.	7.	5.	25	9.	5.	2	19

				602	589	.242	.907	202	611	414	953	.142	722	00	.50	1 415
			2.75	3.	5.	24	12	2.	1.	8.	6.	27	10	5.	2	19
				927	003	.018	.862	191	603	006	431	.250	.467	50	.75	0 557
			3.0	4.	5.	25	13	2.	1.	8.	6.	29	11	6.	3	18
				245	408	.733	.794	181	597	578	897	.284	.175	00	.00	9 699
			3.5	4.	6.	29	15	2.	1.	9.	7.	33	12	7.	3	18
				863	195	.003	.607	164	587	668	804	.127	.483	00	.50	7 982
			3.75	5.	6.	30	16	2.	1.	10	8.	34	13	7.	3	18
				162	575	.571	.503	156	584	.190	251	.935	.085	50	.75	7 123
			4.0	5.	6.	32	17	2.	1.	10	8.	36	13	8.	4	18
				454	948	.105	.400	150	582	.702	700	.669	.653	00	.00	6 265
70	50	*±0.60*	2.0	3.	4.	31	18	2.	2.	9.	7.	37	12	4.	2	23
				562	537	.545	.828	637	037	013	531	.454	.196	00	.00	3 132
			2.2	3.	4.	34	20	2.	2.	9.	8.	40	13	4.	2	23
				895	962	.255	.432	627	029	787	173	.825	.231	40	.20	2 445
			2.5	4.	5.	38	22	2.	2.	10	9.	45	14	5.	2	23
				387	589	.185	.761	614	018	.910	104	.754	.724	00	.50	1 415

2.75	4.791	6.103	41.344	24.636	2.603	2.009	11.813	9.854	49.743	15.915	5.50	2.75	23 0 557
3.0	5.187	6.608	44.405	26.457	2.592	2.001	12.687	10.583	53.624	17.060	6.00	3.00	22 9 699
3.5	5.962	7.595	50.256	29.966	2.572	1.986	14.359	11.986	61.064	19.212	7.00	3.50	22 7 982
3.75	6.339	8.075	53.060	31.667	2.563	1.980	15.160	12.667	64.621	20.222	7.50	3.75	22 7 123
4.0	6.710	8.548	55.795	33.341	2.555	1.975	15.941	13.336	68.070	21.189	8.00	4.00	22 6 265
4.5	7.433	9.469	61.085	36.643	2.540	1.967	17.453	14.657	74.640	22.997	9.00	4.50	22 4 548
4.75	7.784	9.916	63.658	38.287	2.534	1.965	18.188	15.315	77.76	23.840	9.50	4.75	22 3690
5.0	8.130	10.356	66.196	39.938	2.528	1.964	18.913	15.975	80.772	24.642	10.00	5.00	22 2831

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
80	40	± 0.70	2.0	3.562	4.537	37.427	12.792	2.872	1.679	9.357	6.396	30.881	11.004	4.00	2.00	23 3132
			2.2	3.895	4.962	40.632	13.867	2.862	1.672	10.158	6.934	33.611	11.921	4.40	2.20	23 2 445
			2.5	4.387	5.589	45.276	15.428	2.846	1.661	11.319	7.714	37.584	13.238	5.00	2.50	23 1 415
			2.75	4.791	6.103	49.003	16.685	2.834	1.653	12.251	8.343	40.782	14.284	5.50	2.75	23 0 557
			3.0	5.187	6.608	52.605	17.910	2.821	1.646	13.151	8.955	43.879	15.283	6.00	3.00	22 9 699

			3.5	5.962	7.595	59.464	20.285	2.798	1.634	14.866	10.142	49.765	17.150	7.00	3.50	22 7 982
			3.75	6.339	8.075	62.736	21.448	2.787	1.630	15.684	10.724	52.556	18.018	7.50	3.75	22 7 123
			4.0	6.710	8.548	65.912	22.605	2.777	1.626	16.478	11.303	55.244	18.844	8.00	4.00	22 6 265
			4.5	7.433	9.469	72.015	24.930	2.758	1.623	18.004	12.465	60.313	20.373	9.00	4.50	22 4 548
			4.75	7.784	9.916	74.958	26.115	2.749	1.623	18.740	13.058	62.695	21.078	9.50	4.75	22 3 690
			5.0	8.130	10.356	77.842	27.326	2.742	1.624	19.461	13.663	64.974	21.744	10.00	5.00	22 2 831
80	50	*±0.70*	2.5	4.780	6.089	52.787	25.583	2.944	2.050	13.197	10.233	55.402	16.979	5.00	2.50	25 1 415
			2.75	5.222	6.653	57.212	27.709	2.933	2.041	14.303	11.084	60.263	18.370	5.50	2.75	25 0 557
			3.0	5.	7.	61	29	2.	2.	15	11	65	19	6.	3.	24

	658	208	.503	.775	921	032	.376	.910	.000	.710	00	00	9 699
3.5	6.	8.	69	33	2.	2.	17	13	74	22	7.	3.	24
	511	295	.713	.757	899	017	.428	.503	.101	.239	00	50	7 982
3.75	6.	8.	73	35	2.	2.	18	14	78	23	7.	3.	24
	928	825	.646	.686	889	011	.411	.274	.465	.430	50	750	7 123
4.0	7.	9.	77	37	2.	2.	19	15	82	24	8.	4.	24
	338	348	.475	.584	879	005	.369	.033	.703	.574	00	00	6 265
4.5	8.	10	84	41	2.	1.	21	16	90	26	9.	4.	24
	139	.369	.856	.316	861	996	.214	.526	.803	.723	00	50	4 548
4.75	8.	10	88	43	2.	1.	22	17	94	27	9.	4.	24
	530	.866	.425	.167	853	993	.106	.267	.664	.730	50	75	3 690
5.0	8.	11	91	45	2.	1.	22	18	98	28	1	5.	24
	915	.356	.926	.021	845	991	.981	.009	.400	.693	0.00	00	2 831

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length	Dimensional	Wall thick	Theoretical	Sectional area	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional	Torsional	Nominal	Nominal	Surface area per

mm		tolerance mm	ness mm	weight per unit length kg/m	cm^2							constant cm^4	modulus cm^3	outer radius mm	inner radius mm	meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
80	60	± 0.70	3.0	6.129	7.808	70.401	45.245	3.003	2.407	17.600	15.082	88.346	24.143	6.00	3.00	26 9 699
			3.5	7.061	8.995	79.961	51.377	2.982	2.390	19.990	17.126	10 1.030	27.340	7.00	3.50	26 7 982
			3.75	7.517	9.575	84.556	54.337	2.972	2.382	21.139	18.112	10 7.151	28.857	7.50	3.75	26 7 123
			4.0	7.966	10.148	89.038	57.236	2.962	2.375	22.259	19.079	11 3.125	30.322	8.00	4.00	26 6 265
			4.5	8.846	11.269	97.696	62.886	2.944	2.362	24.424	20.962	12 4.627	33.097	9.00	4.50	26 4 548
			4.75	9.	11	10	65	2	2	25	21	13	34	9	4	26

				276	.816	1.891	.653	.936	.357	.473	.884	0.155	.410	.50	.75	3 690
			5.0	9.	12	10	68	2	2	26	22	13	35	1	5	26
				700	.356	6.009	.395	.929	.353	.502	.798	5.534	.673	0.00	.00	2 831
90	40	±0.75	3.0	5.	7.	70.	19	3	1	15	9.	51.	17	6	3	24
				658	208	847	.968	.135	.664	.744	984	409	.339	.00	.00	9 699
			4.0	7.	9.	89.	25	3	1	19	12	64.	21	8	4	24
				338	348	027	.208	.086	.642	.784	.604	819	.441	.00	.00	6 265
			5.0	8.	11	10	30	3	1	23	15	76.	24	1	5	24
				915	.356	5.250	.409	.044	.636	.389	.205	374	.819	0.00	.00	2831
90	50	±0.75	2.0	4.	5.	57.	23	3	2	12	9.	53.	15	4	2	27
				190	337	948	.438	.295	.096	.877	375	366	.882	.00	.00	3 132
			2.5	5.	6.	70.	28	3	2	15	11	65.	19	5	2	27
				172	589	433	.406	.269	.076	.652	.363	299	.235	.00	.50	1 415
			3.0	6.	7.	82.	33	3	2	18	13	76.	22	6	3	26
				129	808	205	.093	.245	.059	.268	.237	668	.361	.00	.00	9 699
			4.0	7.	10	10	41	3	2	23	16	97.	27	8	4	26
				966	.148	3.830	.826	.199	.030	.073	.730	704	.961	.00	.00	6 265

			5.0	9.700	12.356	12 3.333	50 .105	3 .159	2 .014	27 .407	20 .042	11 6.466	32 .747	1 0.00	5 .00	26 2 831
90	55	±0.75	2.0	4.347	5.537	61.820	29 .027	3 .341	2 .290	13 .738	10 .555	62.724	17 .601	4 .00	2 .00	28 3 132
			2.5	5.369	6.839	75.220	35 .235	3 .316	2 .270	16 .716	12 .813	76.877	21 .357	5 .00	2 .50	28 1 415
90	60	±0.75	3.0	6.600	8.408	93.563	50 .123	3 .336	2 .442	20 .792	16 .708	10 4.805	27 .391	6 .00	3 .00	28 9 699
			3.5	7.610	9.695	10 6.418	56 .971	3 .313	2 .424	23 .648	18 .990	11 9.955	31 .062	7 .00	3 .50	28 7 982

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer radius mm	Nominal inner radius mm	Surface area per meter

				kg/m												mm²/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
90	60	±0.75	3.75	8.105	10.325	12.601	0.278	.302	.416	5.022	0.093	7.280	.810	7.50	3.75	2 87 123
			4.0	8.594	10.948	18.632	3.519	.292	.409	6.363	1.173	4.437	.501	8.00	4.00	2 86 265
			4.5	9.552	12.169	30.274	9.831	.272	.396	8.950	3.277	8.248	.715	9.00	4.50	2 84 548
			4.75	10.022	12.766	35.903	2.921	.263	.390	0.201	4.307	4.902	.240	9.50	4.75	2 83 690
			5.0	10.485	13.356	41.417	5.978	.254	.385	1.426	5.326	1.387	.712	10.00	5.00	2 82 831
90	50	±0.75	2.0	4.347	5.537	6.154	4.591	.457	.107	3.927	.836	.458	.804	4.00	2.00	2 83 132
			2.5	5.369	6.839	0.476	9.818	.43	.088	6.942	1.927	.324	.364	5.00	2.50	2 81 415

100	40	±0.80	2.5	5.172	6.589	7.489.948	1	3.473	1.696	1	9.898	50.474	16.524	5.756	2.00	2 71 415
			3.0	6.129	7.808	9 2.693	2 2.026	3.445	1.680	1 8.539	1 1.013	59.048	19.395	6.00	3.00	2 69 699
			4.0	7.966	10.148	1 16.815	2 7.810	3.393	1.655	2 3.363	1 3.905	74.527	24.040	8.00	4.00	2 66 265
			5.0	9.700	12.356	1 38.336	3 3.493	3.346	1.646	2 7.667	1 6.746	87.924	27.896	10.00	5.00	2 62 831
100	50	*±0.80*	2.5	5.565	7.089	9 1.374	3 1.229	3.590	2.099	1 8.275	1 2.492	75.393	21.492	5.00	2.50	2 91 415
			2.75	6.086	7.753	9 9.200	3 3.855	3.577	2.090	1 9.840	1 3.542	82.058	23.282	5.50	2.75	2 90 557
			3.0	6.600	8.408	1 06.811	3 6.411	3.564	2.081	2 1.362	1 4.565	88.564	25.012	6.00	3.00	2 89 699
			3.5	7.610	9.695	1 21.418	4 1.339	3.539	2.065	2 4.284	1 6.536	10 1.098	28.295	7.00	3.50	2 87 982
			3.75	8.1	10	1	4	3	2	2	1	10	29	7.	3.	2

		05	.325	28.43	3.725	.527	.058	5.686	7.490	7.126	.850	50	75	87 123
	4.0	8.5	10	1	4	3	2	2	1	11	31	8.	4.	2
		94	.948	35.258	6.069	.515	.051	7.052	8.428	2.994	.350	00	00	86 265
	4.5	9.5	12	1	5	3	2	2	2	12	34	9.	4.	2
		52	.169	48.400	0.662	.492	.040	9.680	0.265	4.252	.183	00	50	84 548
	4.75	10.	12	1	5	3	2	3	2	12	35	9.	4.	2
		022	.766	54.732	2.929	.481	.036	0.946	1.172	9.642	.520	50	75	83 690

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m

H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
100	50	*±0.80*	5.0	10.485	13.356	16.919	55.188	3.471	2.033	32.184	22.075	13.872	36.804	1.00	5.00	2.82831
			5.5	11.391	14.511	17.897	59.721	3.452	2.029	34.579	23.888	14.853	39.219	1.00	5.50	2.81114
			5.75	11.835	15.076	17.711	62.016	3.443	2.028	35.742	24.806	14.605	40.351	1.50	5.75	2.80256
100	60	*±0.80*	2.5	5.957	7.589	10.260	47.055	3.689	2.490	20.652	15.685	10.250	26.234	5.00	2.50	3.11415
			2.75	6.518	8.303	11.208	51.079	3.676	2.480	22.442	17.026	11.554	28.470	5.50	2.75	3.10557
			3.0	7.071	9.008	12.929	55.001	3.664	2.471	24.186	18.334	12.671	30.639	6.00	3.00	3.09

													699
3.5	8.160	10.395	13 7.722	62.564	3.640	2.453	27.544	20.855	13 9.345	34.786	7.00	3.50	3 07 982
3.75	8.694	11.075	14 5.809	66.220	3.628	2.445	29.162	22.073	14 7.901	36.765	7.50	3.75	3 07 123
4	9.222	11.748	15 3.701	69.801	3.617	2.438	30.740	23.267	15 6.269	38.682	8.00	4.00	3 06 265
4.5	10.259	13.069	16 8.936	76.777	3.595	2.424	33.787	25.592	17 2.443	42.336	9.00	4.50	3 04 548
4.75	10.767	13.716	17 6.298	80.188	3.585	2.418	35.260	26.729	18 0.248	44.074	9.50	4.75	3 03 690
5.0	11.270	14.356	18 3.502	83.561	3.575	2.413	36.700	27.854	18 7.864	45.755	1 0.00	5.00	3 02

																		831
100	80	±0.80	2.5	6.742	8.589	12	7.031	90.339	3.846	3.243	25	.406	22	.585	16	5.839	35	.728	5.00	2	.50	3	51	415
			2.75	7.381	9.403	13	8.223	98.256	3.834	3.233	27	.645	24	.564	18	1.103	38	.856	5.50	2	.75	3	50	557
			3.0	8.013	10	.208	14	9.165	10	5.993	3.823	3.222	29	.833	26	.498	19	6.124	41	.909	6.00	3	.00	3	49	699
			3.5	9.259	11	.795	17	0.329	12	0.956	3.800	3.202	34	.066	30	.239	22	5.441	47	.790	7.00	3	.50	3	47	982
			3.75	9.872	12	.575	18	0.567	12	8.197	3.789	3.193	36	.113	32	.049	23	9.735	50	.621	7.50	3	.75	3	47	123
			4.0	10	13	.478	19	0.586	13	5.288	3.779	3.184	38	.117	33	.822	25	3.786	53	.381	8.00	4	.00	3	46	

																			265
			4.5	11 .672	14 .869	21 0.007	14 9.059	3. 758	3. 166	42 .001	37 .265	28 1.156	58 .687	9. 00	4 .50	3 44 548			

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
100	80	± 0.80	4.75	12 .259	15 .616	21 9.428	15 5.757	3 .748	3 .158	43 .886	38 .939	29 4.473	61 .237	9 .50	4 .75	34 3 690
			5.0	12 .840	16 .356	22 8.669	16 2.342	3 .739	3 .150	45 .734	40 .586	30 7.546	63 .719	1 0.00	5 .00	34 2 831

120	50	±0.90	2.5	6.350	8.089	14 4.140	36.875	4 .221	2 .135	24 .023	14 .750	96. 026	26 .006	5 .00	2 .50	33 1 415
			3.0	7.542	9.608	16 8.936	43.047	4 .193	2 .117	28 .156	17 .219	11 2.872	30 .317	6 .00	3 .00	32 9 699
120	60	±0.90	2.5	6.742	8.589	16 1.400	55.326	4 .335	2 .538	26 .900	18 .442	13 2.568	31 .745	5 .00	2 .50	35 1 415
			2.75	7.381	9.403	17 5.600	60.099	4 .322	2 .528	29 .267	20 .033	14 4.567	34 .479	5 .50	2 .75	35 0 557
			3.0	8.013	10 .208	18 9.474	64.757	4 .308	2 .519	31 .579	21 .586	15 6.336	37 .138	6 .00	3 .00	34 9 699
			3.5	9.259	11 .795	21 6.271	73.751	4 .282	2 .501	36 .045	24 .584	17 9.186	42 .236	7 .00	3 .50	34 7 982
			3.75	9.872	12 .575	22 9.212	78.102	4 .269	2 .492	38 .202	26 .034	19 0.268	44 .677	7 .50	3 .75	34 7 123
			4.0	10 .478	13 .348	24 1.860	82.367	4 .257	2 .484	40 .310	27 .456	20 1.120	47 .048	8 .00	4 .00	34 6 265
			4.5	11	14	26	90.	4	2	44	30	22	51	9	4	34

				.672	.869	6.312	669	.232	.469	.385	.223	2.136	.582	.00	.50	4 548
			4.75	12	15	27	94.	4	2	46	31	23	53	9	4	34
				.259	.616	8.137	724	.220	.463	.356	.575	2.299	.747	.50	.75	3690
			5.0	12	16	28	98.	4	2	48	32	24	55	1	5	34
				.840	.356	9.708	728	.209	.457	.285	.909	2.233	.846	0.00	.00	2831
			5.5	13	17	31	10	4	2	52	35	26	59	1	5	34
				.982	.811	2.134	6.623	.186	.447	.022	.541	1.411	.849	1.00	.50	1 114
			5.75	14	18	32	11	4	2	53	36	27	61	1	5	34
				.543	.526	3.012	0.535	.176	.443	.835	.845	0.656	.754	1.50	.75	0 256
			6.0	15	19	33	11	4	2	55	38	27	63	1	6	33
				.098	.233	3.682	4.438	.165	.439	.614	.146	9.671	.597	2.00	.00	9 398
120	80	*±0.90*	2.5	7.	9.	19	10	4	3	32	26	21	43	5	2	39
				527	589	5.921	5.360	.520	.315	.654	.340	5.821	.234	.00	.50	1 415
			2.75	8.	10	21	11	4	3	35	28	23	47	5	2	39
				245	.503	3.413	4.674	.508	.304	.569	.668	5.793	.059	.50	.75	0 557
			3.0	8.	11	23	12	4	3	38	30	25	50	6	3	38
				955	.408	0.55	3.789	.495	.294	.425	.947	5.471	.799	.00	.00	9 699

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Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
120	80	± 0.90	3.5	10.358	13.195	26 3.788	14 1.453	4 .471	3 .274	43 .965	35 .363	29 3.944	58.027	7 .00	3 .50	38 7 982
			3.75	11.049	14.075	27 9.907	15 0.017	4 .459	3 .265	46 .651	37 .504	31 2.738	61.518	7 .50	3 .75	38 7 123
			4.0	11.734	14.948	29 5.705	15 8.414	4 .448	3 .255	49 .284	39 .603	33 1.236	64.927	8 .00	4 .00	38 6 265
			4.5	13.085	16.669	32 6.374	17 4.741	4 .425	3 .238	54 .396	43 .685	36 7.345	71.505	9 .00	4 .50	38 4 548

			4.75	13.750	17.516	34 1.265	18 2.690	4 .414	3 .229	56 .877	45 .672	38 4.954	74. 677	9 .50	4 .75	38 3 690
			5.0	14 .410	18 .356	35 5.875	19 0.509	4 .403	3 .222	59 .312	47 .627	40 2.267	77. 772	1 0.00	5 .00	38 2 831
			5.5	15 .709	20 .011	38 4.296	20 5.800	4 .382	3 .207	64 .049	51 .450	43 5.999	83. 734	1 1.00	5 .50	38 1 114
			5.75	16 .348	20 .826	39 8.130	21 3.294	4 .372	3 .200	66 .355	53 .323	45 2.418	86. 603	1 1.50	5 .75	38 0 256
			6.0	16 .982	21 .633	41 1.730	22 0.701	4 .363	3 .194	68 .622	55 .175	46 8.538	89. 399	1 2.00	6 .00	37 9398
140	80	*±1.00*	3.5	11 .457	14 .595	38 3.637	16 1.950	5 .127	3 .331	54 .805	40 .487	36 5.034	68. 268	7 .00	3 .50	42 7 982
			3.75	12 .227	15 .575	40 7.399	17 1.837	5 .114	3 .322	58 .200	42 .959	38 8.490	72. 418	7 .50	3 .75	42 7 123
			4.0	12 .990	16 .548	43 0.720	18 1.539	5 .102	3 .312	61 .531	45 .385	41 1.597	76. 478	8 .00	4 .00	42 6 265
			4.5	14	18	47	20	5	3	68	50	45	84.	9	4	42

				.498	.469	6.077	0.422	.077	.294	.011	.106	6.757	33	.00	.50	4 548
			4.75	15	19	49	20	5	3	71	52	47	88.	9	4	42
				.242	.416	8.135	9.623	.065	.286	.162	.406	8.811	125	.50	.75	3 690
			5.0	15	20	51	21	5	3	74	54	50	91.	1	5	42
				.980	.356	9.793	8.676	.053	.278	.256	.669	0.513	834	0.00	.00	2 831
			5.5	17	22	56	23	5	3	80	59	54	98.	1	5	42
				.436	.211	1.959	6.382	.030	.262	.280	.095	2.863	998	1.00	.50	1 114
			5.75	18	23	58	24	5	3	83	61	56	10	1	5	42
				.154	.126	2.490	5.057	.019	.255	.213	.264	3.510	2.454	1.50	.75	0256
			6.0	18	24	60	25	5	3	86	63	58	10	1	6	41
				.866	.033	2.671	3.629	.008	.249	.096	.407	3.805	5.829	2.00	.00	9 398
150	50	*±1.10*	4.0	11	14	38	67.	5	2	51	26	19	48.	8	4	38
				.734	.948	2.510	282	.059	.122	.001	.913	2.141	303	.00	.00	6 265

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

33

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
150	50	*±1.10*	5.0	14.410	18.356	459.019	80.605	5.001	2.096	61.203	32.242	23.0051	57.108	10.00	5.00	3 82831
			6.0	16.982	21.633	529.134	93.563	4.946	2.080	70.551	37.425	26.3988	64.765	12.00	6.00	3 79398
			8.0	22.385	28.517	645.028	114.607	4.866	2.272	86.004	56.243	31.5882	75.684	20.00	12.00	3 65 663
150	100	*±1.20*	3.5	13.105	16.695	529.464	284.454	5.632	4.128	70.595	56.891	58.5333	93.387	7.00	3.50	4 87 982
			3.75	13.993	17.825	562.865	302.219	5.619	4.118	75.049	60.444	62.3709	99.218	7.50	3.75	4 87 123

4.0	1	1	59	31	5	4	79	63	66	10	8.	4.	4
	4.874	8.948	5.723	9.685	.607	.108	.430	.937	1.626	4.943	00	00	86 265
4.5	1	2	65	35	5	4	87	70	73	11	9.	4.	4
	6.617	1.169	9.852	3.757	.583	.088	.980	.751	6.076	6.081	00	50	84 548
4.75	1	2	69	37	5	4	92	74	77	12	9.	4.	4
	7.479	2.266	1.143	0.384	.571	.079	.152	.077	2.610	1.496	50	75	83 690
5.0	1	2	72	38	5	4	96	77	80	12	10	5.	4
	8.335	3.356	1.936	6.752	.560	.069	.258	.350	8.682	6.810	.00	00	82 831
5.5	2	2	78	41	5	4	10	83	87	13	11	5.	4
	0.026	5.511	2.070	8.756	.537	.052	4.276	.751	9.438	7.139	.00	50	81 114
5.75	2	2	81	43	5	4	10	86	91	14	11	5.	4
	0.862	6.576	1.437	4.416	.526	.043	8.192	.883	4.121	2.155	.50	75	80 256
6.0	2	2	84	44	5	4	11	89	94	14	12	6.	4
	1.692	7.633	0.354	9.863	.515	.035	2.047	.973	8.341	7.075	.00	00	79398
7.5	2	3	99	54	5	4	13	10	11	17	18	11	4
	6.155	3.319	5.337	4.189	.466	.041	2.712	8.838	45.415	3.620	.75	.25	67809
7.75	2	3	10	56	5	4	13	11	11	17	19	11	4

				6.914	4.285	22.106	0.162	.460	.042	6.281	2.032	75.920	7.783	.38	.63	66736
			8.0	2	3	10	57	5	4	13	11	12	18	20	12	4
				7.665	5.242	48.734	6.258	.455	.044	9.831	5.252	05.888	1.849	.00	.00	65 663
160	60	±	3.0	9.	1	39	84	5	2	48	28	22	50.	6.	3.	4
		1.20		897	2.608	0.212	.269	.563	.585	.777	.090	8.155	140	00	0	29 699
			4.5	1	1	55	11	5	2	69	39	32	70.	9.	4.	4
				4.498	8.469	3.876	8.452	.476	.533	.234	.484	4.955	085	00	50	24 548
160	80	+	3.5	1	1	53	18	5	3	66	45	43	78.	7.	3.	4
		1.20		2.556	5.995	2.675	2.447	.771	.377	.584	.612	8.032	510	00	50	67 982
			3.75	1	1	56	19	5	3	70	48	46	83.	7.	3.	4
				3.404	7.075	6.041	3.658	.758	.368	.755	.414	6.269	321	50	75	67 123

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length	Dimensional	Wall thick	Theoretical	Sectional	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional	Torsional	Nominal	Nominal	Surface area

mm		tolerance mm	ness mm	weight per unit length kg/m	area cm^2							constant cm^4	modulus cm^3	outer radius mm	inner radius mm	per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
160	80	± 1.20	4.0	1	1	598	204	5	3	74	51	494	88	8	4	46
				4.246	8.148	.830	.664	.744	.358	.854	.166	.098	.031	.00	.00	6 265
			4.5	1	2	662	226	5	3	82	56	548	97	9	4	46
				5.911	0.269	.717	.104	.718	.340	.840	.526	.534	.159	.00	.50	4 548
			4.75	1	2	693	236	5	3	86	59	575	10	9	4	46
				6.733	1.316	.837	.556	.705	.331	.730	.139	.141	1.578	.50	.75	3 690
			5.0	1	2	724	246	5	3	90	61	601	10	1	5	46
				7.550	2.356	.423	.842	.692	.323	.553	.711	.340	5.901	0.00	.00	2 831
			5.5	1	2	784	266	5	3	98	66	652	11	1	5	46
				9.163	4.411	.043	.964	.667	.307	.005	.741	.515	4.268	1.00	.50	1 114
			5.75	1	2	813	276	5	3	10	69	677	11	1	5	46

				9.959	5.426	.102	.821	.655	.300	1.638	.205	.491	8.313	1.50	.75	0 256
			6.0	2	2	841	286	5	3	10	71	702	12	1	6	45
				0.750	6.433	.677	.557	.643	.293	5.210	.639	.058	2.268	2.00	.00	9398
			7.5	2	3	990	352	5	3	12	88	840	14	1	1	44
				4.978	1.819	.139	.938	.578	.330	3.767	.234	.434	3.147	8.75	1.25	7 809
			7.75	2	3	1	364	5	3	12	91	861	14	1	1	44
				5.697	2.735	016.077	.135	.571	.335	7.010	.034	.620	6.389	9.38	1.63	6 736
			8.0	2	3	1	375	5	3	13	93	882	14	2	1	44
				6.409	3.642	041.832	.555	.565	.341	0.229	.889	.333	9.540	0.00	2.00	5 663
180	65	*±1.20*	3.0	1	1	550	112	6	2	61	34	306	61	6	3	47
				1.075	4.108	.705	.130	.248	.819	.189	.502	.749	.849	.00	.00	9 699
			4.5	1	2	785	158	6	2	87	48	438	86	9	4	47
				6.264	0.719	.921	.263	.159	.764	.325	.696	.906	.993	.00	.50	4 548
180	100	±1.30	4.0	1	2	927	375	6	4	10	75	853	12	8	4	54
				6.758	1.348	.162	.013	.590	.191	3.018	.003	.848	7.059	.00	.00	6265
			5.0	2	2	112	454	6	4	12	90	104	15	1	5	54
				0.690	6.356	6.933	.502	.539	.153	5.215	.900	4.788	3.883	0.00	.00	2831

			6.0	2	3	131	529	6	4	14	10	122	17	1	6	53
				4.518	1.233	5.278	.495	.489	.117	6.142	5.899	6.684	8.884	2.00	.00	9398
			8.0	3	4	163	678	6	4	18	13	156	22	2	1	52
				1.433	0.042	9.099	.082	.398	.115	2.122	5.616	5.242	2.491	0.00	2.00	5 663
180	160	±*1.60*	4.0	2	2	1	108	7	6	14	13	1	20	8	4	66
				0.526	6.148	298.938	5.657	.048	.444	4.326	5.707	842.330	9.576	.00	.00	6 265
			5.0	2	3	158	1	7	6	17	16	226	25	1	5	66
				5.400	2.356	6.433	325.257	.002	.400	6.270	5.657	8.564	5.805	0.00	.00	2831
			6.0	3	3	186	155	6	6	20	19	268	29	1	6	65
				0.170	8.433	0.462	3.517	.958	.358	6.718	4.190	0.958	9.720	2.00	.00	9 398

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

1.52

Side length mm	Dimensional tolera	Wall thickness mm	Theoretical weight per	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc	Nominal inner arc	Surface area per meter

		nce mm		unit length kg/m										radius mm	radius mm	length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
180	160	*±1.60*	8.0	3	4	23	19	6	6	26	24	34	37	2	1	64
				8.969	9.642	49.627	66.845	.880	.294	1.070	5.856	76.353	9.701	0.00	2.00	5 663
200	100	*±1.30*	3.5	1	2	1	36	7	4	10	73	87	12	7	3	58
				5.853	0.195	064.674	5.972	.261	.257	6.467	.194	1.102	5.979	.00	.50	7 982
			3.75	1	2	1	38	7	4	11	77	92	13	7	3	58
				6.937	1.575	133.224	9.113	.247	.247	3.322	.823	8.557	3.957	.50	.75	7 123
			4.0	1	2	12	41	7	4	12	82	98	14	8	4	58
				8.014	2.948	00.825	1.898	.234	.237	0.083	.380	5.377	1.806	.00	.00	6 265
			4.5	2	2	13	45	7	4	13	91	10	15	9	4	58
				0.150	5.669	33.231	6.436	.207	.217	3.323	.287	97.108	7.122	.00	.500	4 548
			4.75	2	2	13	47	7	4	13	95	11	16	9	4	58
				1.208	7.016	98.059	8.210	.194	.207	9.806	.642	52.019	4.591	.50	.75	3 690
			5.0	2	2	1	49	7	4	14	99	12	17	1	5	58

				2.260	8.356	461.988	9.669	.180	.198	6.199	.934	06.294	1.936	0.00	.00	2 831
			5.5	2	3	1	54	7	4	15	10	13	18	1	5	58
				4.344	1.011	587.201	1.686	.154	.179	8.720	8.337	12.933	6.258	1.00	.50	1 114
			5.75	2	3	1	56	7	4	16	11	13	19	1	5	58
				5.376	2.326	648.511	2.268	.141	.171	4.851	2.454	65.298	3.238	1.50	.75	0256
			6.0	2	3	17	58	7	4	17	11	1	20	1	6	57
				6.402	3.633	08.977	2.583	.128	.162	0.898	6.517	417.026	0.098	2.00	.00	9398
			7.5	3	4	20	70	7	4	20	14	17	23	1	1	56
				2.043	0.819	23.749	4.970	.041	.156	2.375	0.994	17.655	7.821	8.75	1.25	7809
			7.75	3	4	20	72	7	4	20	14	17	24	1	1	56
				2.998	2.035	77.886	5.432	.031	.154	7.789	5.086	64.545	3.770	9.38	1.63	6 736
			8.0	3	4	21	74	7	4	21	14	18	24	2	1	56
				3.945	3.242	31.448	5.965	.021	.153	3.145	9.193	10.724	9.601	0.00	2.00	5663
			10.0	4	5	2	56	6	3	24	11	2	29	2	1	55
				1.265	2.570	444.400	4.400	.820	.280	4.440	2.880	154.130	2.070	5.00	5.00	7079
200	120	*±1.40*	4.0	1	2	1	61	7	5	13	10	1	17	8	4	62
				9.270	4.548	354.510	8.777	.428	.021	5.451	3.129	345.346	2.493	.00	.00	6265

	5.0	2	3	1	75	7	4	16	12	1	20	1	5	62
		3.830	0.356	652.155	2.875	.377	.980	5.216	5.479	652.003	9.875	0.00	.00	2831
	6.0	2	3	1	88	7	4	19	14	1	24	1	6	61
		8.286	6.033	934.865	0.018	.328	.942	3.486	6.670	946.735	5.116	2.00	.00	9398
	8.0	3	4	24	1	7	4	24	18	25	30	2	1	60
		6.457	6.442	26.531	119.574	.228	.910	2.653	6.596	07.038	8.267	0.00	2.00	5 663
	10.0	4	5	28	1	7	4	28	17	30	36	2	1	59
		4.405	6.570	05.730	045.730	.040	.300	0.570	4.290	07.030	3.090	5.00	5.00	7079

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer radius mm	Nominal inner radius mm	Surface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s

200	150	±1.50	3.5	18.600	3.695	02.567	5.125	.694	.181	0.257	0.683	11.905	3.489	.00	0	7 982
			3.75	19.880	5.325	94.337	3.998	.682	.170	9.434	8.533	827.418	6.097	.50	5	7 123
			4.0	21.154	6.948	85.038	022.150	.669	.159	8.504	6.287	942.025	8.549	.00	0	6 265
			4.5	23.682	0.169	63.285	136.334	.645	.137	6.328	1.511	168.520	2.992	.00	0	4 548
			4.75	24.937	1.766	50.854	92.389	.633	.127	5.085	8.985	80.406	4.986	.50	5	3 690
			5.0	26.185	3.356	937.405	247.769	.621	.116	3.741	6.369	91.384	6.830	0.00	0	2 831
			5.5	28.661	6.511	07.505	356.554	.598	.095	0.751	0.874	10.610	0.070	1.00	0	1 114
			5.75	29.890	8.076	91.082	09.985	.586	.085	9.108	7.998	18.857	1.470	1.50	5	0256
			6.0	3	3	22	14	7	6	22	19	28	31	1	6.0	67

				1.112	9.633	73.697	62.794	.574	.075	7.370	5.039	26.193	2.723	2.00	0	9398
			7.5	3	4	27	17	7	6	27	23	3	37	1	11.	66
				7.930	8.319	18.906	57.525	.501	.031	1.891	4.337	463.854	6.269	8.75	25	7809
			7.75	3	4	27	18	7	6	27	24	35	38	1	11.	66
				9.081	9.785	94.375	06.991	.492	.025	9.438	0.932	64.853	6.429	9.38	63	6 736
			8.0	4	5	28	18	7	6	28	24	3	39	2	12.	66
				0.225	1.242	69.155	56.148	.483	.019	6.915	7.486	664.857	6.444	0.00	00	5 663
			10.0	4	6	3	19	7	5	33	26	4	47	2	15.	65
				9.115	2.570	347.730	95.230	.310	.650	4.770	6.030	428.410	1.450	5.00	00	7 079
			12.0	5	7	36	20	7	5	36	27	5	53	3	24.	63
				6.567	2.060	68.460	83.940	.140	.380	6.850	7.860	099.210	2.080	6.00	00	8 194
220	14	*±1.50*	4.0	2	2	18	94	8	5	17	13	19	22	8	4.0	70
	0			1.782	7.748	93.674	8.757	.261	.847	2.152	5.537	87.666	4.330	.00	0	6 265
			5.0	2	3	23	11	8	5	21	16	2	27	1	5.0	70
				6.970	4.356	16.089	57.960	.211	.806	0.554	5.423	446.818	3.871	0.00	0	2 831
			6.0	3	4	27	1	8	5	24	19	28	32	1	6.0	69
				2.054	0.833	19.637	357.327	.161	.766	7.240	3.904	90.795	0.954	2.00	0	9 398

		8.0	4	5	34	17	8	5	31	24	3	40	2	12.	68
			1.481	2.842	29.727	25.631	.056	.715	1.793	6.519	745.740	6.852	0.00	00	5 663
		10.0	5	6	4	17	7	5	36	24	4	48	2	15.	67
			0.685	4.570	017.120	45.120	.890	.200	5.190	9.300	523.310	3.770	5.00	00	7 079

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

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Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
220	140	*±1.50*	12.0	58.451	74.460	4407.870	1174.960	7.690	4.840	40.720	24.280	5205.520	54.080	3 6.00	2 4.00	65 8 194
250	15	*±1.60*	3.5	2	2	238	1	9	6	19	14	234	24	7	3	78

0		1.348	7.195	4.022	092.956	.363	.340	0.722	5.727	7.793	3.563	.00	.50	7 982
	3.75	2	2	2	116	9	6	20	15	250	25	7	3	78
		2.824	9.075	541.809	4.565	.350	.329	3.345	5.275	6.816	9.563	.50	.75	7 123
	4.0	2	3	2	1	9	6	21	16	2	27	8	4	78
		4.294	0.948	697.989	235.363	.337	.318	5.839	4.715	664.681	5.384	.00	.00	6 265
	4.5	2	3	300	137	9	6	24	18	297	30	9	4	78
		7.215	4.669	5.583	4.575	.311	.297	0.447	3.277	6.930	6.493	.00	.50	4 548
	4.75	2	3	3	1	9	6	25	19	3	32	9	4	78
		8.665	6.516	157.023	443.012	.298	.286	2.562	2.402	131.314	1.784	.50	.75	3 690
	5.0	3	3	330	151	9	6	26	20	328	33	1	5	78
		0.110	8.356	6.910	0.686	.285	.276	4.553	1.425	4.537	6.900	0.00	.00	2 831
	5.5	3	4	360	1	9	6	28	21	3	36	1	5	78
		2.979	2.011	2.086	643.796	.260	.255	8.167	9.173	587.496	6.616	1.00	.50	1 114
	5.75	3	4	3	170	9	6	29	22	3	38	1	5	78
		4.403	3.826	747.404	9.260	.247	.245	9.792	7.901	737.231	1.217	1.50	.75	0256
	6.0	3	4	389	1	9	6	31	23	388	39	1	6	77
		5.822	5.633	1.231	774.014	.234	.235	1.298	6.535	5.803	5.648	2.00	.00	9398

			7.5	4	5	4	213	9	6	37	28	4	47	1	1	76
				3.818	5.819	665.363	8.618	.142	.190	3.229	5.149	770.265	7.776	8.75	1.25	7 809
			7.75	4	5	4	219	9	6	38	29	491	49	1	1	76
				5.165	7.535	796.517	9.433	.131	.183	3.721	3.258	0.979	0.951	9.38	1.63	6 736
			8.0	4	5	4	225	9	6	39	30	5	50	2	1	76
				6.505	9.242	926.399	9.854	.119	.176	4.112	1.314	050.449	3.958	0.00	2.00	5 663
			10.0	5	7	582	229	8	5	46	30	612	60	2	1	75
				6.965	2.570	5.010	5.010	.960	.620	6.000	6.000	0.700	2.080	5.00	5.00	7079
			12.0	6	8	6	231	8	5	51	30	7	68	3	2	73
				5.987	4.060	457.900	0.860	.770	.240	6.630	8.110	088.460	4.430	6.00	4.00	8 194
250	18	*±1.60*	4.0	2	3	3	185	9	7	24	20	359	33	8	4	84
	0			6.178	3.348	061.117	6.602	.581	.461	4.889	6.289	4.190	3.442	.00	.00	6265
			5.0	3	4	3	227	9	7	30	25	4	40	1	5	84
				2.465	1.356	757.160	5.683	.531	.418	0.573	2.854	438.399	8.859	0.00	.00	2831
			6.0	3	4	4	267	9	7	35	29	5	48	1	6	83
				8.648	9.233	427.163	8.238	.483	.376	4.173	7.582	260.771	1.260	2.00	.00	9 398
			8.0	5	6	5	3	9	7	45	37	6	61	2	1	82

				0.273	4.042	629.423	415.419	.376	.303	0.354	9.491	866.361	6.138	0.00	2.00	5 663

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
250	180	±1.60	10.0	61.675	78.570	6689.510	3774.010	9.230	6.930	535.160	419.330	8359.220	739.840	25.00	15.00	817079
			12.0	71.639	91.260	7478.350	4047.060	9.050	6.660	598.270	449.670	9748.230	846.780	36.00	24.00	798 194
250	200	*±1.60*	4.0	27.434	34.948	3303.203	2353.465	9.722	8.206	264.256	235.347	4253.769	372.154	8.00	4.00	886265
			5.0	33	44	4028	2832	9.	8	322	283	5345	451	10	5	88

				4.035	3.356	057.327	88.238	674	.162	4.586	8.824	257.394	6.845	0.00	.00	2831
			6.0	4	5	4	34	9.	8	38	34	6	53	1	6	87
				0.532	1.633	784.451	03.137	626	.119	2.756	0.314	236.972	8.357	2.00	.00	9398
			8.0	5	6	6	4	9.	8	48	43	8	69	2	1	86
				2.785	7.242	098.106	344.568	523	.038	7.848	4.457	155.981	0.975	0.00	2.00	5 663
			10.0	6	8	7	4	9.	7	58	49	9	83	2	1	85
				4.815	2.570	265.840	963.370	380	.750	1.270	6.330	950.030	1.770	5.00	5.00	7079
			12.0	7	9	81	5	9.	7	65	54	11	95	3	2	83
				5.407	6.060	58.660	446.140	220	.530	2.690	4.610	639.550	5.180	6.00	4.00	8 194
260	18	*±1.80*	5.0	3	4	4	23	9.	7	31	26	4	42	1	5	86
	0			3.250	2.356	124.095	52.266	867	.452	7.238	1.363	694.894	5.870	0.00	.00	2831
			6.0	3	5	4	27	9.	7	37	30	5	50	1	6	85
				9.590	0.433	861.539	69.102	818	.410	3.965	7.678	565.693	1.439	2.00	.00	9398
			8.0	5	6	6	3	9.	7	47	39	7	64	2	1	84
				1.529	5.642	185.816	533.840	707	.337	5.832	2.649	266.676	2.426	0.00	2.00	5663
			10.0	6	8	74	4	9.	7	57	47	88	77	2	1	83
				3.245	0.566	62.452	273.272	624	.283	4.035	4.808	50.299	1.936	5.00	5.00	7 079

			12.0	7	9	8	4	9.	6	63	45	10	88	3	2	81
				5.523	3.660	245.010	138.260	380	.650	4.260	9.810	328.330	4.100	6.00	4.00	8194
280	18	*±1.70*	5.0	3	4	4	25	1	7	35	27	5	45	1	5	90
	0			4.820	4.356	922.000	05.433	0.534	.516	1.571	8.381	214.627	9.893	0.00	.00	2831
			6.0	4	5	58	29	1	7	41	32	6	54	1	6	89
				1.474	2.833	06.541	50.830	0.484	.473	4.753	7.870	183.514	1.800	2.00	.00	9398
			8.0	5	6	73	37	1	7	52	41	8	69	2	1	88
				4.041	8.842	97.865	70.683	0.366	.401	8.419	8.965	077.538	5.009	0.00	2.00	5 663
			10.0	6	8	89	4	1	7	63	50	98	83	2	1	87
				6.385	4.566	31.912	562.606	0.277	.345	7.994	6.956	44.891	6.143	5.00	5.00	7079
			12.0	7	9	9	43	1	6	70	47	11	95	3	2	85
				7.291	8.460	920.010	11.370	0.040	.620	8.570	9.040	502.910	9.650	6.00	4.00	8194
280	20	*±1.80*	5.0	3	4	53	3	1	8	37	31	61	51	1	5	94
	0			6.390	6.356	00.167	173.488	0.693	.274	8.583	7.349	96.055	3.871	0.00	.00	2831

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Si	Dim	V	The	C	Moment of	Radius	Elastic	To	To	N	N	S

de length mm		ensional tolerance mm	all thick ness mm	oretical weight per unit length kg/m	ross-section al area cm^2	inertia cm^4		of gyration cm		section modulus cm^3		rsional constan t cm^4	rsional modulu s cm^3	ominal outer arc radius mm	ominal inner arc radius mm	urface area per meter length mm^2/ m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
280	200	± 1.80	6.0	43.358	5.233	6 257.069	3 741.969	1 0.644	8 .231	4 46.933	3 74.197	73 54.002	60 6.083	12 .00	6. 00	9 39398
			8.0	56.553	7 2.042	79 89.907	4 787.192	1 0.531	8 .152	5 70.708	4 78.719	96 25.492	77 9.412	20 .00	12 .00	9 25 663
			10.0	69.525	8 8.566	9 661.246	5 795.535	1 0.444	8 .089	6 90.089	5 79.553	11 756.677	94 0.008	25 .00	15 .00	9 17 079
			12.0	81.	1	10	58	1	7	7	5	13	10	36	24	8

				059	03.260	782.470	38.600	0.220	.520	70.180	83.860	779.110	82.340	.00	.00	98 194
300	100	±1.70	5.0	30.110	3 8.356	4 067.951	72 5.502	1 0.298	4 .349	2 71.197	1 45.100	20 43.796	26 2.229	10 .00	5. 00	7 82 831
			6.0	35.822	4 5.633	47 82.457	84 8.023	1 0.237	4 .311	3 18.830	1 69.605	24 03.461	30 6.208	12 .00	6. 00	7 79398
			8.0	46.505	5 9.242	6 018.468	10 85.378	1 0.079	4 .280	4 01.231	2 17.076	30 80.344	38 5.236	20 .00	12 .00	7 65 663
			10.0	56.965	7 2.566	7 205.172	1 323.550	9 .964	4 .271	4 80.345	2 64.710	3 681.003	45 4.513	25 .00	15 .00	7 57079
			12.0	65.987	8 4.060	78 08.310	11 4.230	9 .640	1 .170	5 20.550	2 2.850	4 177.460	50 8.490	36 .00	24 .00	7 38 194
300	150	±1.70	4.5	30.747	3 9.169	4 681.23	1 612.81	1 0.932	6 .417	3 12.083	2 15.042	38 18.556	37 0.004	9. 00	4. 50	8 84 548

			8	7									
4.75	32.394	4 1.266	49 19.647	1 693.635	1 0.919	6 .406	3 27.976	2 25.818	4 017.118	38 8.593	9. 50	4. 75	8 83 690
5.0	34.035	4 3.356	51 55.867	17 73.602	1 0.905	6 .396	3 43.724	2 36.48	4 214.250	40 6.985	10 .00	5. 000	8 82 831
5.5	37.296	4 7.511	5 621.804	1 931.038	1 0.878	6 .375	3 74.787	2 57.472	4 604.223	44 3.179	11 .00	5. 50	8 81 114
5.75	38.917	4 9.576	58 51.552	20 08.534	1 0.864	6 .365	3 90.103	2 67.805	47 97.063	46 0.984	11 .50	5. 75	8 80 256
6.0	40.532	5 1.633	6 079.177	20 85.234	1 0.851	6 .355	4 05.278	2 78.031	4 988.471	47 8.596	12 .00	6. 00	8 79398
7.5	49.705	6 3.319	73 09.552	25 19.712	1 0.744	6 .308	4 87.303	3 35.962	61 28.310	57 9.322	18 .75	11 .25	8 67809
7.75	51.	6	75	25	1	6	5	3	6	59	19	11	8

			249	5.285	17.848	91.875	0.731	.301	01.190	45.583	310.203	5.516	.38	.63	66736
		8.0	52.785	6 7.242	77 24.175	26 63.561	1 0.718	6 .294	5 14.945	3 55.141	6 490.587	61 1.520	20 .00	12 .00	8 65 663
		9.5	61.851	7 8.791	89 22.906	3 085.633	1 0.642	6 .258	5 94.860	4 11.418	7 540.882	70 3.597	23 .75	14 .25	8 59 225

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s

300	150	±1.70	9.75	6	8	9	3	1	6	60	42	7	71	2	1	85
				3.336	0.683	116.530	154.990	0.630	.253	7.769	0.665	710.541	8.293	4.38	4.63	8152
			10.0	6	8	930	3	1	6	62	42	7	73	2	1	85
				4.815	2.566	8.505	224.169	0.618	.249	0.567	9.889	878.645	2.806	5.00	5.00	7079
			12.0	7	9	102	2	1	5	68	32	9	83	3	2	83
				5.407	6.060	98.070	460.510	0.350	.060	6.540	8.070	153.100	6.910	6.00	4.00	8194
300	160	±1.80	5.0	3	4	537	20	1	6	35	25	4	43	1	5	90
				4.820	4.356	3.451	46.257	1.007	.792	8.230	5.782	707.351	5.958	0.00	.00	2831
			6.0	4	5	633	24	1	6	42	30	5	51	1	6	89
				1.474	2.833	8.521	07.725	0.953	.751	2.568	0.966	576.389	3.111	2.00	.00	9398
			8.0	5	6	8	30	1	6	53	38	7	65	2	1	88
				4.041	8.842	065.316	76.861	0.824	.685	7.688	4.608	267.811	6.863	0.00	2.00	5 663
			10.0	6	8	972	3	1	6	64	46	8	78	2	1	87
				6.385	4.566	9.172	724.143	0.726	.636	8.611	5.518	837.815	8.628	5.00	5.00	7 079
			12.0	7	9	10	3	1	5	71	38	10	90	3	2	85
				7.291	8.460	796.030	078.330	0.470	.590	9.740	4.790	294.000	2.860	6.00	4.00	8194
300	20	±2.00	4.5	3	4	5	3	1	8	37	30	6	50	9	4	98

0		4.280	3.669	663.666	053.446	1.388	.362	7.578	5.345	185.059	0.884	.00	.50	4 548
	4.75	3	4	5	32	1	8	39	32	6	52	9	4	98
		6.123	6.016	954.911	09.238	1.376	.351	6.994	0.924	511.333	6.499	.50	.75	3690
	5.0	3	4	6	33	1	8	41	33	6	55	1	5	98
		7.960	8.356	243.784	63.655	1.363	.340	6.252	6.366	835.776	1.890	0.00	.00	2 831
	5.5	4	5	6	3	1	8	45	36	74	60	1	5	98
		1.614	3.011	814.483	668.419	1.338	.319	4.299	6.842	79.168	2.005	1.00	.50	1 114
	5.75	4	5	7	38	1	8	47	38	7	62	1	5	98
		3.431	5.326	096.342	18.796	1.325	.308	3.089	1.88	798.115	6.731	1.50	.75	0256
	6.0	4	5	737	3	1	8	49	39	81	65	1	6	97
		5.242	7.633	5.897	967.857	1.313	.297	1.726	6.786	15.228	1.238	2.00	.00	9398
	7.5	5	7	891	4	1	8	59	48	10	79	1	1	96
		5.593	0.819	4.083	804.374	1.219	.237	4.272	0.437	017.054	2.786	8.75	1.25	7809
	7.75	5	7	9	4	1	8	61	49	10	81	1	1	96
		7.333	3.035	173.056	943.843	1.207	.227	1.537	4.384	322.730	5.691	9.38	1.63	6736
	8.0	5	7	942	5	1	8	62	50	10	83	2	1	96
		9.065	5.242	9.881	082.275	1.195	.219	8.659	8.227	626.501	8.380	0.00	2.00	5 663

		9.5	6	8	10	58	1	8	72	58	12	97	2	1	95
			9.309	8.291	927.888	93.151	1.125	.170	8.526	9.315	408.675	0.006	3.75	4.25	9 225
		9.75	7	9	11	6	1	8	74	60	12	99	2	1	95
			0.990	0.433	170.776	025.373	1.114	.163	4.718	2.537	698.889	1.201	4.38	4.63	8 152

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
300	200	±2.00	10.0	72.665	92.566	11411.839	6156.868	1.103	8.156	76 0.789	61 5.687	12 987.134	10 12.186	2 5.00	1 5.00	95 7079
			12.0	84.828	108.060	127 87.830	6 084.790	1 0.880	7. 500	85 2.520	60 8.480	15 235.560	11 67.140	3 6.00	2 4.00	93 8 194

300	250	±2.20	5.0	4	53	733	5	1	1	48	44	9	69	1	5	10
				1.885	.356	1.701	558.160	1.722	0.206	8.780	4.653	781.565	6.856	0.00	.00	82831
			6.0	4	63	867	6	1	1	57	52	11	82	1	6	1
				9.952	.633	2.617	570.891	1.674	0.162	8.174	5.671	630.487	3.982	2.00	.00	079 398
			8.0	6	83	11	8	1	1	74	67	152	1	2	1	10
				5.345	.242	135.588	441.519	1.576	0.070	2.373	5.322	78.866	065.467	0.00	2.00	65663
			10.0	8	10	13	10	1	9.	90	81	18	1	2	1	1
				0.515	2.566	515.172	246.647	1.479	995	1.011	9.732	740.054	291.995	5.00	5.00	057 079
			12.0	9	12	15	11	1	9.	1	89	22	14	3	2	1
				4.247	0.060	277.590	137.070	1.280	630	018.51 0	0.970	092.950	98.070	6.00	4.00	038 194
350	150	±2.20	5.0	3	48	7	20	1	6.	43	27	5	47	1	5	98
				7.960	.356	546.777	36.519	2.493	490	1.244	1.536	169.184	7.077	0.00	.00	2 831
			6.0	4	57	891	23	1	6.	50	31	6	56	1	6	97
				5.242	.633	2.534	96.454	2.436	448	9.288	9.527	120.751	1.556	2.00	.00	9 398

			8.0	5	75	11	30	1	6.	64	40	7	71	2	1	96
				9.065	.242	362.481	67.268	2.289	385	9.285	8.969	967.871	9.109	0.00	2.00	5 663
			10.0	7	92	13	37	1	6.	78	49	9	86	2	1	95
				2.665	.566	724.943	15.003	2.177	335	4.282	5.334	680.968	3.576	5.00	5.00	7079
350	180	±2.10	5.0	4	51	843	3	1	7.	48	33	7	57	1	5	1
				0.315	.356	9.527	041.516	2.819	696	2.259	7.946	090.694	8.987	0.00	.00	042
																831
			6.0	4	61	9	3	1	7.	57	39	8	68	1	6	1
				8.068	.233	977.666	586.878	2.765	654	0.152	8.542	413.231	3.084	2.00	.00	039
																398
			8.0	6	80	12	4	1	7.	72	51	11	87	2	1	10
				2.833	.042	766.305	599.632	2.629	581	9.503	1.070	001.509	9.092	0.00	2.00	25663
			10.0	7	98	15	5	1	7.	88	61	13	10	2	1	1
				7.375	.566	459.443	575.272	2.524	521	3.397	9.475	429.981	60.948	5.00	5.00	017
																079
350	200	±2.10	5.0	4	53	9	38	1	8.	51	38	8	64	1	5	1
				1.885	.356	034.694	39.072	3.013	482	6.268	3.907	474.749	6.947	0.00	.00	082
																831

	6.0	4	63	10	4	1	8.	61	45	10	76	1	6	1
		9.952	.633	687.754	532.577	2.960	440	0.729	3.258	065.263	4.137	2.00	.00	079
														398
	8.0	6	83	13	58	1	8.	78	58	13	98	2	1	1
		5.345	.242	702.188	19.981	2.830	362	2.982	1.998	189.340	5.823	0.00	2.00	065
														663
	10.0	8	10	16	7	1	8.	94	70	16	11	2	1	1
		0.515	2.566	615.777	060.202	2.728	297	9.473	6.020	136.603	92.674	5.00	5.00	057
														079

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Nominal outer radius mm	Nominal inner radius mm	Surface area per meter mm^2/m

H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
350	220	*±2.20*	5.0	43.455	55.356	9629.861	4743.339	1.189	9.257	55.278	43.213	9930.819	71.917	1.00	5.00	1122831
			6.0	51.836	66.033	113597.842	5605.541	1.138	9.214	65.305	50.595	11803.676	84.207	1.00	6.00	119398
			8.0	67.857	86.442	14638.071	7206.815	1.013	9.131	83.461	65.165	15492.352	10.596	2.00	1.00	1105663
			10.0	83.655	10.566	17772.110	87.264	1.914	9.062	1.549	79.479	18.263	1.324.478	2.00	1.00	1097079
350	250	*±2.20*	4.5	41.345	52.669	9532.481	5718.048	1.453	1.420	54.713	45.444	11057.885	74.281	9.00	4.50	1184548
			4.75	43.580	55.516	10029.223	6014.389	1.441	1.408	57.098	48.151	11647.142	77.722	9.50	4.75	1183690
			5.0	4	58	10	63	1	1	60	50	12	81	1	5	11

	5.810	.356	522.611	08.577	3.428	0.397	1.292	4.686	233.754	6.888	0.00	.00	82831
5.5	5	64	11	68	1	1	65	55	133	89	1	5	11
	0.249	.011	499.393	90.554	3.403	0.375	7.108	1.244	99.035	2.404	1.00	.50	81 114
5.75	5	66	11	71	1	1	68	57	13	92	1	5	11
	2.458	.826	982.824	78.377	3.391	0.364	4.733	4.270	977.703	9.755	1.50	.75	80 256
6.0	5	69	12	74	1	1	71	59	14	96	1	6	11
	4.662	.633	462.974	64.111	3.378	0.353	2.170	7.129	553.720	6.838	2.00	.00	79398
7.5	6	85	15	9	1	1	86	72	18	11	1	1	11
	7.368	.819	144.911	077.238	3.284	0.285	5.423	6.179	018.210	82.808	8.75	1.25	67809
7.75	6	88	15	93	1	1	89	74	185	1	1	1	11
	9.500	.535	595.003	46.161	3.272	0.274	1.143	7.693	78.615	217.943	9.38	1.63	66736
8.0	7	91	16	9	1	1	91	76	19	1	2	1	11
	1.625	.242	041.895	613.226	3.260	0.264	6.680	9.058	136.324	252.811	0.00	2.00	65663
9.5	8	10	186	11	1	1	1	89	22	1	2	1	11
	4.224	7.291	58.245	178.728	3.187	0.207	066.185	4.298	425.396	456.486	3.75	4.25	59225
9.75	8	10	19	11	1	1	10	91	22	1	2	1	11
	6.298	9.933	083.860	433.873	3.176	0.198	90.506	4.710	963.954	489.517	4.38	4.63	58 152

			10.0	8	11	19	11	1	1	11	93	23	1	2	1	11
				8.365	2.566	506.610	687.480	3.164	0.190	14.663	4.998	499.737	522.289	5.00	5.00	57079
350	30	*±2.30*	5.0	4	63	12	9	1	1	68	63	16	98	1	5	12
	0			9.735	.356	010.527	507.534	3.768	2.250	6.316	3.836	338.844	6.865	0.00	.00	82831
			6.0	5	75	14	11	1	1	81	75	194	11	1	6	12
				9.372	.633	238.194	266.057	3.721	2.205	3.611	1.070	56.667	69.600	2.00	.00	79398
			8.0	7	99	183	14	1	1	10	96	25	15	2	1	12
				7.905	.242	81.601	547.001	3.610	2.107	50.377	9.800	633.369	19.936	0.00	2.00	65663

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1 ±Δ	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s

350	300	±2.30	10.0	9	12	223	17	1	1	12	11	31	18	2	1	1
				6.215	2.566	97.443	721.839	3.518	2.025	79.854	81.456	548.248	52.161	5.00	5.00	257 079
360	200	±2.20	5.0	4	54	967	3	1	8	53	39	880	66	1	5	11
				2.670	.356	0.910	934.155	3.339	.507	7.273	3.416	8.343	5.959	0.00	.00	02831
			6.0	5	64	11	4	1	8	63	46	10	78	1	6	1
				0.894	.833	443.175	645.521	3.285	.465	5.732	4.552	462.130	6.718	2.00	.00	099 398
			8.0	6	84	146	5	1	8	81	59	13	10	2	1	1
				6.601	.842	78.313	967.523	3.153	.387	5.462	6.752	710.688	15.315	0.00	2.00	085 663
			10.0	8	10	17	7	1	8	98	72	16	12	2	1	1
				2.085	4.566	806.414	240.868	3.049	.321	9.245	4.087	777.143	28.778	5.00	5.00	077 079
400	160	±2.40	5.0	4	54	10	26	1	6	54	33	688	58	1	5	1
				2.670	.356	932.223	47.090	4.182	.978	6.611	0.886	9.836	6.130	0.00	.00	102 831
			6.0	5	64	12	31	1	6	64	38	8	69	1	6	1

				0.894	.833	932.047	19.565	4.123	.937	6.602	9.946	166.178	1.011	2.00	.00	099 398
			8.0	6 6.601	84 .842	16 556.060	4 001.875	1 3.969	6 .868	82 7.803	50 0.234	10 651.608	88 7.990	2 0.00	1 2.00	1 085 663
			10.0	8 2.085	10 4.566	20 059.128	48 50.809	1 3.850	6 .811	10 02.956	60 6.351	12 972.837	10 70.067	2 5.00	1 5.00	1 077 079
400	200	±2.40	4.5	4 1.345	52 .669	11 317.420	39 13.553	1 4.659	8 .620	56 5.871	39 1.355	9 188.593	67 2.871	9 .00	4 .50	1 184 548
			4.75	4 3.580	55 .516	11 906.996	4 114.828	1 4.645	8 .609	59 5.350	41 1.483	9 674.936	70 7.576	9 .50	4 .75	1 183 690
			5.0	4 5.810	58 .356	12 492.556	43 14.488	1 4.631	8 .598	62 4.628	43 1.449	10 158.737	74 2.010	1 0.00	5 .00	11 82831
			5.5	5 0.249	64 .011	13 651.706	4 709.028	1 4.604	8 .577	68 2.585	47 0.903	11 118.714	81 0.065	1 1.00	5 .50	1 181

114

5.75	5	66	142	4	1	8	71	49	11	84	1	5	11
	2.458	.826	25.334	903.938	4.590	.566	1.267	0.394	594.890	3.689	1.50	.75	80 256
6.0	5	69	14	5	1	8	73	50	12	87	1	6	11
	4.662	.633	795.023	097.297	4.576	.556	9.751	9.730	068.522	7.047	2.00	.00	79398
7.5	6	85	17	6	1	8	89	61	14	10	1	1	11
	7.368	.819	955.034	194.687	4.464	.496	7.752	9.469	906.917	70.706	8.75	1.25	67809
7.75	6	88	184	6	1	8	92	63	153	11	1	1	11
	9.500	.535	87.006	376.821	4.450	.487	4.350	7.682	64.866	02.130	9.38	1.63	66736
8.0	7	91	19	6	1	8	95	65	15	11	2	1	11
	1.625	.242	015.025	557.688	4.436	.478	0.751	5.769	820.216	33.292	0.00	2.00	65663
9.5	8	10	22	7	1	8	11	76	18	1	2	1	11
	4.224	7.291	102.399	618.367	4.353	.427	05.120	1.837	497.286	314.777	3.75	4.25	59225

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length	Dimension	Wall thick	Theoretical	Cross-section	Moment of inertia cm^4	Radius of gyration cm	Elastic section modulus cm^3	Torsional	Torsional	Nominal	Nominal	Surface area

mm		al toler ance mm	ness mm	weight per unit length kg/m	al area cm^2							constant cm^4	modulu s cm^3	outer arc radiu s mm	inner arc radiu s mm	per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
400	200	±2.40	9.75	8	1	22	779	1	8	11	77	18	1	2	1	11
				6.298	09.933	603.903	1.427	4.339	.419	30.195	9.143	934.218	344.120	4.38	4.63	58 152
			10.0	8	1	23	796	1	8	1	79	193	1	2	1	11
				8.365	12.566	101.794	3.535	4.326	.411	155.090	6.353	68.487	373.208	5.00	5.00	57079
			11.5	9	1	25	901	1	8	1	90	21	1	3	2	11
				9.722	27.034	709.101	8.705	4.226	.426	285.455	1.871	958.045	537.620	4.50	3.00	40769
			11.7 5	1	1	26	919	1	8	13	91	22	15	3	2	11
				01.698	29.552	176.632	4.369	4.215	.424	08.832	9.437	371.570	64.618	5.25	3.50	39482
			12.0	1	1	26	937	1	8	1	93	22	1	3	2	1
				03.667	32.059	641.433	0.275	4.203	.423	332.072	7.027	782.095	591.354	6.00	4.00	138 194

400	250	±2.60	5.0	4	6	14	7	1	1	72	56	14	93	1	5	12
				9.735	3.356	442.973	058.993	5.098	0.555	2.149	4.719	772.671	6.928	0.00	.00	82831
			6.0	5	7	17	835	1	1	85	66	17	11	1	6	12
				9.372	5.633	123.743	7.331	5.047	0.512	6.187	8.586	580.027	09.709	2.00	.00	79398
			8.0	7	9	22	10	1	1	1	86	23	1	2	1	12
				7.905	9.242	088.732	784.933	4.919	0.425	104.437	2.795	127.493	440.188	0.00	2.00	65663
			10.0	9	1	26	13	1	1	1	10	28	17	2	1	1
				6.215	22.566	905.128	128.314	4.816	0.349	345.256	50.265	423.193	52.643	5.00	5.00	257
																079
			12.0	1	1	31	153	1	1	1	12	33	20	3	2	1
				13.087	44.059	159.193	54.709	4.707	0.324	557.960	28.377	596.612	41.652	6.00	4.00	238
																194
400	300	±2.50	4.5	4	6	14	9	1	1	74	63	17	1	9	4	1
				8.410	1.669	837.028	593.381	5.511	2.473	1.851	9.559	932.447	024.681	.00	.50	384
																548
			4.75	5	6	15	10	1	1	78	67	18	1	9	4	13
				1.038	5.016	617.460	095.965	5.499	2.461	0.873	3.064	894.501	078.446	.50	.75	83690

5.0	5	6	16	10	1	1	81	70	19	1	1	5	1
	3.660	8.356	393.389	595.451	5.486	2.450	9.669	6.363	852.947	131.888	0.00	.00	382 831
5.5	5	7	17	11	1	1	89	77	21	1	1	5	1
	8.884	5.011	931.816	585.202	5.461	2.428	6.591	2.347	759.010	237.805	1.00	.50	381 114
5.75	6	7	186	12	1	1	93	80	22	12	1	5	13
	1.486	8.326	94.351	075.502	5.449	2.417	4.718	5.033	706.625	90.283	1.50	.75	80 256
6.0	6	8	194	12	1	1	97	83	23	1	1	6	13
	4.082	1.633	52.463	562.777	5.437	2.405	2.623	7.518	650.627	342.442	2.00	.00	79398
7.5	7	1	237	15	1	1	11	1	29	1	1	1	13
	9.143	00.819	32.846	332.208	5.343	2.332	86.642	022.147	335.295	647.830	8.75	1.25	67809
7.75	8	1	24	157	1	1	12	10	30	1	1	1	13
	1.668	04.035	449.859	93.887	5.330	2.321	22.493	52.926	258.901	697.694	9.38	1.63	66736
8.0	8	1	25	16	1	1	12	10	31	1	2	1	13
	4.185	07.242	162.439	252.708	5.318	2.311	58.122	83.514	178.887	747.242	0.00	2.00	65663

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Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer radius mm	Nominal inner radius mm	Surface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
400	300	*±2.50*	9.5	9	1	293	189	1	1	14	12	366	20	2	1	13
				9.139	26.291	47.115	47.820	5.244	2.249	67.356	63.188	22.117	37.957	3.75	4.25	59225
			9.75	1	1	30	193	1	1	15	1	375	20	2	1	1
				01.605	29.433	029.832	87.759	5.232	2.239	01.492	292.517	16.434	85.323	4.38	4.63	358
																152
			10.0	1	1	30	198	1	1	15	1	384	21	2	1	1
				04.065	32.566	708.461	25.172	5.220	2.229	35.423	321.678	07.038	32.380	5.00	5.00	357
																079

			11.5	1	1	34	22	1	1	17	1	438	24	3	2	13
				17.777	50.034	390.240	294.198	5.140	2.190	19.512	486.280	00.652	03.551	4.50	3.00	40769
			11.7	1	1	350	22	1	1	1	1	446	24	3	2	13
			5	20.146	53.052	35.197	717.770	5.130	2.183	751.760	514.518	65.916	48.157	5.25	3.50	39482
			12.0	1	1	35	23	1	1	17	1	45	2	3	2	13
				22.507	56.059	676.953	139.887	5.120	2.177	83.848	542.659	527.092	492.447	6.00	4.00	38 194
400	350	*±2.80*	5.0	5	7	18	14	1	1	91	85	25	1	1	5	1
				7.585	3.356	343.806	986.361	5.813	4.293	7.190	6.363	304.205	326.871	0.00	.00	482
																831
			6.0	6	8	217	17	1	1	1	10	30	1	1	6	14
				8.792	7.633	81.183	788.634	5.765	4.247	089.059	16.493	165.481	575.214	2.00	.00	79398
			8.0	9	1	28	23	1	1	1	1	39	2	2	1	14
				0.465	15.242	236.145	061.015	5.653	4.146	411.807	317.772	819.429	054.388	0.00	2.00	65663
			10.0	1	1	34	28	1	1	17	1	49	25	2	1	1
				11.915	42.566	511.794	179.110	5.559	4.059	25.590	610.235	124.504	12.288	5.00	5.00	457
																079
			12.0	1	1	40	32	1	1	20	18	58	29	3	2	1

				31.927	68.059	194.713	875.808	5.465	3.986	09.736	78.618	334.485	43.525	6.00	4.00	438 194
450	250	±2.80	6.0	6	8	22	9	1	1	10	74	20	1	1	6	13
				4.082	1.633	729.923	250.551	6.687	0.645	10.219	0.044	686.681	252.590	2.00	.00	79398
			8.0	8	1	29	11	1	1	13	95	27	1	2	1	13
				4.185	07.242	376.100	956.639	6.551	0.559	05.604	6.531	222.452	627.585	0.00	2.00	65663
			10.0	1	1	35	14	1	1	15	1	33	1	2	1	13
				04.065	32.566	835.725	569.147	6.441	0.483	92.699	165.532	473.360	983.038	5.00	5.00	57079
			12.0	1	1	41	17	1	1	18	1	395	2	3	2	1
				22.507	56.059	529.601	055.469	6.313	0.454	45.760	364.438	90.937	313.553	6.00	4.00	338 194
450	350	±2.70	6.0	7	9	28	19	1	1	12	1	358	17	1	6	1
				3.502	3.633	644.363	563.854	7.491	4.455	73.083	117.935	55.630	78.047	2.00	.00	579 398
			8.0	9	1	37	25	1	1	1	1	47	23	2	1	15
				6.745	23.242	191.514	400.721	7.372	4.356	652.956	451.470	353.695	21.670	0.00	2.00	65663
			10.0	1	1	45	31	1	1	2	1	584	28	2	1	1
				19.765	52.566	517.392	069.943	7.273	4.271	022.995	775.425	58.337	42.457	5.00	5.00	557

															079
	12.0	1	1	53	363	1	1	23	20	694	33	3	2	1	
		41.347	80.059	043.121	04.568	7.164	4.199	57.472	74.547	67.907	35.040	6.00	4.00	538	
														194	

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
500	200	*±3.10*	6.0	64.082	8.1633	25695.795	6226.737	17.742	8.734	1027.832	62.674	16187.769	1102.888	12.00	6.00	1.37939 8

			8.0	84.185	1 07.242	33 162.293	8 033.101	1 7.585	8 .655	1 326.492	80 3.310	21 225.171	1 428.272	2 0.00	1 2.00	1 365663
			10.0	104.065	1 32.566	40 420.068	9 770.202	1 7.462	8 .585	1 616.803	97 7.020	26 004.902	17 34.355	2 5.00	1 5.00	1 357079
			12.0	12 2.507	1 56.059	46 704.992	11 493.795	1 7.300	8 .582	1 868.200	11 49.379	30 620.071	20 15.768	3 6.00	2 4.00	1 338 194
50 0	30 0	*±3.20*	5.5	67.519	8 6.011	30 414.339	13 970.561	1 8.805	1 2.745	1 216.574	93 1.371	29 820.325	1 555.794	1 1.00	5. 50	1 581 114
			5.75	70.513	8 9.826	31 719.084	14 565.082	1 8.791	1 2.734	12 68.763	97 1.005	31 122.630	16 22.160	1 1.50	5. 75	1 580 256
			6.0	73.502	9 3.633	33 017.235	15 156.217	1 8.778	1 2.723	13 20.689	1 010.414	32 420.305	1 688.158	1 2.00	6. 00	1 579 398

7.5	90.918	1	40	18	1	1	1	1	40	20	1	1	1
		15.819	383.476	541.271	8.673	2.653	615.339	236.085	228.853	75.564	8.75	1.25	567809
7.75	93.835	1	41	19	1	1	1	1	41	21	1	1	1
		19.535	618.006	104.303	8.659	2.642	664.720	273.620	500.431	38.928	9.38	1.63	566736
8.0	96.745	1	42	19	1	1	17	13	42	2	2	1	1
		23.242	845.707	664.121	8.645	2.632	13.828	10.941	767.404	201.929	0.00	2.000	565663
9.5	114.054	1	50	22	1	1	20	15	50	25	2	1	1
		45.291	070.933	957.786	8.564	2.570	02.837	30.519	271.871	72.346	3.75	4.25	559225
9.75	116.913	1	51	23	1	1	20	1	51	26	2	1	1
		48.933	252.067	496.250	8.551	2.560	50.083	566.417	506.274	32.828	4.38	4.63	558152
10.0	119.765	1	52	24	1	1	20	1	52	26	2	1	1
		52.566	426.735	031.839	8.537	2.551	97.069	602.123	735.976	92.954	5.00	5.00	557079

			11.5	135.832	1	58	27	1	1	23	18	60	3	3	2	1
					73.034	776.360	082.587	8.430	2.511	51.054	05.506	188.333	041.552	4.50	3.00	540769
			11.75	138.593	1	59	27	1	1	23	18	61	30	3	2	1
					76.552	889.342	601.897	8.418	2.504	95.574	40.126	387.281	98.896	5.25	3.50	539482
			12.0	141.347	1	60	28	1	1	24	18	62	3	3	2	1
					80.059	996.512	119.407	8.405	2.497	39.860	74.627	581.153	155.877	6.00	4.00	538194
500	350	*±3.60*	8.0	109.305	1	59	30	2	1	21	17	63	28	2	1	1
					39.242	823.844	080.135	0.728	4.698	75.412	18.865	051.196	56.297	0.00	2.00	765663
			10.0	135.465	1	73	36	2	1	26	21	77	35	2	1	1
					72.566	374.825	851.610	0.620	4.613	68.175	05.806	901.183	02.913	5.00	5.00	757079
			12.0	160.187	2	85	43	2	1	31	24	92	4	3	2	1
					04.059	642.167	162.088	0.486	4.544	14.261	66.405	645.645	118.259	6.00	4.00	738194

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Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

5

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
550	350	*±3.60*	14.0	185.062	235.748	996.667	458.909	20.388	14.484	3563.515	2826.223	6762.190	4710.380	42.00	28.00	1727893
600	400	*±4.00*	7.5	114.468	145.819	990.347	066.284	2.828	6.782	533.012	053.314	338.658	80.519	8.75	1.25	967809
			7.75	11	1	78	42	2	1	2	2	86	3	1	1	1

	8.170	50.535	355.639	338.419	2.815	6.771	611.855	116.921	008.668	485.831	9.38	1.63	966736
8.0	12	1	80	43	2	1	2	2	88	35	2	1	1
	1.865	55.242	710.512	604.679	2.801	6.760	690.35	180.234	671.548	90.678	0.00	2.00	965663
9.5	14	1	94	51	2	1	3	2	10	42	2	1	1
	3.884	83.291	623.525	081.262	2.721	6.694	154.117	554.063	4 498.190	10.086	3.75	4.25	959225
9.75	14	1	96	52	2	1	3	2	10	43	2	1	1
	7.528	87.933	906.776	307.619	2.708	6.683	230.226	615.381	7 110.710	11.718	4.38	4.63	958152
10.0	15	1	99	53	2	1	3	2	10	4	2	1	1
	1.165	92.566	179.994	528.461	2.695	6.673	306.000	676.423	9 715.970	412.893	5.00	5.00	957079
11.5	17	2	11	60	2	1	3	3	12	5	3	2	1
	1.942	19.034	1 730.810	433.657	2.586	6.611	724.360	021.683	5 560.760	005.732	4.50	3.00	940769
11.7	17	2	11	61	2	1	3	3	12	5	3	2	1

5	5.488	23.552	3903.52	610.892	2.572	6.601	796.784	080.545	8124.330	103.431	5.25	3.50	939482
12.0	17	2	11	62	2	1	3	3	13	5	3	2	1
	9.027	28.059	6066.57	783.513	2.560	6.592	868.885	139.176	0680.300	200.669	6.00	4.00	938194
13.5	20	2	12	69	2	1	4	3	14	5	4	2	1
	0.087	54.888	847.70	727.897	2.483	6.540	294.923	486.395	5854.610	774.444	0.50	7.00	930468
13.75	20	2	13	70	2	1	4	3	14	5	4	2	1
	3.568	59.323	0946.01	871.031	2.471	6.532	364.867	543.552	8356.430	868.470	1.25	7.50	929181
14.0	20	2	13	72	2	1	4	3	15	5	4	2	1
	7.042	63.748	3035.51	010.374	2.459	6.524	434.517	600.519	0850.380	962.040	2.00	8.00	927893
15.5	22	2	14	78	2	1	4	3	16	6	4	3	1
	7.712	90.078	5393.93	773.167	2.388	6.479	846.464	938.658	5646.880	513.909	6.50	1.00	920167
15.7	23	2	14	79	2	1	4	3	16	6	4	3	1

			5	1.128	94.431	7425.02	889.181	2.377	6.472	914.167	994.459	8084.790	604.302	7.25	1.50	918880
			16.0	234.536	298.772	14948.252	8102.341	2.365	6.466	981.608	4050.117	170514.560	694.243	8.00	2.00	1917592
70		±	*6.00*	12.0	179.027	228.060	13451.600	3685.440	4.728	2.855	984.331	2512.363	97497.640	483.173	6.00	4.00	1938194
0	00															
			14.0	207.042	263.748	9389.108	938.780	4.583	2.759	553.975	862.585	3370.600	25.963	2.00	8.00	1927893
			16.0	234.536	298.772	17405.102	913.210	4.436	2.664	097.289	194.214	7765.300	740.022	8.00	2.00	1917592

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length	Dimensi	All	Theoretica	Sectional	Moment of inertia cm^4	Radius of gyration	Elastic section modulus	Torsiona	Torsional	Nominal	Nominal	Surface

mm		onal toleran ce mm	thick ness mm	l weight per unit length kg/m	area cm^2			cm		cm^3		l consta nt cm^4	modulu s cm^3	outer radius mm	inner radius mm	area per meter mm^2/ m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
700	300	*±6.00*	18.0	261.510	333.134	196508.106	52614.280	24.287	12.567	5614.516	3507.618	141667.900	63125.706	54.00	36.00	1907291
			20.0	287.963	366.832	213706.503	57047.540	24.137	12.471	6105.901	3803.169	155064.800	6883.342	60.00	40.00	1896990
			24.0	339.307	432.238	245424.105	65132,980	23.829	12.275	7012.117	4342.198	180288.500	7915.694	72.00	48.00	1876388

			30.0	41	52	28	75	2	1	8	5	21	92	9	6	1
				2.417	5.372	6	392.520	3.349	1.979	183.732	026.16	4	60.998	0.00	0.00	84548
						430.60					8	005.10				6
												0				
700	400	±6.00	10.0	16	21	14	61	2	1	4	3	13	51	2	1	2
				6.865	2.566	3	036.000	5.978	6.945	098.737	051.80	5	73.348	5.00	5.00	15707
						455.80					0	991.00				9
												0				
			12.0	19	25	16	71	2	1	47	3	16	61	3	2	2
				7.867	2.060	7	426.030	5.806	6.834	95.860	571.30	2	03.876	6.00	4.00	13819
						855.10					2	019.30				4
												0				
			14.0	22	29	19	81	2	1	54	4	18	7	4	2	2
				9.022	1.748	2	716.580	5.676	6.736	95.297	085.82	7	004.940	2.00	8.00	12789
						335.40					9	119.00				3
												0				
			16.0	25	33	21	91	2	1	6	4	21	7	4	3	2
				9.656	0.772	5	563.560	5.545	6.638	166.869	578.17	1	873.813	8.00	2.00	11759
						840.40					8	627.00				2

											0					
			18.0	28	36	23	10	2	1	6	50	23	87	5	3	2
				9.770	9.134	8379.00	0	5.412	6.539	810.827	48.678	5	10.824	4.00	6.00	10729
							973.600					525.20				1
												0				
			20.0	31	40	25	10	2	1	74	54	25	9	6	4	2
				9.363	6.832	9	9	5.278	6.440	27.425	97.661	8	516.281	0.00	0.00	096
						959.90	953.200					795.90				990
												0				
			24.0	37	48	30	12	2	1	85	63	30	11	7	4	2
				6.987	0.238	0	6	5.006	6.239	79.550	32.403	3	033.680	2.00	8.00	07638
						284.30	648.100					383.50				8
												0				
			30.0	45	58	35	14	2	1	10	74	36	13	9	6	2
				9.517	5.372	3	8	4.585	5.934	108.870	31.457	5	079.820	0.00	0.00	04548
						810.60	629.10					117.40				6
												0				
700	500	*±6.50*	16.0	28	36	25	15	2	2	7	6	30	10	4	3	2

	4.776	2.772	3	1752.50	6.423	0.453	236.449	070.10	7	009.770	8.00	2.00	31759
			275.70					1	111.10				2
									0				
18.0	31	40	28	16	2	2	80	6	34	11	5	3	2
	8.030	5.134	0	7	6.301	0.351	07.138	711.58	2	098.970	4.00	6.00	30729
			249.80	789.50				2	467.40				1
									0				
20.0	35	44	30	18	2	2	8	73	37	12	6	4	2
	0.763	6.832	6	3	6.178	0.248	748.948	28.020	7	153.300	0.00	0.00	29699
			213.20	200.50					079.70				0
									0				
24.0	41	52	35	21	2	2	10	84	44	14	7	4	2
	4.667	8.238	5	2	5.929	0.042	146.980	87.002	3	158.520	2.00	8.00	27638
			144.40	175.00					988.10				8
									0				
30.0	50	64	42	25	2	1	12	10	53	16	9	6	2
	6.617	5.372	1	1	5.547	9.726	034.020	045.38	8	911.500	0.00	0.00	24548
			190.60	134.40				0	246.30				6
									0				

700	600	±6.50	20.0	38 2.163	48 6.832	35 2 466.50	27 8 789.40	2 6.907	2 3.930	10 070.470	9 292.97 9	50 6 328.90 0	14 792.350	6 0.00	4 0.00	2 49699 0
			24.0	45 2.347	57 6.238	41 0004.60	32 4 113.90	2 6.674	2 3.716	11 714.420	10 803.80 0	59 7 726.50 0	17 286.730	7 2.00	4 8.00	2 47638 8

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm	Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s

700	600	±*6.50*	30.0	55	7	48	38	2	2	13	12	72	20	9	6	2
				3.717	05.372	8	5	6.318	3.390	959.16	863.61	7	749.50	0.00	0.00	44548
						570.60	908.20			0	0	773.600	0			6
800	400	±*7.00*	20.0	35	4	36	12	2	1	90	6	31	10	6	4	2
				0.763	46.832	2	4	8.480	6.686	60.799	220.32	0	960.58	0.00	0.00	29699
						431.90	406.60				8	637.700	0			0
			24.0	41	5	41	14	2	1	10	7	36	12	7	4	2
				4.667	28.238	9	3	8.197	6.490	499.37	181.81	4	730.83	2.00	8.00	27638
						974.90	636.20			0	1	513.400	0			8
			30.0	50	6	49	16	2	1	12	84	43	15	9	6	2
				6.617	45.372	7	9	7.760	6.192	433.04	60.457	9	134.87	0.00	0.00	24548
						321.60	209.10			0		488.700	0			6
			40.0	64	8	60	20	2	1	15	10	54	18	1	8	2
				9.452	27.328	2984.9	3	6.997	5.686	074.62	178.77	7720.80	487.71	20.00	0.00	19398
						0	575.40			0	0	0	0			1
800	500	±*5.50*	20.0	38	4	42	20	2	2	10	82	45	13	6	4	2
				2.163	86.832	3	6	9.487	0.583	582.13	50.153	6077.00	996.18	0.00	0.00	49699
						285.30	253.80			0		0	0			0

			24.0	45	5	49	23	2	2	12	9	53	16	7	4	2
				2.347	76.238	2	9	9.228	0.382	306.48	575.48	7545.70	333.21	2.00	8.00	47638
						259.10	387.20			0	8	0	0			8
			30.0	55	7	58	28	2	2	14	11	65	19	9	6	2
				3.717	05.372	6	4	8.830	0.077	657.54	372.58	2	561.81	0.00	0.00	44548
						301.60	314.40			0	0	836.900	0			6
			36.0	65	8	66	32	2	1	16	12	75	22	1	7	2
				0.401	28.536	9	3	8.422	9.766	732.24	948.32	9	463.93	08.00	2.00	41458
						289.60	708.10			0	0	316.400	0			3
			40.0	71	9	71	34	2	1	17	13	82	24	1	8	2
				2.252	07.328	8	7	8.143	9.556	965.29	880.19	5	220.14	20.00	0.00	39398
						611.50	004.80			0	0	124.800	0			1
800	600	*±6.00*	20.0	41	5	48	31	3	2	12	10	61	17	6	4	2
				3.563	26.832	4	2	0.314	4.353	103.47	414.76	6	034.14	0.00	0.00	69699
						138.60	442.70			0	0	393.700	0			0
			24.0	49	6	56	36	3	2	14	12	72	19	7	4	2
				0.027	24.238	4	3	0.073	4.146	113.58	131.67	8	939.58	2.00	8.00	67638
						543.30	950.10			0	0	433.300	0			8

			30.0	60	7	67	43	2	2	16	14	88	23	9	6	2
				0.817	65.372	5	4	9.703	3.832	882.04	489.61	8538.40	996.21	0.00	0.00	645
						281.60	688.20			0	0	0	0			486
			36.0	70	9	77	49	2	2	19	16	1	27	1	7	2
				6.921	00.536	4	7	9.325	3.512	360.82	593.94	038	696.98	08.00	2.00	614
						432.70	818.20			0	0	506.00	0			583
			40.0	77	9	83	53	2	2	20	17	11	29	1	8	2
				5.052	87.328	4	5800.7	9.068	3.295	855.96	860.02	32525.0	969.35	20.00	0.00	59398
						238.20	0			0	0	0	0			1
800	700	±7.00	20.0	44	5	54	44	3	2	13	12	78	20	6	4	2
				4.963	66.832	4	4	1.008	8.018	624.80	713.52	8	073.46	0.00	0.00	89699
						991.90	973.20			0	0	438.30	0			0
			24.0	52	6	63	51	3	2	15	14	93	23	7	4	2
				7.707	72.238	6	9724.9	0.779	7.805	920.69	849.28	3	548.20	2.00	8.00	87638
						827.40	0			0	0	351.60	0			8
			30.0	64	8	76	62	3	2	19	17	1	28	9	6	2
				7.917	25.372	4	3330.6	0.430	7.481	106.54	809.45	141	434.85	0.00	0.00	84548
						261.60	0			0	0	718.00	0			6

		36.0	76	9	87	71	3	2	21	20	1	32	1	7	2
			3.441	72.536	9	6	0.073	7.151	989.39	484.43	338	937.06	08.00	2.00	81458
					575.70	955.10			0	0	629.00	0			3

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Sectional area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
800	700	*±7.00*	40.0	837.852	10 67.328	949 864.90	73 962.90	2 9.832	2 6.928	3 746.620	22 113.230	1 463 177.00	35 727.960	12 0.00	80 .00	27 93981
900	40	*±5.50*	20.0	382	48	487	1	3	1		6	36	12	60	40	24

0		.163	6.832	245.600	38	1.636	6.889	0	942.994	3460.80	405.110	.00	.00	96990
					859.			827.						
					90			680						
	24.0	452	57	566	1	3	1		8	42	14	72	48	24
		.347	6.238	077.60	60	1.343	6.696	2	031.219	6	428.360	.00	.00	76388
					624.			579.		780.00				
					40			500						
	30.0	553	70	673	1	3	1		94	51	17	90	60	2
		.717	5.372	101.20	89	0.891	6.403	4	89.457	5212.20	190.600	.00	.00	445
					789.			957.						486
					10			810						
	36.0	650	82	766	2	3	1		10	59	19	10	72	24
		.401	8.536	921.00	14	0.424	6.107	7	747.590	5	632.480	8.00	.00	14583
					951.			042.		366.20				
					80			690						
	40.0	712	90	822	2	3	1		11	64	21	12	80	23
		.252	7.328	279.90	29	0.104	5.908	8	480.100	3977.40	085.750	0.00	.00	93981
					602.			272.						
					00			890						

900	500	±6.50	20.0	413.563	52 6.832	564 699.00	29 307.20	3 2.740	2 0.863	2 548.870	9 172.287	53 7 081.20	15 839.360	60 .00	40 .00	26 96990
			22.0	452.055	57 5.867	612 232.20	48 295.10	3 2.606	2 0.765	3 605.160	9 931.803	58 5769.50	17 194.020	66 .00	44 .00	26 86689
			24.0	490.027	62 4.238	658 185.70	66 599.40	3 2.471	2 0.666	4 626.350	10 663.980	63 3 454.90	18 508.420	72 .00	48 .00	26 76388
			26.0	527.478	67 1.946	702 570.80	84 228.40	3 2.335	2 0.567	5 612.690	11 369.140	68 0 114.90	19 782.870	78 .00	52 .00	26 66088
			28.0	564.408	71 8.991	745 398.90	3 01 190.	3 2.198	2 0.467	6 564.	12 047.630	72 5 727.30	21 017.650	84 .00	56 .00	26 55787

				60			420						
30.0	600.817	76 5.372	786 681.20	17 494.40	3 2.060	2 0.367	7 481.810	12 699.780	77 0 269.90	22 213.040	90 .00	60 .00	2 645 486
32.0	636.706	81 1.090	826 429.30	33 148.10	3 1.920	2 0.267	8 365.100	13 325.920	81 3720.60	23 369.290	96 .00	64 .00	2 635 185
34.0	672.073	85 6.144	864 654.40	48 160.20	3 1.780	2 0.166	9 214.540	13 926.410	85 6057.50	24 486.640	10 2.00	68 .00	2 624 884
36.0	706.921	90 0.536	901 368.10	62 539.10	3 1.637	2 0.064	0 030.400	14 501.570	89 7 259.10	25 565.350	10 8.00	72 .00	2 614 583
38.0	741	94	936	3	3	1	2	15	93	26	11	76	26

		.247	4.264	581.60	76 293. 40	1.494	9.963	0 812. 930	051.740	7303.60	605.620	4.00	.00	04282
	40.0	775 .052	98 7.328	970 306.60	89 431. 50	3 1.349	1 9.860	1 562. 370	15 577.260	97 6 169.90	27 607.660	12 0.00	80 .00	25 93981
	42.0	808 .337	10 29.729	100 2554.00	01 961. 90	4 3 1.203	1 9.757	2 278. 990	16 078.470	1 013837. 00	28 571.690	12 6.00	84 .00	25 83680
	44.0	841 .102	1 071.46 7	1 033 336.00	13 893. 00	4 3 1.055	1 9.654	2 963. 030	16 555.720	1 050 284.00	29 497.890	13 2.00	88 .00	25 73379

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side	Di	V	The	Se	Moment of	Radius of	Elast	Tor	To	N	N	S

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length mm		mensional tolerance mm	all thickness mm	oretical weight per unit length kg/m	ctional area cm^2	inertia cm^4		gyration cm		ic section modulus cm^3		sional constant cm^4	rsional modulus cm^3	ominal outer radius mm	ominal inner radius mm	urface area per meter mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
900	500	±6.50	46.0	873.345	112.541	2664.005	233.601	0.906	9.550	3614.760	009.340	085490.00	386.430	8.00	.00	63078
			48.0	905.068	152.952	0 550.00	992.00	0.755	9.446	4234.430	439.680	119436.00	237.510	4.00	.00	52777
			50.0	936.270	192.700	117004.00	176.90	0.603	9.341	4822.300	847.080	152101.00	051.280	0.00	0.00	42477

900	600	±6.00	20.0	444.963	56 6.832	642 152.30	34 6 096.00	3 3.658	2 4.710	4 270.050	1 536.540	729 923.20	19 276.330	60 .00	40 .00	28 96990
			22.0	486.595	61 9.867	697 047.20	37 5 404.30	3 3.534	2 4.609	5 489.940	2 513.480	797 152.10	20 956.500	66 .00	44 .00	28 86689
			24.0	527.707	67 2.238	750 293.90	40 3 786.30	3 3.408	2 4.508	6 673.200	3 459.540	863 229.80	22 593.070	72 .00	48 .00	28 76388
			26.0	568.298	72 3.946	801 904.00	43 1 251.20	3 3.282	2 4.407	7 820.090	4 375.040	928 130.50	24 186.340	78 .00	52 .00	28 66088
			28.0	608.368	77 4.991	851 889.20	45 7808.70	3 3.155	2 4.305	8 930.	5 260.	991 828.50	25 736.600	84 .00	56 .00	28 55787

							870	290					
30.0	647	82	900	48	3	2	0	6	1	27	90	60	28
	.917	5.372	261.20	3	3.026	4.202	005.	115.	054	244.120	.00	.00	45486
				468.20			810	610	298.00				
32.0	686	87	947	50	3	2	1	6	1	28	96	64	2
	.946	5.090	031.80	8	2.897	4.099	045.	941.	115	709.140	.00	.00	835
				239.10			150	300	514.00				185
34.0	725	92	992	53	3	2	2	7	1	30	10	68	28
	.453	4.144	212.50	2	2.767	3.996	049.	737.	175	131.930	2.00	.00	24884
				130.90			170	700	449.00				
36.0	763	97	1	55	3	2	3	8	1	31	10	72	28
	.441	2.536	035	5	2.635	3.892	018.	505.	234	512.700	8.00	.00	14583
			815.00	153.20			110	110	080.00				
38.0	800	10	1	57	3	2			1	32	11	76	28

	.907	20.264	077	7	2.503	3.788	3	9	291	851.680	4.00	.00	04282
			851.00	315.50			952.	243.	381.00				
							260	850					
40.0	837	10	111	59	3	2			1	34	12	80	27
	.852	67.328	8333.00	8627.30	2.370	3.683	4	9	347	149.080	0.00	.00	93981
							851.	954.	325.00				
							850	240					
42.0	874	1	115	61	3	2			1	35	12	84	27
	.277	113.72	7272.00	9	2.235	3.577	5	0	401	405.110	6.00	.00	83680
		9		098.20			717.	636.	890.00				
							160	610					
44.0	910	1	119	63	3	2			1	36	13	88	27
	.182	159.46	4680.00	8	2.099	3.471	6	1	455	619.950	2.00	.00	73379
		7		737.80			548.	291.	049.00				
							450	260					
46.0	945	1	1	65	3	2			150	37	13	92	27
	.565	204.54	230	7	1.963	3.364	7	1	6778.00	793.770	8.00	.00	63078
		1	569.00	555.60			345.	918.					
							980	520					

		48.0	980	12	126	67	3	2	:	:	1	38	14	96	27	
			.428	48.952	4 951.00	5	1.825	3.257	8	2	557	926.770	4.00	.00	52777	
						561.20			110.	518.	052.00					
									020	710						
		50.0	1	12	1	69	3	2	:	:	160	40	15	10	27	
			014.770	92.700	297	2	1.686	3.15	8	3	5 848.00	019.090	0.00	0.00	42477	
					837.00	764.40			840.	092.						
									820	150						

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Side length mm		Dimensional tolerance mm	Wall thickness mm	Theoretical weight per unit length kg/m	Section area cm^2	Moment of inertia cm^4		Radius of gyration cm		Elastic section modulus cm^3		Torsional constant cm^4	Torsional modulus cm^3	Nominal outer arc radius mm	Nominal inner arc radius mm	Surface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s

900	700	±*7.00*	20.0	47	6	71	49	3	2	15	14	93	22	6	4	3
				6.363	06.832	9	1	4.436	8.452	991.24	035.04	8	714.86	0.00	0.00	09699
						605.60	226.50			0	0	185.70	0			0
			24.0	56	7	84	57	3	2	18	16	1	26	7	4	3
				5.387	20.238	2	4	4.200	8.245	720.05	416.72	111	680.32	2.00	8.00	07638
						402.00	585.10			0	0	486.00	0			8
			30.0	69	8	10	69	3	2	22	19	13	32	9	6	3
				5.017	85.372	13	0	3.839	7.931	529.81	734.59	61	280.09	0.00	0.00	045
						841.00	710.60			0	0	407.00	0			486
			36.0	81	1	1	79	3	2	26	22	15	37	1	7	3
				9.961	044.53	170	6	3.472	7.612	005.83	754.12	98607.0	468.21	08.00	2.00	014
					6	262.00	394.10			0	0	0	0			583
			40.0	90	1	12	86	3	2	28	24	1	40	1	8	2
				0.652	147.32	66360.0	1	3.223	7.397	141.33	605.42	749	701.47	20.00	0.00	993
					8	0	189.60			0	0	294.00	0			981
1000	400	±*5.00*	20.0	41	5	63	15	3	1	12	7	41	13	6	4	2
				3.563	26.832	6	3	4.756	7.059	728.02	665.66	7	849.81	0.00	0.00	696
						400.90	313.20			0	1	041.70	0			990

			24.0	49	6	74	17	3	1	14	88	48	16	7	4	2
				0.027	24.238	0	7	4.453	6.868	819.84	80.627	9	126.15	2.00	8.00	67638
						992.10	612.50			0		921.00	0			8
			30.0	60	7	88	21	3	1	17	10	59	19	9	6	2
				0.817	65.372	4	0	3.988	6.579	682.99	518.46	1970.00	246.79	0.00	0.00	645
						149.50	369.10			0	0		0			486
			36.0	70	9	10	23	3	1	20	11	68	22	1	7	2
				6.921	00.536	11	8878.9	3.508	6.287	222.45	943.94	4	022.34	08.00	2.00	614
						122.00	0			0	0	874.30	0			583
			40.0	77	9	10	25	3	1	21	12	74	23	1	8	2
				5.052	87.328	86941.0	5	3.180	6.091	738.83	781.44	1506.00	684.75	20.00	0.00	59398
						0	628.70			0	0		0			1
1000	500	*±6.50*	20.0	44	5	73	25	3	2	14	10	61	17	6	4	2
				4.963	66.832	2	2	5.947	1.100	649.09	094.42	9	682.76	0.00	0.00	89699
						454.20	360.50			0	0	667.40	0			0
			24.0	52	6	85	29	3	2	17	11	73	20	7	4	2
				7.707	72.238	5	3	5.670	0.906	106.48	752.46	1	683.99	2.00	8.00	87638
						324.20	811.50			0	0	211.90	0			8

			30.0	64	8	10	35	3	2	20	14	88	24	9	6	2
				7.917	25.372	25	0	5.246	0.612	506.59	026.98	9	864.91	0.00	0.00	84548
						329.00	674.40			0	0	925.40	0			6
			36.0	76	9	11	40	3	2	23	16	10	28	1	7	2
				3.441	72.536	78473.0	1	4.810	0.315	569.47	054.81	37775.0	667.80	08.00	2.00	81458
						0	370.20			0	0	0	0			3
			40.0	83	1	12	43	3	2	25	17	11	30	1	8	2
				7.852	067.32	71368.0	1	4.513	0.115	427.36	274.33	30012.0	996.55	20.00	0.00	79398
					8	0	858.20			0	0	0	0			1
1000	600	±6.80	20.0	47	6	82	37	3	2	16	12	84	21	6	4	3
				6.363	06.832	8507.60	9	6.95	5.016	570.15	658.31	6232.10	518.80	0.00	0.00	09699
							749.40			0	0		0			0
			26.0	60	7	1	47	3	2	20	15	1	27	7	5	3
				9.118	75.946	037	4	6.562	4.719	744.88	803.75	076	041.52	8.00	2.00	06608
						244.00	112.40			0	0	886.00	0			8

Table 2 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of rectangular steel sections (continued)

Si	Di	V	Th	S	Moment of	Radius	Elastic	To	To	N	N	S

de length mm	mensional tolerance mm	all thickness mm	eoretical weight per unit length kg/m	ectional area cm^2	inertia cm^4		of gyration cm		section modulus cm^3		rsional constant cm^4	rsional modulus cm^3	ominal outer arc radius mm	ominal inner arc radius mm	urface area per meter length mm^2/m
H	B_1	$\pm\Delta$	t	M	A	I_x	I_y	r_x	r_y	W_x	W_y	I_t	C_t	R	r	A_s
1000	600	±6.80	30.0	695.017	885.372	66509.00	2248.20	6.298	4.519	330.190	741.610	24037.00	492.850	0.00	0.00	045486
			36.0	819.961	1044.536	45824.00	2488.30	5.895	4.215	916.490	416.280	434310.00	329.760	108.00	2.00	014583
			40.0	900.652	1147.328	45795.00	2454.00	5.621	4.011	115.890	048.470	567216.00	330.600	20.00	0.00	993981
1000	700	±7.00	20.0	506	646	9253	2	3	2	18	15	1	25	6	4	3

00	0			7.763	46.832	4	7	7.807	8.826	491.22	356.57	092	356.58	0.00	0.00	29699
						560.90	479.90			0	0	295.00	0			0
			30.0	74	9	13	75	3	2	26	21	1	36	9	6	3
				2.117	45.372	07	8090.60	7.192	8.318	153.79	659.73	587	126.35	0.00	0.00	24548
						689.00				0	0	421.00	0			6
			36.0	87	1	15	87	3	2	30	25	18	42	1	7	3
				6.481	116.53	13	5	6.814	8.008	263.51	023.81	66036.0	001.03	08.00	2.00	21458
					6	175.00	833.20			0	0	0	0			3
			38.0	92	1	1	91	3	2	31	26	19	43	1	7	3
				0.227	172.26	577	2708.60	6.686	7.903	553.68	077.39	55	862,98	14.00	6.00	20428
					4	684.00				0	0	654.00	0			2
			40.0	96	1	16	94	3	2	32	27	20	45	1	8	3
				3.452	227.32	40	8	6.557	7.798	804.43	097.61	43	677.19	20.00	0.00	19398
					8	221.00	416.20			0	0	595.00	0			1
10	80	*±8.00*	20.0	53	6	10	72	3	3	20	18	13	29	6	4	3
00	0			9.163	86.832	20614.0	7	8.548	2.547	412.29	188.80	54	195.46	0.00	0.00	49699
						0	551.90			0	0	449.00	0			0
			24.0	64	8	11	85	3	3	23	21	1	34	7	4	3

	0.747	16.238	98321.000	3679.900	8.316	2.340	966.410	342.000	607537.000	380.820	2.00	8.00	476388
30.0	78	1	14	10	3	3	28	25	1	41	9	6	3
	9.217	005.372	48869.00	31202.00	7.962	2.026	977.390	780.040	974836.00	763.310	0.00	0.00	445486
32.0	83	1	15	10	3	3	30	27	20	44	9	6	3
	7.666	067.090	28170.00	87311.00	7.843	1.921	563.390	182.780	93851.000	119.840	6.00	4.00	435185
36.0	93	1	16	11	3	3	33	29	23	48	1	7	3
	3.001	188.536	80526.00	95005.00	7.602	1.709	610.530	875.120	26559.000	678.080	08.00	2.00	414583
40.0	10	1	18	12	3	3	36	32	25	53	1	8	3
	26.252	307.328	24648.00	96745.00	7.359	1.495	492.960	418.620	51957.00	031.540	20.00	0.00	393981

Table 3 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of round steel sections

Nominal outside	Permissible deviation	Nominal wall thickness	Theoretical weight per unit	Cross-sectional	Moment of inertia	Radius of gyration	Elastic modulus	Plastic modulus	Torsional constant	Torsional modulus	Surface area per meter

diameter mm	mm	mm	length kg/m	area cm^2	cm^4	cm	cm^3	cm^3	cm^4	cm^3	mm^2/m
D	±Δ	t	M	A	I	R	Z	S	J	C	A_s
21.00 (21.30)	±0.50	1.2	0.595	0.758	0.384	0.712	0.361	0.485	0.768	0.721	66.916
		1.5	0.732	0.933	0.460	0.702	0.432	0.589	0.920	0.864	66.916
		1.75	0.844	1.075	0.518	0.694	0.486	0.671	1.035	0.972	66.916
		2.0	0.952	1.213	0.571	0.686	0.536	0.748	1.141	1.072	66.916
		2.5	1.159	1.477	0.664	0.671	0.623	0.889	1.328	1.247	66.916
		3.0	1.354	1.725	0.741	0.656	0.696	1.014	1.483	1.392	66.916
26.80 (26,90)	±0.50	1.2	0.758	0.965	0.792	0.906	0.591	0.787	1.585	1.183	84.195

		1.5	0.936	1.192	0.95	0.8	0.7	0.9	1.915	1.429	84195
		1.75	1.081	1.377	1.08	0.8	0.8	1.1	2.171	1.620	84195
		2.0	1.223	1.558	1.20	0.8	0.9	1.2	2.412	1.800	84195
		2.5	1.498	1.909	1.42	0.8	1.0	1.4	2.847	2.125	84195
		3.0	1.761	2.243	1.61	0.8	1.2	1.7	3.227	2.408	84195
33.50 (33.70)	*±0.50*	1.5	1.184	1.508	1.93	1.1	1.1	1.5	3.869	2.31	105243
		2.0	1.554	1.979	2.46	1.1	1.4	1.9	4.929	2.943	105243
		2.5	1.911	2.435	2.94	1.1	1.7	2.4	5.887	3.515	105243
		3.0	2.257	2.8	3.37	1.0	2.0	2.8	6.750	4.030	105

				75	5	84	15	00			243
		3.5	2.589	3.2	3.76	1.0	2.2	3.1	7.523	4.491	105
				99	2	68	46	64			243
		4.0	2.910	3.7	4.10	1.0	2.4	3.5	8.213	4.904	105
				07	7	53	52	02			243
42.30	*±0.50*	1.5	1.509	1.9	4.00	1.4	1.8	2.4	8.012	3.788	132
(42.40)				23	6	43	94	98			889
		2.0	1.988	2.5	5.15	1.4	2.4	3.2	10.30	4.873	132
				32	3	27	36	51	6		889
		2.5	2.454	3.1	6.21	1.4	2.9	3.9	12.42	5.876	132
				26	4	10	38	65	8		889
		3.0	2.908	3.7	7.19	1.3	3.4	4.6	14.38	6.801	132
				04	3	94	01	42	5		889
		4.0	3.778	4.8	8.92	1.3	4.2	5.8	17.84	8.436	132
				13	1	61	18	89	3		889

Table 3 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of round steel sections (continued)

Nominal outside diameter mm	Permissible deviation mm	Nominal wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic modulus cm^3	Plastic modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Surface area per meter length mm^2/m
D	$\pm\Delta$	t	M	A	I	R	Z	S	J	C	A_s
48.00 (48.30)	± 0.50	1.5	1.720	2.191	5.929	1.645	2.470	3.245	11.857	4.941	150796
		2.0	2.269	2.890	7.659	1.628	3.191	4.235	15.318	6.383	150796
		2.5	2.805	3.574	9.276	1.611	3.865	5.181	18.551	7.730	150796
		3.0	3.329	4.241	10.783	1.595	4.493	6.084	21.566	8.986	150796
		4.0	4.340	5.529	13.491	1.562	5.621	7.765	26.983	11.243	150796
		5.0	5.302	6.756	15.81	1.530	6.591	9.265	31.64	13.18	150

				54	22	31	93	87	4	5	796
60.00 (60.30)	*±0.60*	2.0	2.861	3.644	15.342	2.052	5.114	6.731	30.685	10.228	188496
		2.5	3.545	4.516	18.699	2.035	6.233	8.271	37.398	12.466	188496
		3.0	4.217	5.372	21.878	2.018	7.293	9.756	43.756	14.585	188496
		4.0	5.524	7.037	27.726	1.985	9.242	12.565	55.453	18.484	188496
		5.0	6.782	8.639	32.938	1.953	10.979	15.167	65.875	21.958	188496
75.50 (76.10)	*±0.76*	2.5	4.501	5.733	38.236	2.582	10.129	13.328	76.473	20.258	237190
		3.0	5.364	6.833	44.972	2.565	11.913	15.778	89.943	23.826	237190
		4.0	7.053	8.985	57.596	2.532	15.257	20.470	115.193	30.515	237190

		5.0	8.693	11.074	69.147	2.499	18.317	24.893	138.295	36.634	237190
88.50 (88.90)	±0.90	3.0	6.326	8.058	73.725	3.025	16.661	21.940	147.450	33.322	278031
		4.0	8.336	10.619	94.987	2.991	21.466	28.582	189.973	42.932	278031
		5.0	10.296	13.116	114.721	2.957	25.926	34.903	229.442	51.851	278031
		6.0	12.207	15.551	133.004	2.925	30.057	40.910	266.008	60.115	278031
114.00 (114.30)	±1.15	4.0	10.851	13.823	209.349	3.892	36.728	48.421	418.699	73.456	358142
		5.0	13.441	17.122	254.813	3.858	44.704	59.447	509.627	89.408	358142
		6.0	15.981	20.358	297.729	3.824	52.233	70.056	595.457	104.466	358142

Table 3 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of round steel sections (continued)

Nominal outside diameter mm	Permissible deviation mm	Nominal wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic modulus cm^3	Plastic modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Surface area per meter length mm^2/m
D	$\pm\Delta$	t	M	A	I	R	Z	S	J	C	A_s
140.00 (139.70)	±1.40	4.0	13.416	17.090	395.469	4.810	56.496	74.005	790.937	112.991	439.823
		5.0	16.647	21.206	483.756	4.776	69.108	91.167	967.512	138.216	439.823
		6.0	19.828	25.258	568.062	4.742	81.152	107.808	1136.123	162.303	439.823
165.00 (168.30)	±1.65	4.0	15.882	20.232	655.942	5.694	79.508	103.705	1311.884	159.016	518.363
		5.0	19.729	25.133	805.033	5.660	97.580	128.042	1610.066	195.160	518.363

		6.0	23.527	29.971	948.463	5.625	114.965	151.758	1896.926	229.930	518363
		8.0	30.975	39.458	1218.919	5.558	147.748	197.363	2437.839	295.496	518363
219.10	±2.20	5.0	26.400	33.631	1928.043	7.572	175.997	229.236	3856.086	351.993	688323
		6.0	31.532	40.168	2281.947	7.537	208.302	272.542	4563.895	416.604	688323
		8.0	41.648	53.055	2959.633	7.469	270.163	356.676	5919.266	540.325	688323
		10.0	51.567	65.691	3598.439	7.401	328.475	437.561	7196.878	656.949	688323
273.00	±2.75	5.0	33.046	42.097	3780.815	9.477	276.983	359.162	7561.630	553.966	857655
		6.0	39.508	50.328	4487.084	9.442	328.724	427.806	8974.168	657.448	857655
		8.0	52.282	66.6	5851.	9.3	428.	561.	11	857.3	857

				02	714	73	697	971	703.429	94	655
		10.0	64.860	82.6	7	9.3	524.	692.	14308	1	857
				24	154.093	05	109	023	.185	048.219	655
325.	±3.25	5.0	39.458	50.2	6	11.	396.	512.	12	792.0	1
00				65	435.553	315	034	042	871.105	68	021 018
(323.90)		6.0	47.202	60.1	7	11.	470.	610.	15	941.7	1
				30	651.328	280	851	638	302.655	02	021 018
		8.0	62.542	79.6	10	11.	616.	804.	20	1	102
				71	013.921	211	241	083	027.842	232.483	1 018
		10.0	77.684	98.9	12	11.	756.	992.	24	1512.	102
				60	286.523	143	094	583	573.047	187	1 018
		12.0	92.629	117.	14	11.	890.	1	28	1781.	1
				998	471.449	074	551	176.204	942.898	101	021 018

Table 3 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of round steel sections (continued)

No	Permis	No	Theor	Cro	Mom	Rad	Elast	Plast	Torsi	Torsi	Surf
minal	sible	minal	etical	ss-	ent of	ius of	ic	ic	onal	onal	ace area

outside diameter mm	deviation mm	wall thickness mm	weight per unit length kg/m	sectional area cm^2	inertia cm^4	gyration cm	modulus cm^3	modulus cm^3	constant cm^4	modulus cm^3	per meter length mm^2/m
D	$\pm\Delta$	t	M	A	I	R	Z	S	J	C	A_s
355.60	*±3.55*	6.0	51.730	65,898	10070.553	12.362	566.398	733.393	20141.106	1132.796	111 7 150
		8.0	68.579	87.361	13201.375	12.293	742.485	966.777	26402.749	1484.969	111 7 150
		10.0	85.230	108.573	16223.500	12.224	912.458	1194.727	32446.999	1824.916	111 7 150
		12.0	101.684	129.534	19139.474	12.156	1076.461	1417.308	38278.947	2152.922	111 7 150
406.40	*±4.10*	8.0	78.601	100.129	19873.893	14.088	978.046	1269.951	39747.786	1956.092	1 276 743
		10.0	97.758	124.533	24475.813	14.019	1204.518	1571.663	48951.625	2409.037	1 276 743
		12.0	116.71	148.	28	13.9	1424	1867	57	2	1

			8	685	937.014	51	.066	.192	874.027	848.131	276 743
457.00	±4.60	8.0	88.584	112.846	28 446.363	15.877	1 244.917	1612 .979	56892 .726	2489 .835	1 435 708
		10.0	110.237	140.429	35 091.324	15.808	1535 .725	1998 .423	70 182.648	3 071.451	1 435 708
		12.0	131.692	167.761	41 556.299	15.739	1818 .656	2376 .876	83 112.598	3 637.313	143 5708
508.00	±5.10	8.0	98.646	125.664	39 279.961	17.68	1546 .455	2000 .171	78 559.923	3092 .910	1 595 929
		10.0	122.814	156.451	48 520.246	17.611	1910 .246	2480 .373	97 040.492	3820 .492	1 595 929
		12.0	146.785	186.988	57 536.083	17.541	2265 .2	2952 .768	115 072.166	4 530.400	1 595 929
610.00	±6.10	8.0	118.77	151.299	68 551.354	21.286	2247 .585	2899 .403	137 102.707	4 495.171	191 6372
		10.0	147.969	188.496	84 846.564	21.216	2781 .855	3600 .333	169 693.127	5 563.709	191 6372

	12.5	184.19	234.	104	21.1	3434	4	209	6869	191
		1	638	754.735	29	.581	463.229	509.47	.163	6 372
	16.0	234.38	298.	131	21.0	4320	5	263	8	191
		3	577	781.423	09	.702	646.741	562.845	641.405	6372
	20.0	291.00	370.	161	20.8	5294	6	322	10	191
		5	707	489.507	716	.737	964.666	979.0 139	589.475	6372

Table 3 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of round steel sections (continued)

No minal outside diameter mm	Permi ssible deviation mm	No minal wall thickness mm	Theor etical weight per unit length kg/m	Cro ss-sectional area cm^2	Mome nt of inertia cm^4	Rad ius of gyration cm	Elast ic modulus cm^3	Plasti c modulus cm^3	Torsio nal constant cm^4	Torsi onal modulus cm^3	Surf ace area per meter length mm^2/m
D	$\pm\Delta$	t	M	A	II	R	Z	S	J	C	As
630.	± 7.87	10.0	152.9	194	93	21.	2971	3	187230	5	197
00			01	.778	615.455	9232	.919	844.333	.91	943.838	9203
		12.0	182.8	232	11126	21.	3	4	222535	7	197
			89	.980	7.903	8537	532.314	583.664	.806	064.628	9203

		16.0	242.2	308	145	21.	4	6	291	9	*1*	*979*
			74	.629	539.012	7 155	620.286	033.301	078.024	240.572		
		20.0	300.8	383	178	21.	5	7444.	356	1133	*1*	*979*
			70	.274	461.946	5 783	665.458	666	923.893	0.917		
		25.0	373.0	475	21777	21.	6	9	435	13	*1*	*979*
			04	.165	4.282	4 082	913.469	155.833	548.565	826.938		
660.	*±8.25*	12.0	191.7	244	128	22.	3886	5	256	7	207	
00			67	.29	266.927	9142	.876	039.42	533.855	773.753	3451	
		14.0	223.0	284	14828	22.	4	5	296	8986.	207	
			38	.125	2.204	8449	493.400	843.338	564.409	800	3451	
		16.0	254.1	323	167	22.	5	6	335	10	207	
			11	.709	921.031	7759	088.516	637.141	842.063	177.032	3 451	
		20.0	315.6	402	206	22.	6	8	412	12	207	
			66	.123	088.304	6385	245.100	194.666	176.608	490.200	3451	
		25.0	391.5	498	25176	22.	7629	10	503	15	207	
			01	.727	3.831	4680	.207	085.833	527.663	258.414	3451	
711.	*±8.90*	16.0	274.2	349	211	24.	5	7729.	422	11	2	

00			35	.344	039.635	5785	936.417	765	079.270	872.834	233 672
		20.0	340.8	434	259	24.	7	9	518701	14	2
			21	.167	350.641	4408	295.376	552.286	.282	590.753	233 672
		25.0	422.9	538	317	24.	8927	1177	634714	17	2
			44	.782	357.144	2 699	.064	0.108	.289	854.129	233 672
		30.0	503.8	641	37278	24.	10	13	745	20	2
			34	.826	9.874	1 003	486.353	921.830	579.749	972.707	233 672
813.	*±10.10*	16.0	314.4	400	31822	28.	7828	10	636	15	255
00			83	.615	1.456	1 839	.326	164.709	442.912	656.652	4115
		20.0	391.1	498	391	28.	9641	12	783	19	2
			31	.256	908.999	0 457	.057	579.646	817.998	282.115	554 115
		25.0	485.8	618	48085	27.	11	15	961712	23	2
			31	.893	6.057	8740	829.177	528.808	.115	658.354	554 115
		30.0	579.2	737	56637	27.	13	18	113274	27	2
			98	.959	3.762	7035	932.933	401.670	7.525	865.867	554 115

Table 3 Dimensions, permissible deviations, theoretical weight, cross-sectional area, and section properties of round steel sections (continued)

Nominal outside diameter mm	Permissible deviation mm	Nominal wall thickness mm	Theoretical weight per unit length kg/m	Cross-sectional area cm^2	Moment of inertia cm^4	Radius of gyration cm	Elastic modulus cm^3	Plastic modulus cm^3	Torsional constant cm^4	Torsional modulus cm^3	Surface area per meter mm^2/m
D	$\pm\Delta$	t	M	A	I	R	Z	S	J	C	A_s
914.00	±11.40	16.0	354.36	451.383	455141.420	31.7 541	9959.330	12903.829	910282.840	1991 8.661	2871416
		20.0	440.947	561.716	561460.711	31.6 156	1228 5.792	15987.386	112292 1.422	24571.584	2871416
		25.0	548.101	698.218	690316.291	31.4 433	15105.389	19763.233	138063 2.582	30210.778	2871416
		30.0	654.022	833.149	814774.552	31.2 721	1782 8.764	23452.680	162954 9.104	35657.529	2871

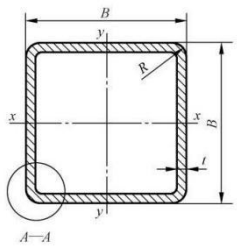
											416
1 067.00	±13.33	16.0	414.707	528.289	729 605.819	37.1628	13 675.835	1767 4.981	1459 211.638	2735 1.670	3 352 079
		20.0	516.411	657.848	901753 .843	37.0238	16 902.602	21 926.846	180350 7.687	33 805.205	3 352 079
		25.0	642.431	818.384	1 111 354.484	36.8 509	20 831.386	27 149.308	222270 8.968	41 662.773	3 352 079
		30.0	767.218	977.348	131486 2.566	36.6 788	24 645.971	32 270.070	262972 5.133	49 291.942	3 352 079
111 8.00	±13.90	16.0	434.831	553.925	841 038.401	38.9 657	15 045.409	19 431.829	168207 6.803	3009 0.819	35 12301
		20.0	541.566	689.893	104001 7.394	38.8 266	18 604.962	24 114.746	208003 4.788	37 209.924	*3 512*
		25.0	673.8	858.	128258	38.	22	29	2 565	45	*3 512*

			75	439	7.970	6 535	944.328	871.433	175.940	888.657	
		30.0	804.9	1025	151843	38.	27	35	3 036	54	35
			50	.415	9.624	4 812	163.499	521.320	879.247	326.999	12301
1	±15.2	16.0	474.6	604.	109409	42.	17	23	218818	35	38
219.00	0		84	693	0.382	5362	950.621	156.709	0.763	901.243	29601
		20.0	591.3	753.	135415	42.	22	28	270830	44	38
			82	353	3.466	3969	217.448	754.686	6.932	434.896	29601
		25.0	736.1	937.	1 671	42.	27	35	3 343	5486	38
			45	764	871.372	2 235	430.211	646.108	742.744	0.422	29601
		30.0	879.6	1120	1981	42.	32	42	396307	65	38
			75	.605	539.478	0 509	510.902	420.630	8.955	021.804	29601

Note 1: r is a calculated value $R - t$, not a measured value. Note 2: Identify individual items for specific drug information and take self-

Note 2: For nominal outside diameters, values in parentheses are for Series 1, and values outside parentheses (or without parentheses) are for Series 2.

6.1.1.6 The external corner radius R (or C_1、C_2) of closed steel sections shall comply with the provisions of Table 4. The measurement method for R (or C_1、C_2) shall be as specified in Figure 4 or by using a radius gauge; in case of dispute, the external corner radius R shall prevail. Upon agreement between the supplier and the purchaser and specified in the contract, requirements for the consistency of the external corner radius may be stipulated.



$A-A$

$A-A$ Enlarged

Key to symbols:

B —— side length;

t —— wall thickness;

R —— external corner radius;

C_1、C_2 — length of the corner region.

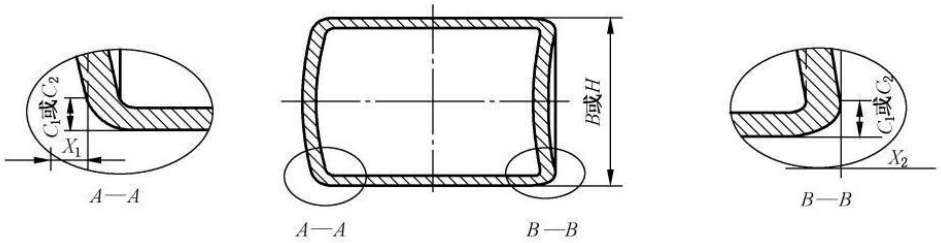
Figure 4 External corner profile of square or rectangular cold-formed closed steel sections

Table 4 External corner radius **R** (or $\mathbf{C}_1$、$\mathbf{C}_2$) values

Nominal thickness t /mm	Carbon steel ($R_{eH} \leq$ *320*MPa)	Low-alloy steel ($R_{eH} >$ *320*MPa)
$t \leq 3$	(1.0~2.5)t	(1.5~2.5) t
$3 < t \leq 6$	(1.5~2.5)t	(2.0~3.0)t
$6 < t \leq 10$	$(2.0 \sim 3.0)t$	(2.0~3.5)t
$t > 10$	(2.0~3.5)t	(2.5~4.0)t

Note: R_{eH} is the upper yield strength.

6.1.1.7 The convexity/concavity of the flat portion of the section steel X_1 , X_2 shall not exceed 0.6% of the side length, with a minimum value of *0.4* mm . The measurement method is shown in Figure 5.



$A \rightarrow A$ Enlarged $B \rightarrow B$ Enlarged

Key to symbols:

C_1、C_2 — length of the corner region;

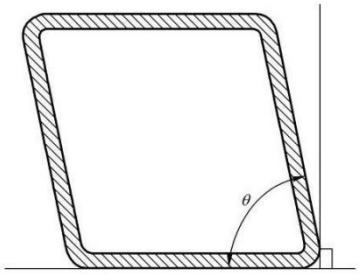
X_1、X_2 — convexity/concavity of the flat portion;

B — side length (for square section steel);

H — long side length (for rectangular section steel).

Figure 5 Schematic diagram of convexity/concavity of square or rectangular section steel

6.1.1.8 The deviation of the corner angle θ of the section steel shall not be greater than $\pm$ *1.5*° ; see Figure 6 for the measurement method.



Key to symbols:

θ — corner angle.

Figure 6 Corner angle

6.1.1.9 The measurement positions for section steel dimensions shall comply with the provisions of Table 5 or Table 6.

Table 5 Measurement positions for square or rectangular section steel

Dimensions in millimeters

Nominal side length of square or rectangular steel section	Measuring position distance from the end, not less than
$H(B) \leq 100$	200
$100 < H(B) \leq 300$	300
$300 < H(B) \leq 500$	400
$H(B) > 500$	Agreement

Note: H is the long side length of rectangular steel section; B is the side length of square steel section.

Table 6 Measurement positions for circular steel sections
Dimensions in millimeters

Nominal outside diameter of circular steel section D	Measurement position from end, not less than
$D \leq 114$	100
$114 < D \leq 273$	200
$273 < D \leq 508$	400
$D > 508$	Agreement

6.1.2 Open-section steel

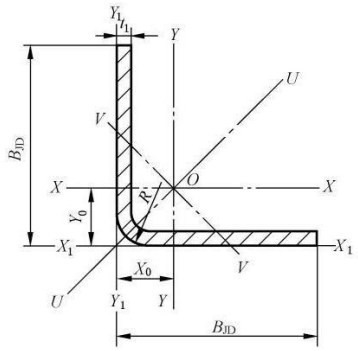
6.1.2.1 Cross-sectional shapes and designation symbols

The cross-sectional shapes and designation symbols for open-section steel are shown in Figures 7 to 15. Subject to agreement between the supplier and the purchaser and specified in the contract, steel sections other than those listed in Figures 7 to 15 may be supplied.

6.1.2.2 Dimensions, theoretical weight, cross-sectional area, and section properties

The dimensions, theoretical weight, cross-sectional area, and main parameters of open-section steel are shown in Tables 7 to 15. The cross-sectional area and section property parameters are for reference only.

Subject to agreement between the supplier and the purchaser and specified in the contract, steel sections with dimensions other than those listed in Tables 7 to 15 may be supplied, with parameters determined by mutual agreement.



Explanation of symbols:

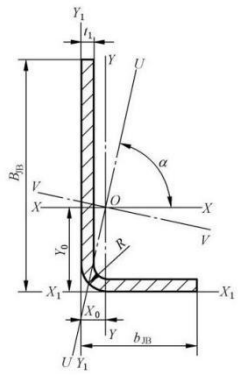
B_{JD} — width of equal angle leg;

t_1 — — leg thickness;

R — external fillet radius;

O — center of gravity origin.

Figure 7 Cold-formed equal angle steel (JD)



Explanation of symbols:

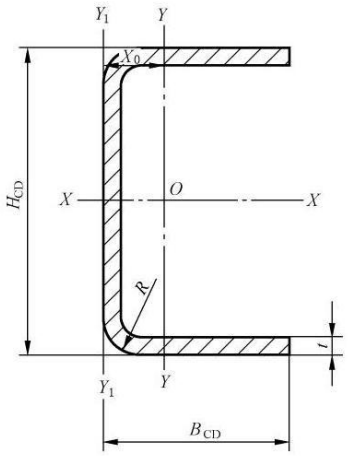
B_{JB} — width of long leg of unequal angle;

b_{JB} — width of short leg of unequal angle;

t_1 — leg thickness;

R —— outer arc radius.

Fig. 8 Cold-formed unequal angle steel (JB)



Explanation of symbols:

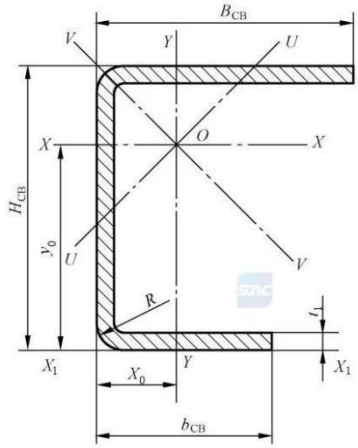
B_{CD} —— flange width of equal channel steel;

H_{CD} —— height of equal channel steel;

+ —— thickness of flange;

R —— outer arc radius.

Fig. 9 Cold-formed equal channel steel (CD)



Explanation of symbols:

B_{CB} —— width of long flange of unequal channel steel;

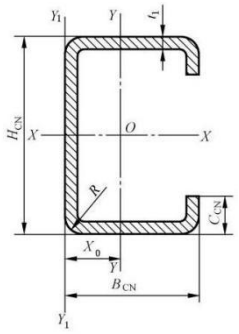
b_{CB} —— width of short flange of unequal channel steel (free flange);

H_{CB} —— height of unequal channel steel;

t_1 —— thickness of flange;

R —— outer arc radius.

Fig. 10 Cold-formed unequal channel steel (CB)



Explanation of symbols:

B_{CN} — width of the lipped channel steel flange;

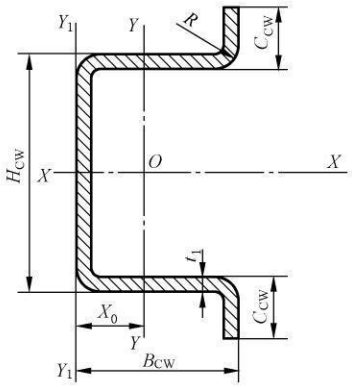
H_{CN} — height of the lipped channel steel;

C_{CN} — height of the inner lip of the lipped channel steel (free edge);

t_1 — thickness of the flange;

R — outer arc radius.

Figure 11 Cold-formed lipped channel steel (CN)



Explanation of symbols:

B_{CW} — width of the outer-lipped channel steel flange;

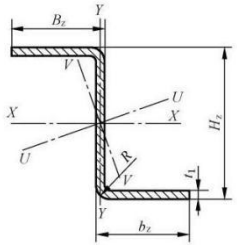
H_{CW} — height of the outer-lipped channel steel;

C_{CW} — height of the outer lip of the outer-lipped channel steel (free edge);

t_1 — thickness of the flange;

R — outer lip arc radius.

Figure 12 Cold-formed outer-lipped channel steel (CW)



Explanation of symbols:

B_Z =– Z — width of the upper flange of the section steel;

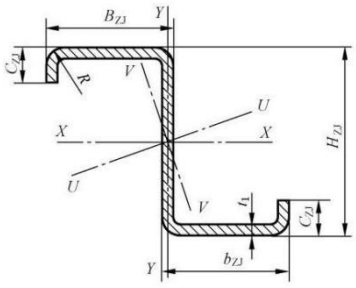
b_Z – Z — width of the lower flange of the section steel (free edge)

H_Z — Z-section height;

t_1 – flange thickness;

R — outer arc radius.

Fig. 13 Cold-formed **Z** section (**Z**)



Key to symbols:

B_{ZJ} — lipped Z section flange width;

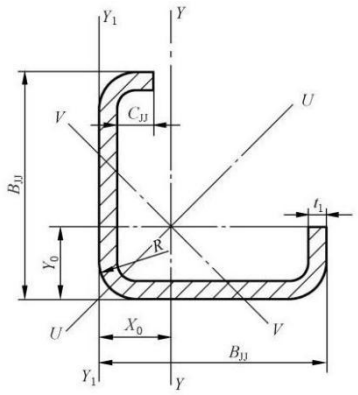
H_{ZJ} — lipped Z section height;

C_{ZJ} — lipped Z section lip height (free edge);

t_1 – — flange thickness;

R — outer arc radius.

Fig. 14 Cold-formed lipped Z section (ZJ



Key to symbols:

B_{JJ} — lipped equal angle section flange width;

C_{JJ} — lipped equal angle section lip height (free edge);

t_1 — flange thickness;

R — outer arc radius.

Fig. 15 Lipped equal angle steel (JJ)

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Table 7 Basic dimensions and section properties of cold-formed equal angle steel

Specification $B_{JD} \times B_{JD} \times t_1$	Dimensions mm B_{JD}	t_1	Theoretical weight kg/m	Sectional area cm^2	Center of gravity Y_0 cm	Moment of inertia cm^4 $I_x = I_y$	I_u	I_v	Radius of gyration cm $r_x = r_y$	r_u	r_v	Section modulus cm^3 $W_{ymax} = W_{xmax}$	$W_{ymin} = W_{xmin}$
20 × 20 × 1.2	20	1.2	0.354	0.451	0.559	0.179	0.292	0.066	0.630	0.804	0.385	0.321	0.124
20 × 20 × 2.0		2.0	0.566	0.721	0.599	0.278	0.457	0.099	0.621	0.796	0.371	0.464	0.198
30 × 30 × 2.0	30	1.6	0.714	0.909	0.829	0.817	1.328	0.307	0.948	1.208	0.581	0.986	0.376
30 × 30 × 2.0		2.0	0.880	1.121	0.849	0.998	1.626	0.369	0.943	1.204	0.573	1.175	0.464
30 × 30 × 3.0		3.0	1.274	1.623	0.898	1.409	2.316	0.503	0.931	1.194	0.556	1.568	0.671
40 × 40 × 1.6	40	1.6	0.965	1.229	1.079	1.985	3.213	0.758	1.270	1.616	0.785	1.839	0.679

40 × 40 × 2.0		2.0	1.194	1.521	1.0 99	2.4 38	3.9 56	0. 919	1. 265	1. 612	0. 777	2.2 18	0. 840
40 × 40 × 2.5		2.5	1.470	1.870	1.1 32	2.9 60	4.8 50	1. 070	1. 260	1. 610	0. 760	2.6 20	1. 030
40 × 40 × 3.0		3.0	1.745	2.223	1.1 48	3.4 96	5.7 10	1. 282	1. 253	1. 602	0. 759	3.0 43	1. 226
50 × 50 × 2.0	50	2.0	1.508	1.921	1.3 49	4.8 48	7.8 45	1. 850	1. 588	2. 020	0. 981	3.5 93	1. 327
50 × 50 × 2.5		2.5	1.860	2.370	1.3 81	5.9 30	9.6 50	2. 200	1. 580	2. 020	0. 960	4.2 90	1. 640
50 × 50 × 3.0		3.0	2.216	2.823	1.3 98	7.0 15	11. 414	2. 616	1. 576	2. 010	0. 962	5.0 15	1. 948
50 × 50 × 4.0		4.0	2.894	3.686	1.4 48	9.0 22	14. 755	3. 290	1. 564	2. 000	0. 944	6.2 29	2. 540
60 × 60 × 2.0	60	2.0	1.822	2.321	1.5 99	8.4 78	13. 694	3. 262	1. 910	2. 428	1. 185	5.3 02	1. 926

60 × 60 × 2.5		2.5	2.250	2.870	1.630	10.410	16.90	3.910	1.900	2.430	1.170	6.380	2.380
60 × 60 × 3.0		3.0	2.687	3.423	1.648	12.342	20.028	4.657	1.898	2.418	1.166	7.486	2.836
60 × 60 × 4.0		4.0	3.522	4.486	1.698	15.970	26.030	5.911	1.886	2.408	1.147	9.403	3.712
70 × 70 × 3.0	70	3.0	3.158	4.023	1.898	19.853	32.152	7.553	2.221	2.826	1.370	10.456	3.891
70 × 70 × 4.0		4.0	4.150	5.286	1.948	25.799	41.944	9.654	2.209	2.816	1.351	13.242	5.107
75 × 75 × 2.5	75	2.5	2.840	3.620	2.005	20.650	33.430	7.870	2.390	3.040	1.480	10.300	3.760
75 × 75 × 3.0		3.0	3.390	4.310	2.031	24.470	39.700	9.230	2.380	3.030	1.460	12.050	4.470

Table 7 Basic dimensions and section properties of cold-formed equal angles (continued)

Specification	Dimensions mm	Theoretical	Sectional area	Center of	Moment of inertia cm^4			Radius of gyration cm			Section modulus cm^3	

$B_{JD} \times B_{JD} \times t_1$	B_{JD}	t_1	weight kg/m	cm^2	gravity Y_0 cm	$I_x = I_y$	I_u	I_v	$r_x = r_y$	r_u	r_v	$W_{ymax} = W_{xmax}$	$W_{ymin} = W_{xmin}$
80 × 80 × 4.0	80	4.0	4.778	6.086	2.198	39.009	63.299	14.719	2.531	3.24	1.555	17.745	6.723
80 × 80 × 5.0		5.0	5.895	7.510	2.247	47.677	77.622	17.731	2.519	3.214	1.536	21.209	8.288
100 × 100 × 4.0	100	4.0	6.034	7.686	2.698	77.571	125.528	29.613	3.176	4.041	1.962	28.749	10.623
100 × 100 × 5.0		5.0	7.465	9.510	2.747	95.237	154.539	35.335	3.164	4.031	1.943	34.659	13.132
150 × 150 × 6.0	150	6.0	13.458	17.254	4.062	391.442	635.468	147.415	4.763	6.069	2.923	96.367	35.787
150 × 150 × 8.0		8.0	17.685	22.673	4.169	508.593	830.207	186.979	4.736	6.051	2.872	121.994	46.957
150 × 150 × 10		10	21.783	27.927	4.277	619.211	101 6.638	221.785	4.709	6.034	2.818	144.777	57.746

200 × 200 × 6.0	200	6.0	18.138	23.254	5.310	945.753	152 9.328	362.177	6.377	8.110	3.947	178 .108	64.381
200 × 200 × 8.0		8.0	23.925	30.673	5.416	1 237.149	200 8.393	465.905	6.351	8.091	3.897	228 .425	84.829
200 × 200 × 10		10	29.583	37.927	5.522	151 6.787	247 2.471	561.104	6.324	8.074	3.846	274 .681	104 .765
250 × 250 × 8.0	250	8.0	30.164	38.672	6.664	2 453.559	397 0.580	936.538	7.965	10.133	4.921	368 .181	133 .811
250 × 250 × 10		10	37.383	47.927	6.770	3 020.384	490 3.304	113 7.464	7.939	10.114	4.872	446 .142	165 .682
250 × 250 × 12		12	44.472	57.015	6.876	3 568.836	5 812.612	1 325.061	7.912	10.097	4.821	519 .028	196 .912
300 × 300 × 10	300	10	45.183	57.927	8.018	528 6.252	855 9.138	201 3.367	9.553	12.155	5.896	659 .298	240 .481
300 × 300 × 12		12	53.832	69.015	8.124	6 263.069	10 167.49	2 358.645	9.526	12.138	5.846	770 .934	286 .299

300 × 300 × 14	14	62.02	79.5	8.	718	11	2	9.	12.	5.	867	330
		2	16	277	2.256	740.00	624.502	504	150	745	.737	.629
300 × 300 × 16	16	70.31	90.1	8.	809	13	291	9.	12.	5.	964	374
		2	44	392	5.516	279.70	1.336	477	137	683	.671	.654

Table 8 Basic dimensions and section properties of cold-formed unequal angle steel

Specification	Dimensions mm			Theoretical weight kg/m	Section al area cm^2	Center of gravity cm		Moment of inertia cm^4				Radius of gyration cm				Section modulus cm^3			
$B_{JB} \times b_{JB} \times t_1$	B_{JB}	b_{JB}	t_1			Y_0	X_0	I_x	I_y	I_u	I_v	r_x	r_y	r_u	r_v	W_{xmax}	W_{xmin}	W_{ymax}	W_{ymin}
30 × 20 × 2.0	30	20	2.0	0.723	0.921	1.011	0.490	0.860	0.318	0.014	0.164	0.966	0.587	0.049	0.421	0.850	0.432	0.648	0.210
30 × 20 × 3.0			3.0	1.039	1.323	1.068	0.536	1.201	0.441	0.421	0.220	0.952	0.577	0.036	0.408	1.123	0.621	0.823	0.301
50 × 30 × 2.5	50	30	2.5	1.473	1.877	1.706	0.674	4.962	1.419	5.597	0.783	1.625	0.869	1.726	0.645	2.907	1.506	2.103	0.610

50 × 30 × 4.0			4.0	2.266	2.886	1.794	0.741	7.419	2.104	8.395	1.128	1.603	0.853	1.705	0.625	4.134	2.314	2.838	0.931
60 × 40 × 2.5	60	40	2.5	1.866	2.377	1.939	0.913	9.078	3.376	10.665	1.790	1.954	1.191	2.117	0.867	4.682	2.235	3.694	1.094
60 × 40 × 4.0			4.0	2.894	3.686	2.023	0.981	13.774	5.091	16.239	2.625	2.932	1.175	2.098	0.843	6.807	3.463	5.184	1.686
70 × 40 × 3.0	70	40	3.0	2.452	3.123	2.402	0.861	16.301	6.142	18.092	3.351	3.284	1.151	2.406	0.867	6.785	3.545	5.810	1.319
70 × 40 × 4.0			4.0	3.208	4.086	2.461	0.905	21.038	8.317	23.381	4.973	4.268	1.140	2.391	0.853	8.546	4.635	7.872	1.718
80 × 50 × 3.0	80	50	3.0	2.923	3.723	2.631	1.096	15.450	6.086	19.092	3.444	3.614	1.473	2.795	1.092	8.670	4.740	7.371	2.071
80 × 50 × 4.0			4.0	3.836	4.886	3.688	1.141	23.025	9.449	27.810	5.664	5.599	1.462	3.781	1.076	11.281	6.218	9.151	2.708
100 × 60 × 3.0	100	60	3.0	3.629	4.623	3.297	1.259	19.787	8.347	26.038	4.096	5.281	1.761	3.481	1.323	10.100	5.427	11.389	2.026

100 × 60 × 4.0			4.0	4.778	6.086	3.354	1.304	6.939	1.640	7.177	1.402	3.266	1.749	3.467	1.307	1.356	9.772	1.289	3.969
100 × 60 × 5.0			5.0	5.895	7.510	3.412	1.349	7.395	2.707	8.566	1.536	3.251	1.738	3.453	1.291	2.263	1.053	1.830	4.882
150 × 120 × 6.0	150	120	6.0	12.054	1.454	4.500	2.962	3.949	2.071	4.645	9.375	4.846	3.696	5.548	2.532	8.655	3.567	7.260	2.354
150 × 120 × 8.0			8.0	15.813	2.273	4.615	3.064	4.343	2.737	6.416	1.603	4.817	3.670	5.528	2.473	1.916	4.291	8.124	3.559
150 × 120 × 10			10	19.443	2.927	4.732	3.167	5.010	3.066	7.971	1.105	4.786	3.644	5.507	2.421	1.670	5.611	1.536	3.481
200 × 160 × 10			10	24.463	3.927	6.115	4.051	403.661	15.267	846.212	72.716	6.432	4.902	7.377	3.314	2.544	1.092	2.251	6.229

Table 8 Basic dimensions and section properties of cold-formed unequal angle steel (cont.)

Specification	Dimensions mm			Theoretical weight kg/m	Sectional area cm^2	Center of gravity cm		Moment of inertia cm^4				Radius of gyration cm				Section modulus cm^3			
$B_{JB} \times b_{JB} \times t_1$	B_{JB}	b_{JB}	t_1			Y_0	X_0	I_x	I_y	I_u	I_v	r_x	r_y	r_u	r_v	W_{xmax}	W_{xmin}	W_{ymax}	W_{ymin}
150 × 120 × 6.0	150	120	6.0	12.054	15.454	4.500	2.962	362.949	111.071	475.645	98.375	4.846	2.696	5.548	2.532	80.655	34.567	71.260	23.354
150 × 120 × 8.0			8.0	15.813	20.273	4.615	3.064	470.343	173.077	619.416	124.003	4.817	2.670	5.528	2.473	101.916	45.291	89.124	30.559
150 × 120 × 10			10	19.443	24.927	4.732	3.167	571.010	231.066	755.971	146.105	4.786	2.644	5.507	2.421	120.670	55.611	104.536	37.481
200 × 160 × 8.0	200	160	8.0	21.429	27.473	6.000	3.950	1147.099	367.089	1503.275	310.914	6.462	4.928	7.397	3.364	191.183	81.936	168.883	55.360

200 × 160 × 10			10	24.463	3 3.927	6 .115	4 .051	1 403.661	8 15.267	1 846.212	3 72.716	6 .432	4 .902	7 .377	3 .314	2 29.544	1 01.092	2 01.251	6 8.229
200 × 160 × 12			12	31.368	4 0.215	6 .231	4 .154	1 648.244	9 56.261	2 176.288	4 28.217	6 .402	4 .876	7 .356	3 .263	2 64.523	1 19.707	2 30.202	8 0.724
250 × 220 × 10	25 0	22 0	10	35.043	4 4.927	7 .188	5 .652	2 894.335	2 122.346	4 102.990	9 13.691	8 .026	6 .873	9 .556	4 .510	4 02.662	1 62.494	3 75.504	1 29.823
250 × 220 × 12			12	41.664	5 3.415	7 .299	5 .756	3 417.040	2 504.222	4 859.116	1 062.097	7 .998	6 .847	9 .538	4 .459	4 68.151	1 93.042	4 35.063	1 54.163
250 × 220 × 14			14	47.826	6 1.316	7 .466	5 .904	3 895.841	2 856.311	5 590.119	1 162.033	7 .971	6 .825	9 .548	4 .353	5 21.811	2 22.188	4 83.793	1 77.455

300 × 260 × 12	300	260	12	50.088	6	4.215	8	.686	6	.638	5	970.485	4	218.566	8	347.648	1	841.403	9	.642
	8	.105	1	1.402	5	.355	6	87.369	2	80.120	6	35.517	2	17.879						
300 × 260 × 14			14	57.654	7	3.916	8	.851	6	.782	6	835.520	4	831.275	9	625.709	2	041.085	9	.616
	8	.085	1	1.412	5	.255	7	72.288	3	23.208	7	12.367	2	51.393						
300 × 260 × 16			16	65.320	8	3.744	8	.972	6	.894	7	697.062	5	438.329	1	876.951	2	258.440	9	.587
	8	.059	1	1.397	5	.193	8	57.898	3	66.039	7	88.850	2	84.640						

H

Table 9 Basic dimensions and section parameters of cold-formed equal channel steel

Specification	Dimensions mm			Theoretical weight kg/m	Sectional area cm^2	Center of gravity X_0 cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CD} \times B_{CD} \times t_1$	H_{CD}	B_{CD}	t_1				I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}

20 × 10 × 1.5	20	10	1.5	0.401	0.511	0.324	0.28	0.047	0.7	0.305	0.281	0.146	0.070
20 × 10 × 2.0			2.0	0.505	0.643	0.349	0.330	0.058	0.716	0.300	0.330	0.165	0.089
50 × 30 × 3.0	50	30	2.0	1.604	2.043	0.922	8.093	1.872	1.990	0.957	3.237	2.029	0.901
50 × 30 × 3.0			3.0	2.314	2.947	0.975	11.19	2.632	1.942	0.994	4.447	2.699	1.299
50 × 50 × 3.0		50	3.0	3.256	4.147	1.850	17.755	10.834	2.069	1.616	7.102	5.855	3.440
60 × 30 × 2.5	60	30	2.5	2.150	2.740	0.883	14.380	2.400	2.310	0.940	4.890	2.710	1.130
80 × 40 × 2.5	80	40	2.5	2.940	3.740	1.132	36.700	5.920	3.130	1.260	9.180	5.230	2.060
80 × 40 × 3.0			3.0	3.480	4.340	1.159	42.660	6.930	3.100	1.250	10.670	5.980	2.440

100 × 40 × 3.0	100	40	2.5	3.330	4.240	1.013	62.070	6.370	3.830	1.230	12.410	6.290	2.130
100 × 40 × 3.0			3.0	3.950	5.030	1.039	72.440	7.470	3.800	1.220	14.490	7.190	2.520
100 × 50 × 3.0	100	50	3.0	4.433	5.647	1.398	87.275	14.030	3.931	1.576	17.455	10.031	3.896
100 × 50 × 4.0			4.0	5.788	7.373	1.448	111.051	18.045	3.880	1.564	22.210	12.458	5.081
120 × 40 × 2.5	120	40	2.5	3.720	4.740	0.919	95.920	6.720	4.500	1.190	15.990	7.320	2.180
120 × 40 × 3.0			3.0	4.420	5.630	0.944	112.280	7.900	4.470	1.190	18.710	8.370	2.580
140 × 50 × 3.0	140	50	3.0	5.360	6.830	1.187	191.530	15.520	5.300	1.510	27.360	13.080	4.070
140 × 50 × 3.5			3.5	6.200	7.890	1.211	218.880	17.790	5.270	1.500	31.270	14.690	4.700

140 × 60 × 3.0	140	60	3.0	5.846	7.447	1.527	220.977	25.929	5.447	1.865	31.568	16.970	5.798
140 × 60 × 4.0			4.0	7.672	9.773	1.575	284.429	33.601	5.394	1.854	40.632	21.324	7.594
140 × 60 × 5.0			5.0	9.436	12.021	1.623	343.066	40.823	5.342	1.842	49.009	25.145	9.327
160 × 60 × 3.0	160	60	3.0	6.300	8.030	1.432	300.870	26.900	6.120	1.830	37.610	18.790	5.890
160 × 60 × 3.5			3.5	7.200	9.290	1.456	344.940	30.920	6.090	1.820	43.120	21.230	6.810
200 × 80 × 4.0	200	80	4.0	10.812	13.773	1.966	821.120	83.686	7.721	2.464	82.112	42.564	13.869

Table 9 Basic dimensions and section properties of cold-formed equal channel steel (continued)

Specification	Dimensions mm			Theoretical weight kg/m	Sectional area cm^2	Center of gravity X_0 cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CD} \times B_{CD} \times t_1$	H_{CD}	B_{CD}	t_1				I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}

200 × 80 × 5.0	200	80	5.0	13.36	17.021	2.013	1000.710	102.441	7.667	2.453	100.071	50.886	17.111
200 × 80 × 6.0			6.0	15.84	20.190	2.060	1 170.516	120.388	7.614	2.441	117.051	58.436	20.267
250 × 130 × 6.0	250	130	6.0	22.70	29.107	3.630	2876.401	497.071	9.941	4.132	230.112	136.934	53.049
250 × 130 × 8.0			8.0	29.75	38.147	3.739	3 687.729	642.760	9.832	4.105	295.018	171.907	69.405
300 × 150 × 6.0	300	150	6.0	26.91	34.507	4.062	4 911.518	782.884	11.930	4.763	327.435	192.734	71.575
300 × 150 × 8.0			8.0	35.37	45.347	4.169	6337.148	1 017.186	11.822	4.736	422.477	243.988	93.914
300 × 150 × 10			10	43.56	55.854	4.277	7 660.498	1 238.423	11.711	4.708	510.700	289.554	115.492
350 × 180 × 8.0	350	180	8.0	42.23	54.147	4.983	10 488.540	1 771.765	13.918	5.721	599.345	355.562	136.112

350 × 180 × 10			10	1	52.14	66.8	5.0	12	2	13.749.074	5.166.713	728.809	425.693	167.858
350 × 180 × 12			12	1	61.79	79.2	5.5	14	2	13.869.892	5.542.823	849.700	462.665	203.442
400 × 200 × 10	400	200	10	1	59.16	75.8	5.5	18	3	15.932.658	6.033.575	946.799	549.324	209.530
400 × 200 × 12			12	1	70.22	90.0	5.6	22	3	15.159.727	6.569.548	1107.986	634.689	248.403
400 × 200 × 14			14	1	80.36	103.033	5.7	24	4	15.854.034	6.051.828	1242.702	699.531	285.159
450 × 220 × 10	450	220	10	1	66.18	84.8	5.9	26	4	17.844.416	6.103.714	1193.085	689.787	255.005	.779
450 × 220 × 12			12	1	78.64	100.830	6.0	31	4	17.506.135	6.838.741	1400.273	798.676	303.927	.617
450 × 220 × 14			14	1	90.19	115.633	6.2	35	5	17.494.843	6.510.415	1577.549	886.520	349.061	.180

500×250×12	500	250	12	88.943	114.030	6.876	44593.265	7137.673	19.775	7.912	1783.731	1038.056	393.824
500×250×14			14	102.206	131.033	7.032	50455.689	8152.938	19.623	7.888	2018.228	1159.405	453.748
550×280×12	550	280	12	99.239	127.230	7.691	60862.568	10068.396	21.872	8.896	2213.184	1309.114	495.760
550×280×14			14	114.218	146.433	7.846	69095.642	11527.579	21.722	8.873	2512.569	1469.230	571.975
600×300×16	600	300	14	124.046	159.033	8.276	89412.972	14364.512	23.711	9.504	2980.432	1735.683	661.228
600×300×16			16	140.624	180.287	8.392	100367.430	16191.032	23.595	9.477	3345.581	1929.341	749.307

Table 10 Basic dimensions and section parameters of cold-formed unequal channel steel

Specification	Dimensions mm			Theoreti	Section	Center of gravity cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		

H_{CB} $\times B_{CB}$ $\times b_{CB}$ $\times t_1$	H_{CB}	B_{CB}	b_{CB}	t_1	cal weight kg/m	al area cm^2	X_0	Y_0	I_x	I_y	I_u	I_v	r_x	r_y	r_u	r_v	W_{xmax}	W_{xmin}	W_{ymax}	W_{ymin}
50 × 32 × 20 × 2.5	50	32	20	2.5	1.840	2.344	.817	2.803	8.536	1.853	8.769	1.619	1.908	.889	1.934	.831	3.887	3.044	2.266	0.777
50 × 32 × 20 × 3.0				3.0	2.169	2.764	.842	2.806	9.804	2.155	1 0.083	1.876	1.883	.883	1.909	.823	4.468	3.494	2.559	0.914
80 × 40 × 20 × 2.5	80	40	20	2.5	2.586	3.294	.828	4.588	2 8.922	3.775	2 9.607	3.090	2.962	.070	2.997	.968	8.476	6.303	4.555	1.190
80 × 40 × 20 × 3.0				3.0	3.064	3.904	.852	4.591	3 3.654	4.431	4 4.473	3.611	2.936	.065	2.971	.961	9.874	7.329	5.200	1.407
100 × 60 × 30 × 3.0	10 0	60	30	3.0	4.242	5.404	.326	5.807	7 7.936	1 4.880	8 0.845	1 1.970	3 .797	.659	3 .867	.488	1 8.590	1 3.419	1 1.220	3 .183
150 × 60 × 50 × 3.0	15 0		50		5.890	7.504	.304	7.793	2 45.876	2 1.452	2 46.257	2 1.071	5 .724	.690	5 .728	.675	3 4.120	3 1.547	1 6.440	4 .569

200 × 70 × 60 × 4.0	200	70	60	4.0	9.832	12.605	.469	10.311	106.995	74.735	107.582	74.149	.489	.946	.492	.934	72.969	58.567	24.956	3.630
200 × 70 × 60 × 5.0				5.0	12.061	15.463	.527	10.315	148.963	75.959	149.689	75.233	.410	.936	.413	.924	87.658	82.304	37.956	10.590
250 × 80 × 70 × 6.0	250	80	70	5.0	14.791	18.963	.647	12.823	1616.200	92.101	1617.030	91.271	.232	.204	.234	.194	132.726	126.039	75.920	14.497
250 × 80 × 70 × 6.0				6.0	17.555	22.507	.696	12.825	1891.478	108.125	1892.465	107.139	.167	.192	.170	.182	155.358	147.484	93.753	17.152
300 × 90 × 80 × 6.0	300	90	80	6.0	20.831	26.707	.822	15.330	2222.869	161.726	2223.981	160.613	0.985	.461	0.987	.452	219.691	210.233	158.763	22.531

300 × 90 × 80 × 8.0				8.0	2	3		1	4	2	4	2	1		1		2	2	1	2
					7.259	4.947	.918	5.33		07.55		06.11	0.85	.437	0.85	.429	80.63	68.41	08.21	9.30
								4	115.8	5	117.2	0	2		4		7	2	4	7
									25		70									
350 × 100 × 90 × 6.0	35	10	90	6.0	2	3		1	5	2	5	2	1		1		2	2	1	2
	0	0			4.107	0.907	.953	7.83		30.46		29.22	2.80	.731	2.80	.723	95.03	83.98	18.00	8.64
								4	064.5	3	065.7	6	1		2		1	0	5	0
									02		39									
350 × 100 × 90 × 8.0				8.0	3	4		1	6	2	6	2	1		1		3	3	1	3
					1.627	0.547	.048	7.83		97.08		95.46	2.66	.707	2.66	.699	79.09	64.77	45.06	7.35
								7	506.4	2	508.0	4	8		9		6	1	0	9
									23		41									
400 × 150 × 100 × 10	40	15	100	8.0	3	4		2	1	7	1	7	1		1		5	4	2	6
	0	0			8.491	9.347	.882	1.58	0	63.61	0	07.46	4.78	.934	4.82	.786	85.93	99.68	64.95	3.01
								9	787.7	0	843.8	3	6		4		8	5	8	5
									04		50									
400 × 150 × 100 × 10				0	4	6		2	1	9	1	8	1		1		7	6	3	7
					7.466	0.854	.981	1.60	3	31.17	3	61.25	4.65	.912	4.69	.762	10.48	05.10	12.36	7.47
								2	071.4	0	141.3	5	6		5		2	3	8	5

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44 58

Table 10 Basic dimensions and section properties of cold-formed unequal channel steel (cont.)

Specification	Dimensions mm				Theoretical weight kg/m	Sectional area cm^2	Center of gravity cm		Moment of inertia cm^4				Radius of gyration cm				Section modulus cm^3			
$H_{CB} \times B_{CB} \times b_{CB} \times t_1$	H_{CB}	B_{CB}	b_{CB}	t_1			X_0	Y_0	I_x	I_y	I_u	I_v	r_x	r_y	r_u	r_v	W_{xmax}	W_{xmin}	W_{ymax}	W_{ymin}
$450 \times 200 \times 150 \times 10$	450	200	150	10	59.166	75.854	4.402	23.950	2328.149	337.132	2430.862	2234.420	17.157	5.551	17.196	5.427	1060.720	932.282	530.925	149.835
$450 \times 200 \times 150 \times 12$				12	70.223	90.030	4.504	23.960	6133,270	750.039	6256.075	2627.235	17.037	5.527	17.077	5.402	1242.076	1090.704	610.577	177.468

500 × 250 × 200 × 12	500	250	200	12	84.263	108.030	1.008	6.355	0	821,990	57	0	985.44	5	415.752	1	9.439	7	.186	1	9.478	7	.080	1	726.453	1	548.928	9	28.630	2	93.766
500 × 250 × 200 × 14				14	96.746	124.033	1.159	6.371	6	087.83	36	6	277.56	6	179.346	1	9.276	7	.166	1	9.306	7	.058	1	950.478	1	747.671	1	034.107	3	38.043
550 × 300 × 250 × 14	550	300	250	14	113.126	145.033	1.714	8.794	7	847.21	1	8	086.25	1	075.308	1	1.629	2	.832	8	1.667	2	.739	8	588.995	2	356.297	2	466.729	1	07.689
550 × 300 × 250 × 16				16	128.144	164.287	1.831	8.800	6	016.86	2	6	288.34	2	467.503	1	1.511	2	.806	8	1.549	2	.711	8	901.407	2	639.474	2	626.738	1	74.631

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Table 11 Basic dimensions and section properties of cold-formed inwardly-lipped channel steel

Specification	Dimensions mm				Theoretical weight kg/m	Sectional area cm^2	Center of gravity cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CN} \times B_{CN} \times C_{CN} \times t_1$	H_{CN}	B_{CN}	C_{CN}	t_1			X_0	I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}
$60 \times 30 \times 10 \times 2.5$	60	30	10	2.5	2.363	3.010	1.043	16.009	3.353	2.306	1.055	5.336	3.214	1.713
$60 \times 30 \times 10 \times 3.0$				3.0	2.743	3.495	1.036	18.077	3.688	2.274	1.027	6.025	3.559	1.878
$80 \times 40 \times 15 \times 2.0$	80	40	15	2.0	2.720	3.470	1.452	34.160	7.790	3.140	1.500	8.540	5.360	3.060
$100 \times 50 \times 15 \times 2.5$	100	50	15	2.5	4.110	5.230	1.706	81.340	17.190	3.940	1.810	16.270	10.080	5.220
$100 \times 50 \times 20 \times 2.5$	100	50	20	2.5	4.325	5.510	1.853	84.932	19.889	3.925	1.899	16.986	10.730	6.321

100 × 50 × 20 × 3.0				3.0	5.098	6.495	1.848	98.560	22.802	3.895	1.873	19.712	12.333	7.235
120 × 50 × 20 × 2.5	120	50	20	2.5	4.700	5.980	1.706	129.400	20.960	4.560	1.870	21.570	12.280	6.360
120 × 60 × 20 × 3.0	120	60	20	3.0	6.010	7.650	2.106	170.680	37.360	4.720	2.210	28.450	17.740	9.590

Table 11 Basic dimensions and section properties of cold-formed inwardly-lipped channel steel (continued)

Specification	Dimensions mm				Theoretical weight kg/m	Sectional area cm^2	Center of gravity cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CN} \times B_{CN} \times C_{CN} \times t_1$	H_{CN}	B_{CN}	C_{CN}	t_1			X_0	I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}
120 × 60 × 20 × 3.0	120	60	20	3.0	6.010	7.650	2.106	170.680	37.360	4.720	2.210	28.450	17.740	9.590
140 × 50 × 20 × 2.0	140	50	20	2.0	4.140	5.270	1.590	154.030	18.560	5.410	1.880	22.000	11.680	5.440

140 × 60 × 20 × 2.5	140	50	20	2.5	5.090	6.480	1.580	186.780	22.110	5.390	1.850	26.680	13.960	6.470
140 × 60 × 20 × 2.5	140	60	20	2.5	5.503	7.010	1.974	212.137	34.786	5.500	2.227	30.305	17.615	8.642
140 × 60 × 20 × 3.0				3.0	6.511	8.295	1.969	248.006	40.132	5.467	2.199	35.429	20.379	9.956
160 × 60 × 20 × 2.0	160	60	20	2.0	4.760	6.070	1.850	236.590	29.990	6.240	2.220	29.570	16.190	7.230
160 × 60 × 20 × 2.5				2.5	5.870	7.480	1.850	288.130	35.960	6.210	2.190	36.020	19.470	8.660
160 × 70 × 20 × 3.0	160	70	20	3.0	7.420	9.450	2.224	373.640	60.420	6.290	2.530	46.710	27.170	12.650
180 × 60 × 20 × 3.0	180	60	20	3.0	7.453	9.495	1.739	449.695	43.611	6.881	2.143	49.966	25.073	10.235
180 × 70 × 20 × 3.0		70			7.924	10.095	2.106	496.693	63.712	7.014	2.512	55.188	30.248	13.019

180 × 70 × 20 × 2.0	180	70	20	2.0	5.390	6.870	2.10	343.930	45.180	7.080	2.570	38.210	21.370	9.250
180 × 70 × 20 × 2.5	180	70	20	2.5	6.660	9.480	2.10	420.200	54.420	7.040	2.530	46.690	25.820	11.120
200 × 60 × 20 × 3.0	200	60	20	3.0	7.924	10.095	1.64	578.425	45.041	7.569	2.112	57.842	27.382	10.342
200 × 70 × 20 × 2.0	200	70	20	2.0	5.710	7.270	2.00	440.040	46.710	7.780	2.540	44.000	23.320	9.350
200 × 70 × 20 × 2.5	200	70	20	2.5	7.050	8.980	2.00	538.210	56.270	7.740	2.500	53.820	28.180	11.250
200 × 70 × 20 × 3.0	200	70	20	3.0	8.395	10.695	1.96	636.643	65.883	7.715	2.481	63.664	32.999	13.167
220 × 75 × 20 × 2.0	220	75	20	2.0	6.180	7.870	2.08	574.450	56.880	8.540	2.690	52.220	27.350	10.500
220 × 75 × 20 × 2.5	220	75	20	2.5	7.640	9.730	2.07	703.760	68.660	8.500	2.660	63.980	33.110	12.650

Table 11 Basic dimensions and section properties of cold-formed inwardly-lipped channel steel (continued)

Specification	Dimensions mm				Theoretical weight kg/m	Cross-sectional area cm^2	Center of gravity cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CN} \times B_{CN} \times C_{CN} \times t_1$	H_{CN}	B_{CN}	C_{CN}	t_1			X_0	I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}
250 × 40 × 15 × 3.0	250	40	15	3.0	7.924	10.095	0.790	773.4 95	14.809	8.753	1.211	61.879	18.734	4.614
300 × 40 × 15 × 3.0	300	40			9.102	11.595	0.707	1 231.616	15.356	10.306	1.150	82.107	21.700	4.664
400 × 50 × 15 × 3.0	400	50			11.928	15.195	0.783	2 837.843	28.888	13.666	1.378	141.892	36.879	6.851
450 × 70 × 30 × 6.0	450	70	30	6.0	28.092	36.015	1.421	8796.963	159.703	15.629	2.106	390.976	112.388	28.626
450 × 70 × 30 × 8.0				8.0	36.421	46.693	1.429	11 030.645	182.734	15.370	1.978	490.251	127.875	32.801
500 × 100 × 40 × 6.0	500	100	40	6.0	34.176	43.815	2.297	14 275.246	479.809	18.050	3.309	571.010	208.885	62.289

500 × 100 × 40 × 8.0				8.0	44.53	57.	2.	18	578.	17.	3.	726.	252	75.
					3	093	293	150.796	026	830	182	032	.083	000
500 × 100 × 40 × 10				10	54.37	69.	2.	2159	648.	17.	3.	863.	283	84.
					2	708	289	4.366	778	601	051	775	.433	137
550 × 120 × 50 × 8.0	55	12	50	8.0	51.39	65.	2.	26	1	19.	4.	954.	363	118
	0	0			7	893	940	259.069	069.797	963	029	875	.877	.079
550 × 120 × 50 × 10				10	62.95	80.	2.	31	122	19.	3.	1	419	135
					2	708	933	484.498	9.103	751	902	144.891	.060	.558
550 × 120 × 50 × 12				12	73.99	94.	2.	36	1	19.	3.	1	461	148
					0	859	926	186.756	349.879	531	772	315.882	.339	.763
600 × 150 × 60 × 12	60	15	60	12	86.15	110	3.	54	2	21.	4.	1	706	248
	0	0			8	.459	902	745.539	755.348	852	994	824.851	.137	.274
600 × 150 × 60 × 14				14	97.39	124	3.	57	2	21.	4.	1	746	256
					5	.865	840	733.224	867.742	503	792	924.441	.808	.966
600 × 150 × 60 × 16				16	109.0	139	3.	6317	301	21.	4.	210	788	269
					25	.775	819	8.379	0.816	260	641	5.946	.378	.280

Table 12 Basic dimensions and section properties of cold-formed lipped channel steel

Specification	Dimensions mm				Theoretical weight kg/m	Sectional area cm^2	Center of gravity cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CW} \times B_{CW} \times C_{CW} \times t_1$	H_{cw}	B_{CW}	C_{CW}	t_1			X_0	I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}
30 × 30 × 16 × 2.5	30	30	16	2.5	2.009	2.560	1.526	6.010	3.126	1.532	1.105	2.109	2.047	2.122
50 × 20 × 15 × 3.0	50	20	15	3.0	2.272	2.895	0.823	13.863	1.539	2.188	0.729	3.746	1.869	1.309
60 × 25 × 32 × 2.5	60	25	32	2.5	3.030	3.860	1.279	42.431	3.959	3.315	1.012	7.131	3.095	3.243
60 × 25 × 32 × 3.0	60	25	32	3.0	3.544	4.515	1.279	49.003	4.438	3.294	0.991	8.305	3.469	3.635
80 × 40 × 20 × 4.0	80	40	20	4.0	5.296	6.746	1.573	79.594	14.537	3.434	1.467	14.213	9.241	5.900
100 × 30 × 15 × 3.0	100	30	15	3.0	3.921	4.995	0.932	77.669	5.575	3.943	1.056	12.527	5.979	2.696

150 × 40 × 20 × 4.0	150	40	20	4.0	7.497	9.61	1.	325.	18.	5.	1.	35.	15.	6.
						1	176	197	311	817	380	736	571	484
150 × 40 × 20 × 5.0				5.0	8.913	11.4	1.	370.	19.	5.	1.	41.	16.	6.
						27	158	697	357	696	302	189	716	811
200 × 50 × 30 × 4.0	200	50	30	4.0	10.30	13.2	1.	834.	44.	7.	1.	66.	29.	12
					5	11	525	155	255	946	830	203	020	.735
200 × 50 × 30 × 5.0				5.0	12.42	15.9	1.	976.	49.	7.	1.	78.	32.	10
					3	27	511	969	376	832	761	158	678	.999
250 × 60 × 40 × 5.0	250	60	40	5.0	15.93	20.4	1.	202	99.	9.	2.	12	53.	23
					3	27	856	9.828	403	968	206	6.864	558	.987
250 × 60 × 40 × 6.0				6.0	18.73	24.0	1.	234	11	9.	2.	14	59.	26
					2	15	853	2.687	1.005	877	150	7.339	906	.768
300 × 70 × 50 × 6.0	300	70	50	6.0	22.94	29.4	2.	4	19	12	2.	21	89.	41
					4	15	195	246.582	7.478	.015	591	8.896	967	.098
300 × 70 × 50 × 8.0				8.0	29.55	37.8	2.	530	23	11	2.	27	10	48
					7	93	191	4.784	3.118	.832	480	6.291	6.398	.475

350 × 80 × 60 × 6.0	350	80	60	6.0	27.156	34.815	2.533	973.923	9.329	14.153	3.029	4.538	6.068	58.410
350 × 80 × 60 × 8.0				8.0	35.173	45.093	2.475	804.763	5.038	13.973	2.845	7.875	7.490	66.070
400 × 90 × 70 × 8.0	400	90	70	8.0	40.789	52.293	2.773	577.846	8.603	16.114	3.239	8.238	7.837	88.101

Table 12 Basic dimensions and section properties of cold-formed lipped channel steel (cont.)

Specification	Dimensions mm				Theoretical weight kg/m	Sectional area cm^2	Center of gravity cm	Moment of inertia cm^4		Radius of gyration cm		Section modulus cm^3		
$H_{CW} \times B_{CW} \times C_{CW} \times t_1$	H_{cw}	B_{CW}	C_{CW}	t_1			X_0	I_x	I_y	r_x	r_y	W_x	W_{ymax}	W_{ymin}
400 × 90 × 70 × 10	400	90	70	10	49.692	63.708	2.868	16 171.507	672.619	15.932	3.249	621.981	234.525	109.690
450 × 100 × 80 × 8.0	450	100	80	8.0	46.405	59.493	3.206	19 821.232	855.920	18.253	3.793	667.382	266.974	125.982

450 × 100 × 80 × 10				10	56.712	72.708	3.205	23 751.957	987.987	18 .074	3. 686	805. 151	308. 264	145. 399
500 × 150 × 90 × 10	500	150	90	10	69.972	89.708	5.003	38 191.923	2907 .975	20 .633	5. 694	1 157.331	581. 246	290. 885
500 × 150 × 90 × 12				12	82.414	105. 659	4. 992	44 274.544	3291 .816	20 .470	5. 582	1 349.834	659. 418	328. 918
550 × 200 × 100 × 12	550	200	100	12	98.326	126. 059	6. 564	66 449.957	6 427.780	22 .959	7. 141	183 0.577	979. 247	478. 400
550 × 200 × 100 × 14				14	111.591	143. 065	6. 815	7408 0.384	7829 .699	22 .755	7. 398	205 2.088	114 8.892	593. 834
600 × 250 × 150 × 14	600	250	150	14	138.891	178. 065	9. 717	125 436.851	17 163.911	26 .541	9. 818	287 6.992	176 6.380	112 3.072
600 × 250 × 150 × 16				16	156.449	200. 575	9. 700	139 827.681	1887 9.946	26 .403	9. 702	322 1.836	194 6.386	1 233,983

Table 13 Basic dimensions and section properties of cold-formed **Z** steel

Specific	Dimensio	Theoret	Secti	Moment of inertia cm^4	Rad	Prod	Section

ation	ns mm			ical weight kg/m	onal area cm^2					ius of gyration cm	uct of inertia cm^4	modulus cm^3	
$H_Z \times B_Z \times t_1$	H_Z	B_Z	t_1			I_x	I_y	I_u	I_v	r_v	I_{xy}	W_x	W_y
80 × 40 × 2.5	80	40	2.5	2.947	3.755	37.021	9.707	43.307	3.421	0.954	14.532	9.255	2.505
80 × 40 × 3.0			3.0	3.491	4.447	43.148	11.429	50.606	3.970	0.944	17.094	10.787	2.968
100 × 50 × 2.5	100	50	2.5	3.732	4.755	74.429	19.321	86.840	6.910	1.205	28.947	14.885	3.963
100 × 50 × 3.0			3.0	4.433	5.647	87.275	22.837	102.038	8.073	1.195	34.194	17.455	4.708

Table 13 Basic dimensions and section properties of cold-formed **Z** steel (continued)

Specification	Dimensions mm			Theoretical weight kg/m	Sectional area cm^2	Moment of inertia cm^4				Radius of gyration cm	Product of inertia cm^4	Section modulus cm^3	

$H_Z \times B_Z \times t_1$	H_Z	B_Z	t_1			I_x	I_y	I_u	I_v	r_v	I_{xy}	W_x	W_y
140 × 70 × 3.0	140	70	3.0	6.291	8.065	249.769	64.316	290.867	23.218	1.697	96.492	35.681	9.389
140 × 70 × 4.0			4.0	8.272	10.605	322.421	83.925	376.599	29.747	1.675	125.922	46.061	12.342
200 × 100 × 3.0	200	100	3.0	9.099	11.665	749.379	191.180	870.468	70.091	2.451	286.800	74.938	19.409
200 × 100 × 4.0			4.0	12.016	15.405	977.164	251.093	1137 .292	90.965	2.430	376.703	97.716	25.622
300 × 120 × 4.0	300	120	4.0	16.384	21.005	2871 .420	438.304	3 124.579	185.144	2.969	824.655	191.428	37.144
300 × 120 × 5.0			5.0	20.251	25.963	3506 .942	541.080	3823 .534	224.489	2.940	1 019.410	233.796	46.049
400 × 150 × 6.0	400	150	6.0	31.595	40.507	9 598.705	1 271.376	10 321.169	548.912	3.681	2 556.980	479.935	86.488
400×150×8.0			8.0	41.611	53.347	12 449.116	1 661.661	13 404.115	706.662	3.640	3 348.736	622.456	113.812

Table 14 Basic dimensions and section properties of cold-formed curled **Z** steel

Specification	Dimensions mm				Theoretical weight kg/m	Sectional area cm^2	Moment of inertia cm^4				Radius of gyration cm	Product of inertia cm^4	Section modulus cm^3	
$H_{ZJ} \times B_{ZJ} \times C_{ZJ} \times t_1$	H_{ZJ}	B_{ZJ}	C_{ZJ}	t_1			I_x	I_y	I_u	I_v	r_v	I_{xy}	W_x	W_y
$100 \times 40 \times 20 \times 2.0$	100	40	20	2.0	3.208	4.086	60.618	17.202	71.373	6.448	1.256	24.136	12.123	4.410
$100 \times 40 \times 20 \times 2.5$				2.5	3.933	5.010	73.047	20.324	85.730	7.641	1.234	28.802	14.609	5.245
$120 \times 50 \times 20 \times 2.0$	120	50	20	2.0	3.820	4.870	106.970	30.230	126.060	11.140	1.510	42.770	17.830	6.170
$120 \times 50 \times 20 \times 2.5$				2.5	4.700	5.980	129.390	35.910	152.050	13.250	1.490	51.300	21.570	7.370

20

Table 14 Basic dimensions and section properties of cold-formed curled *Z* steel (continued)

Specifica	Dimensions mm	Theo	Sec	Moment of inertia cm^4	R	Pro	Section

tion					retical weight kg/m	tional area cm^2					adius of gyratio n cm	duct of inertia cm^4	modulus cm^3	
$H_{ZJ} \times B_{ZJ} \times C_{ZJ} \times t_1$	H_{ZJ}	B_{ZJ}	C_{2J}	t_1			I_x	I_y	I_u	I_v	r_v	I_{xy}	W_x	W_y
120 × 50 × 20 × 3.0	120	50	20	3.0	5.540	7.050	150.140	40.880	175.920	15.110	1.460	58.990	25.020	8.430
140 × 50 × 20 × 2.5	140	50	20	2.5	5.110	6.510	188.502	36.358	210.140	14.720	1.503	61.321	26.928	7.458
140 × 50 × 20 × 3.0				3.0	6.040	7.695	219.848	41.554	244.527	16.875	1.480	70.775	31.406	8.567
160 × 60 × 20 × 2.5	160	60	20	2.5	5.870	7.480	288.120	58.150	323.130	23.140	1.760	96.320	36.010	9.900
160 × 60 × 20 × 3.0	160	60	20	3.0	6.950	8.850	336.660	66.660	376.760	26.560	1.730	111.510	42.080	11.390
160 × 70 × 20 × 2.5	160	70	20	2.5	6.270	7.980	319.130	87.740	374.760	32.110	2.010	126.370	39.890	12.760

160 × 70 × 20 × 3.0	160	70	20	3.0	7.42	9.4	373	10	437	37.	1.	146	46.	14.
					0	50	.640	1.100	.720	030	980	.860	710	760
180 × 70 × 20 × 2.5	180	70	20	2.5	6.68	8.5	422	88.	476	35.	2.	144	46.	12.
					0	10	.926	578	.503	002	028	.165	991	884
180 × 70 × 20 × 3.0				3.0	7.92	10.	496	10	558	40.	2.	167	55.	14.
					4	095	.693	2.345	.511	527	003	.926	188	940
230 × 75 × 25 × 3.0	230	75	25	3.0	9.57	12.	951	13	1	59.	2.	265	82.	18.
					3	195	.373	8.928	030.579	722	212	.752	728	901
230 × 75 × 25 × 4.0				4.0	12.5	15.	122	17	132	74.	2.	335	10	23.
					18	946	2.685	3.031	0.991	725	164	.933	6.320	703
250 × 75 × 25 × 3.0	250			3.0	10.0	12.	116	13	1	62.	2.	290	92.	18.
					44	795	0.008	8.933	236.730	211	205	.214	800	902
250 × 75 × 25 × 4.0				4.0	13.1	16.	149	17	1	77.	2.	366	11	23.
					46	746	2.957	3.042	588.130	869	156	.984	9.436	704
300 × 100 × 30 × 4.0	300	100	30	4.0	16.5	21.	282	41	3	17	2.	794	18	42.
					45	211	8.642	6.757	066.877	8.522	901	.575	8.576	526

300 × 100 × 30 × 6.0				6.0	23.80	30.615	3 944.956	54 8.081	4 258.604	23 4.434	2. 767	1 078.794	26 2.997	56. 503
400 × 120 × 40 × 8.0	400	120	40	8.0	40.789	52.293	11 648.355	1 293.651	12 363.204	57 8.802	3. 327	2 813.016	58 2.418	11 1.522
400 × 120 × 40 × 10				10	49.692	63.708	13 835.982	1 463.588	14 645.376	65 4.194	3. 204	326 6.384	69 1.799	12 7.269

Table 15 Basic dimensions and section properties of lipped equal angles

Specification	Dimensions mm			Theoretical weight kg/m	Sectional area cm^2	Center of gravity Y_0 cm	Moment of inertia cm^4			Radius of gyration cm			Section modulus cm^3	
$B_{JJ} \times C_{JJ} \times t_1$	B_{JJ}	C_{JJ}	t_1				$I_x = I_y$	I_u	I_v	$r_x = r_y$	r_u	r_v	$W_{ymax} = W_{xmax}$	$W_{ymin} = W_{xmin}$
40 × 15 × 2.0	40	15	2.0	1.530	1.950	1.404	3.930	5.740	2.120	1.420	1.720	1.040	2.800	1.510
60 × 20 × 2.0	60	20	2.0	2.320	2.950	2.026	13.830	20.560	7.110	2.170	2.640	1.550	6.830	3.480
75 × 20 × 2.0	75	20	2.0	2.790	3.550	2.396	25.600	39.010	12.190	2.690	3.310	1.810	10.680	5.020

75 × 20 × 2.5	75	20	2.5	3.420	4.360	2.401	30.760	46.910	14.600	2.660	3.280	1.830	12.810	6.030

6.1.2.3 Outer corner radius of open sections

The outer corner radius of the bent portion shall comply with the provisions of Table 16. Upon agreement between the supplier and the purchaser and specified in the contract, open sections with other outer corner radii may also be supplied.

Table 16 Outer corner radius of open sections

Unit in millimeters

Upper yield strength grade/MPa	Outer arc radius R		
	Wall thickness t		
	$t \leq 4.0$	$4.0 < t \leq 12.0$	12.0
235	$(1.5 \sim 2.5)t$	$(2.0 \sim 3.0)t$	$(2.5 \sim 3.5)t$
355,390	$(2.0 \sim 3.0)t$	$(2.0 \sim 3.5)t$	(2.5~4.0) t
420, 460	$(2.0 \sim 3.0)t$	$(2.5 \sim 4.0)t$	
Grade 500 and above	Agreement between supplier and purchaser		

6.1.2.4 Permissible deviations for dimensions of open steel sections

6.1.2.4.1 The permissible deviations for the length of non-free edges of open steel sections shall comply with the provisions of Table 17.

Table 17 Permissible deviations for length of non-free edges of open steel sections

Unit: mm

Nominal edge thickness t_1	Edge length				
	≤40	>40~100	>100~200	>200~400	>400
≤4.0	±0.50	±0.75	±1.00	-	-
>4.0~8.0	-	±1.00	±1.50	±2.00	±2.50
>8.0~12.0	-	-	±2.00	±2.50	±3.00
>12.0~19.0	-	-	-	±3.00	±3.50

6.1.2.4.2 The permissible deviation of the free edge length of open-section steel shall comply with the provisions of Table 18.

Table 18 Permissible deviation of free edge length of open-section steel

Unit: mm

Nominal edge thickness t_1	Edge length				
	≤40	>40~100	>100~200	>200~300	>300
≤4.0	±1.00	±1.00	±1.50	-	-
>4.0~8.0	±1.25	±1.50	±2.00	±2.00	-
>8.0~12.0	-	±2.00	±2.50	±2.50	±3.00
>12.0	-	-	-	±3.00	±3.50

6.1.2.4.3 When the nominal dimensions of two free edge lengths are equal, the difference between their actual dimensions shall not exceed 75% of the tolerance. When the nominal dimensions of two free edge lengths are unequal, the permissible deviation of the larger edge length shall apply.

6.1.2.4.4 The permissible deviation of the edge thickness of the flat part of open-section steel shall comply with the provisions of Appendix B. For open-section steel with an edge thickness greater than *3* mm , the reduction in edge thickness in the bending angle area (inner and outer arc radius areas) shall not exceed 10% of the nominal wall thickness of the steel. For open-section steel with an edge thickness not greater than *3* mm , the bending angle area is generally not subject to measurement requirements; if the purchaser has requirements, it shall be agreed upon by both the supplier and the purchaser.

6.1.2.5 Permissible deviation of bending angle for open-section steel

The permissible deviation of the bending angle shall comply with the provisions of Table 19.

Table 19 Permissible deviation of bending angle for open-section steel

Shorter side length/mm	Permissible deviation /(°)
≤ *10*	±3.0
>10~40	±2.0
>40~80	±1.5

>80	±*1.0*

6.1.2.6 Measurement locations

The measurement locations for the dimensions of open steel sections shall comply with the provisions of Table 20. Subject to agreement between the supplier and the purchaser and specified in the contract, products with end-shaped sections may also be supplied, with specific measurement locations and methods agreed upon by both parties.

Table 20 Measurement locations for open steel sections

Unit in millimeters

Maximum side length of open-section steel	Measurement position from the end, not less than
≤100	200
>100~300	300
>300~500	400
>500	Agreement

6.2 Length and Permissible Deviations

6.2.1 Closed Section Steel

6.2.1.1 The delivery length of closed section steel is usually *4000* mm ~ *12000* mm . Other lengths may be supplied upon agreement between the supplier and the purchaser.

6.2.1.2 When closed section steel is delivered in fixed or multiple lengths, it shall be specified in the contract. The permissible deviations in length shall comply with the provisions of Table 21. If the fixed length precision is not specified in the contract, it shall be delivered as standard fixed length.

Table 21 Fixed Length and Permissible Deviations

Unit: mm

Fixed length accuracy	Length	Permissible deviation
Standard fixed length	4000~12000	+*50* 0
Precision fixed length	4000~6000	+*5* 0

	>6 000~12 000	+*10* 0

6.2.1.3 Closed-section steel is not allowed to be delivered with butt joints. Short lengths and random lengths of not less than 2000 mm are permitted. The weight of short and random length pipes shall not exceed *5*% of the total delivery quantity. For steel sections with a theoretical weight greater than *20* kg/m , it shall not exceed 10% of the total delivery quantity.

6.2.2 Open-section steel

6.2.2.1 Open-section steel is usually supplied in lengths of *4000* mm ~ *16000* mm . Upon agreement between the supplier and the purchaser and specified in the contract, steel sections exceeding the above-specified lengths may also be supplied.

6.2.2.2 When open-section steel is delivered in fixed or multiple lengths, it shall be specified in the contract. When delivered in fixed or multiple lengths, the permissible length deviation shall comply with the provisions of Table 22. If the fixed length precision is not specified in the contract, it shall be delivered as standard fixed lengths.

Table 22 Permissible length deviation

Unit in millimeters

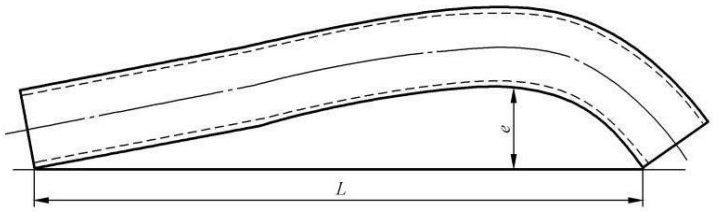
Cut-to-length accuracy	Length	Permissible deviation
Standard cut-to-length	4000~16000	+*50* 0
Precision cut-to-length	4000~8000	+*5* 0
	>8 000~16 000	+*10* 0

6.2.2.3 Open cold-formed steel sections may be delivered in short lengths or non-fixed lengths not less than 2000 mm, or as sections with butt joints (circumferential welds), provided that the purchaser removes the butt joints (circumferential welds) during use. The weight of short-length and non-fixed-length sections shall not exceed 5% of the total delivery quantity.

6.3 Shape

6.3.1 Closed sections

6.3.1.1 The camber of the section shall not exceed *2* mm per meter, and the total camber shall not exceed 0.15% of the total length. See Figure 16 for the measurement method.



Key to symbols:

L—length;

e—camber.

Figure 16 Determination of camber deviation

6.3.1.2 Upon agreement between the supplier and the purchaser and specified in the contract, the twist of closed cold-formed sections may be measured on a platform. The measurement method shall be as shown in Figure 17, and the measured value shall be less than the V value and calculated according to formula (1):

$$V = 2 + L \times 0.5/1000 \qquad (1)$$

Where:

V —twist, in millimeters (mm);

L —length, in millimeters (mm).

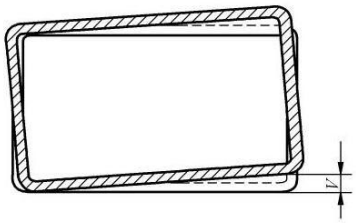


Figure 17 Schematic diagram of twist measurement for square or rectangular sections

Key to symbols:

V —twist.

6.3.1.3 The ends of the sections shall be cut square, and the cutting deviation shall comply with the provisions of Table 23. Minor deformation and burrs caused by the cutting method are permitted.

Table 23 Provisions for sawing inclination

Unit in millimeters

Maximum nominal side length (or nominal outer	Sawing deviation, less

diameter)	than
≤100	2
>100~300	4
>300~500	6
>500	Agreement

6.3.1.4 The out-of-roundness of circular section steel (the difference between the maximum and minimum measured outer diameters in the same cross-section) shall comply with the requirements of Table 24.

Table 24 Out-of-roundness of circular section steel

Unit in millimeters

Nominal diameter (DN)	Nominal outside diameter (D)	Out-of-roundness not greater than
15	21.0(21.3)	0.30
20	26.8(26.9)	0.35
25	33.5(33.7)	0.40
32	42.3(42.4)	0.40
40	48.0(48.3)	0.50
50	60.0(60.3)	0.60
65	75.5(76.1)	0.60
80	88.5(88.9)	0.70
100	114.0(114.3)	0.80
125	140.0(139.7)	1.00
150	165.1(168.3)	1.20
200	219.0(219.1)	1.60

-	>219.1	Out-of-roundness of round steel ends: When $D \leq 610$, $0.5\%D$; When $610 < D \leq 1219$, and: When $--$ $D/t \leq 75$, $1\%D$ or 13, whichever is smaller; When $--$ $D/t > 75$, by agreement; When $D > 1219$, determined by negotiation between the supplier and the purchaser

Note 1: Nominal diameter (DN) is a code for internal diameter, and its value is not used for calculation. Note 2: In nominal outside diameter (D), values in brackets are Series 1, and values outside brackets are Series 2.

6.3.2 Open-section steel profiles

6.3.2.1 The camber of the steel profile shall not exceed 2 mm per meter, and the total camber shall not exceed 0.2% of the total length.

6.3.2.2 The convexity or concavity of the flat parts of the steel profile shall not exceed 0.6% of the corresponding side length, with a minimum of 0.4 mm.

6.3.2.3 Upon agreement between the supplier and the purchaser and specified in the contract, the twist of open cold-formed steel profiles may be measured. Measurement shall be performed on a platform, and the measured value shall be less than the V value, calculated according to formula (1):

$$V = 2 + L \times 0.5/1000 \qquad (1)$$

Where:

V — twist, in millimeters (mm);

L — length, in millimeters (mm);

6.3.2.4 The ends of the steel profile shall be cut square; minor deformations and burrs caused by cutting are permitted.

6.3.3 Requirements for thermal cutting of steel profiles

For open and closed cold-formed steel profile products using online thermal cutting processes such as laser cutting or plasma arc cutting, minor cutting striations, dross, and piercing notches are permitted. When the total side length of the open or closed steel profile exceeds 700 mm , more than two piercing notches are permitted on the same cutting cross-section.

Note 1: Striations refer to the marks left on the cut surface of the workpiece after the cutting jet removes material during the cutting process.

Note 2: Dross refers to the solidified residue that adheres to the lower edge of the cut surface when molten metal is blown away at high speed during fusion cutting (e.g., plasma arc cutting, laser cutting).

6.4 Weight and permissible deviations

Steel profiles shall be delivered based on actual weight. Upon request by the purchaser and agreement between the supplier and the purchaser, and specified in the contract, delivery may also be based on theoretical weight.

When delivered based on theoretical weight, if the total side length of the steel profile does not exceed *1600* mm , the permissible deviation between the actual weight and theoretical weight of each batch of steel profiles shall be $-6\% \sim +10\%$. When the total side length of the steel profile exceeds *1600* mm , the permissible deviation between the actual weight and theoretical weight of each batch of steel profiles shall be $-4\% \sim +6\%$.

6.5 Grade and chemical composition

6.5.1 The grades and chemical compositions (heat analysis) of raw materials and section steel shall comply with the provisions of GB/T 699, GB/T 700, GB/T 714, GB/T 1591, GB/T 3280, GB/T 4171, GB/T 20878, GB/T 33162, etc. Upon request by the purchaser, through negotiation between the supplier and the purchaser, and specified in the contract, section steel of other grades may also be provided.

6.5.2 Section steel shall be accepted based on heat analysis. When the purchaser requires product analysis, it shall be specified in the contract. The permissible deviations of the chemical composition of the finished section steel shall comply with the provisions of GB/T 222.

6.5.3 Zinc ingots for galvanizing shall comply with the provisions for grade Zn99.995 or Zn99.99 in GB/T 470-2008.

6.6 Raw Materials

6.6.1 Dimensional deviations of raw steel strips shall comply with the provisions of the corresponding material standards. When not specified in the material standards, they shall comply with the provisions of GB/T 709.

6.6.2 Before galvanizing, section steel shall be inspected for dimensions, shape, surface, and mechanical properties.

6.7 Manufacturing Process

6.7.1 Closed section steel is usually produced by a continuous roll cold-forming process. However, for closed section steel with a wall thickness of *18* mm and above, a secondary forming process may also be used.

6.7.2 Open section steel is usually produced by a continuous roll cold-forming process, and may also be produced by stamping or bending processes.

6.7.3 The welding process for closed section steel may adopt straight-seam high-frequency electric welding, straight-seam submerged arc welding, or spiral-seam submerged arc welding, etc.

6.8 Mechanical Properties

6.8.1 The yield strength, tensile strength, and elongation after fracture of section steel shall comply with the provisions of Table 25. The mechanical properties of Q195, Q215, stainless steel, or other steel grades shall be determined through negotiation between the supplier and the purchaser.

Table 25 Mechanical Properties

No.	Product yield strength grade	Upper yield strength R_{eH}/MPa not less than	Tensile strength R_m/MPa	Elongation after fracture A/% not less than
1	235	235	370~560	24
2	355	355	470~680	20
3	390	390	490~700	18
4	420	420	520~730	Agreement
5	460	460	550~770	Agreement

Table 25 Mechanical Properties (continued)

No.	Product yield strength	Upper yield strength R_{eH}/MPa	Tensile strength R_m/MPa	Elongation after fracture A/% not less

	grade	not less than		than
6	500	500	610~820	Agreement
7	550	550	670~880	Agreement
8	620	620	710~940	Agreement
9	690	690	770~1000	Agreement
10	750	750	750~1010	Agreement

For cold-formed steel products with a cross-sectional dimension not greater than *60* mm × *60*mm (including circular and rectangular cold-formed steel with equal perimeter) or cold-formed steel products with a side (short side) to thickness ratio not greater than 14, the elongation after fracture of the flat part is allowed to be 3% (absolute value) lower than specified in the table, using a tensile test specimen width of *12.5* mm

6.8.2 Upon agreement between the supplier and the purchaser and specified in the contract, impact tests may be conducted on cold-formed steel with a thickness of not less than *6* mm . The results of the impact test and its re-inspection shall comply with the provisions of relevant raw material standards such as GB/T 699, GB/T 700, GB/T 714, GB/T 1591, and GB/T 4171.

6.9 Surface Quality

6.9.1 The surface of the section steel shall be smooth and free of folds, cracks, bubbles, scars, inclusions, laminations, lap welds, and burn-throughs; indentations, scratches, and pressed-in iron oxide scale with a depth (height) not exceeding half of the thickness tolerance are permitted.

6.9.2 Surface defects of section steel may be removed by grinding, provided that the grinding depth does not exceed the negative tolerance of the nominal wall thickness and the thickness of the section steel after grinding is not less than the minimum allowable thickness.

6.9.3 When the purchaser has special requirements for surface quality, it shall be negotiated by both the supplier and the purchaser and specified in the contract.

6.10 Weld Quality

6.10.1 External weld quality

Closed-section steel welds shall be free of unwelded spots, lap welds, burn-throughs, misalignment, and arc craters. Defects in welds may be repaired by welding and grinding, but the repaired area must be smooth and level, and the thickness after grinding shall not be less than the minimum allowable thickness.

6.10.2 External weld burrs

External burrs at the weld seam of closed steel sections shall be removed, and the remaining weld reinforcement after removal shall generally not exceed 0.5 mm. Internal burrs at the weld seam are generally not removed; if there are special requirements, they shall be determined through consultation between the supplier and the purchaser.

6.10.3 Internal Weld Quality

The internal welds of closed steel sections shall be continuous, uniform, and full.

6.10.4 Other Requirements

Subject to negotiation between the supplier and the purchaser and specified in the contract, requirements for weld locations may be added, mechanical and technological properties of welds may be tested, and non-destructive testing may be performed.

6.11 Galvanized layer

6.11.1 Galvanizing Methods

Hot-dip galvanizing shall be used for galvanized steel sections.

6.11.2 Galvanized coating weight

The galvanized coating weight of galvanized steel sections shall be measured. The weight per unit area of the galvanized coating on the inner and outer surfaces of closed galvanized steel sections shall be no less than *200* g/m^2 . Subject to negotiation between the supplier and the purchaser and specified in the contract, closed galvanized steel sections with other coating weights, where the weight per unit area on the inner and outer surfaces is no less than *200* g/m^2 , may also be supplied.

The measurement method for the galvanized coating weight of closed steel sections shall be in accordance with Appendix C.

The measurement method for the galvanized coating weight of open steel sections shall be negotiated between the supplier and the purchaser.

6.11.3 Galvanized coating uniformity test

Closed galvanized steel sections shall undergo a zinc coating uniformity test. During the test, the specimen (excluding the weld area) shall not turn red (copper-plated color) after being immersed in a copper sulfate solution for 3 consecutive times. The measurement method for the uniformity of the galvanized coating on steel sections shall be in accordance with Appendix D.

The zinc coating uniformity test for open galvanized steel sections shall be negotiated between the supplier and the purchaser.

6.11.4 Surface quality of galvanized coating

6.11.4.1 The galvanized coating on the inner and outer surfaces of galvanized steel sections shall be complete. Products leaving the factory shall be free of ungalvanized black spots and blisters; minor rough surfaces and localized zinc nodules are permitted.

6.11.4.2 After galvanizing, the surface of the steel sections may be passivated or treated by other surface treatment methods.

7 Test Methods

7.1 The dimensions and shape of the steel sections shall be measured using measuring tools that meet accuracy requirements.

7.2 The inner and outer surfaces of the steel sections shall be visually inspected piece by piece under sufficient lighting conditions.

7.3 The sampling methods and test methods for other inspection items of the steel sections shall comply with the provisions of Table 26.

Table 26 Inspection items, sampling methods, and test methods for steel sections

No.	Test Item	Test Frequency	Sampling Quantity	Sampling Method.	Test Method
1	Heat Analysis	1 time/heat	1 piece	GB/T 20066 or relevant standards	Specified in corresponding product
2	Product	1	1 piece		

	Analysis	time/heat			standards
3	Dimensions and Shape	Each piece	-	-	7.1
4	Surface	Each piece	-	-	7.2
5	Tensile Test [a,b]	1 time/batch	1 piece	GB/T 2975 longitudinal specimen	GB/T 228.1
6	Impact Test [a,b]	1 time/batch	1 piece	GB/T 2975 longitudinal specimen	GB/T 229
7	Weld	Each piece	-	6.10	6.10
8	Zinc Coating Weight	1 time/batch	Appendix C	Appendix C	Appendix C
9	Zinc Coating Uniformity Test	1 time/batch	Appendix D	Appendix D	Appendix D

a When there are no relevant provisions in GB/T 2975, longitudinal samples shall be taken from the middle of the longest flat part of the product; the flat part shall not include welds or corners. b For rectangular sections, the sampling position shall be on the wide face (excluding welds). For open sections, the sampling position shall be selected at the middle of the widest face of the open section.

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8 Inspection Rules

8.1 Inspection and Acceptance

The inspection and acceptance of the steel sections shall be carried out by the supplier's quality inspection department.

8.2 Batching Rules

Cold-formed steel sections shall be accepted in batches. Each batch shall consist of products of the same grade, same raw material batch, same specifications and dimensions, and same manufacturing process. The quantity of each batch of steel sections shall comply with the following provisions:

For products with an outer perimeter not exceeding *400* mm , the weight of each batch shall not exceed *60*t ; for products with an outer perimeter exceeding *400* mm , the weight of each batch shall not exceed 100 t.

8.3 Re-inspection and Judgment Rules

8.3.1 The judgment rules for the galvanized layer weight test results of galvanized steel sections shall comply with the following: if the average value of 3 specimens from one steel section is not lower than the specified value, the galvanized layer weight of the batch is judged as qualified; otherwise, it is judged as unqualified. For batches with unqualified galvanized layer weight, re-inspection is permitted. During re-inspection, 2 additional steel sections shall be taken from the unqualified batch. If the average value of 3 specimens from each steel section is not lower than the specified value, the galvanized layer weight of the batch is judged as qualified; if the average value of 3 specimens from any one steel section is lower than the specified value, the galvanized layer weight of the batch is judged as unqualified.

8.3.2 The re-inspection and judgment rules for other inspection items of open steel sections shall comply with the provisions of GB/T 2101; the re-inspection and judgment rules for other inspection items of closed steel sections shall comply with the provisions of GB/T 2102.

8.4 Numerical Rounding

The inspection results shall be judged using the rounding value comparison method, and the rounding rules shall comply with the provisions of GB/T*8170* .

9 Packaging, Marking, Transportation, Storage, and Quality Certificate

9.1 Packaging

9.1.1 Bundled Packaging

9.1.1.1 Steel sections are generally delivered in bundled packaging. One end of the bundled cold-formed steel sections must be aligned. Each bundle shall consist of cold-formed steel sections of the same batch number, and the maximum weight of each bundle shall comply with the provisions of Table 27.

Table 27 Provisions for Bundle Weight

Theoretical weight kg/m	Max weight per bundle t
<1	1
1~<10	3
10~<>20	5
≥20	10

9.1.1.2 Section steel shall be securely bundled with packaging steel strips or hoops. For section steel with a length not exceeding *7* m , it shall be bundled at 3 points; for lengths from *7* m to *10* m , it shall be bundled at 4 points; for lengths greater than *10* m , it shall be bundled at 5 points. The bundling positions at both ends shall be no more than *1* m from the ends.

9.1.1.3 No form of dunnage shall be used when bundling closed section steel.

9.1.2 Boxing

9.1.2.1 Section steel with high surface quality requirements shall be packed in boxes. The packing boxes shall be sturdy and may be made of wood or steel.

9.1.2.2 Each box shall consist of section steel from the same batch number. If different batch numbers are packed in the same box, each batch shall be bundled separately before being placed into the box.

9.1.2.3 The weight of each box of cold-formed section steel shall not exceed 4 t.

9.1.2.4 The exterior of the packing box shall be secured with packaging steel strips or other methods.

9.1.2.5 If boxing is required, it shall be specified in the contract by both the supplier and the purchaser.

9.1.3 Others

Section steel with a theoretical weight greater than *20* kg/m may be delivered in bulk.

9.2 Marking

9.2.1 Marking for Bundles

Each bundle (or box) of bundled or boxed section steel shall be attached with 2 tags; adhesive labels or other durable marking methods may also be used. The tags or labels shall indicate the supplier's name and trademark, product specifications, raw material grade, production batch number, this document number, weight, fixed length, manufacturing date, and the stamp of the supplier's quality inspection department.

9.2.2 Marking for Bulk Delivery

Each piece of section steel delivered in bulk shall have a label attached or a mark sprayed on the surface near both ends. The marks shall be clear, visible, and durable. The marks shall indicate the supplier's name and trademark, product specifications, raw material grade, production batch number, this document number, weight, fixed length, manufacturing date, and the stamp of the supplier's quality inspection department.

9.2.3 Marking for Galvanized Section Steel

In addition to the label attached to each bundle, each piece of galvanized section steel shall be marked on its surface with at least the following: supplier name or trademark, document number, dimensions, and traceability identification number (or code).

Example:

The designation for cold-formed square closed galvanized section steel with dimensions of *100* mm × *100* mm × *6000* mm is:

×××(Trademark) GB/T 6728—2025 F100×6000 mm ××××(Traceability code)

The designation for cold-formed rectangular closed galvanized section steel with dimensions of *100* mm × *50* mm × *6000* mm is:

×××(Trademark) GB/T 6728—2025 J100×50×6000 mm ××××(Traceability code)

The designation for circular closed galvanized section steel with an outer diameter of *21.3* mm and a length of *6000* mm is:

X X X (Trademark) GB/T*6728 − 2025*DN*15 × 6000* mm X X X X (Traceability code)

The designation for cold-formed open inward-lipped galvanized channel steel with a height of *160* mm , middle leg length of *60* mm , outer lip length of *20* mm , wall thickness of *3* mm , length of *6* m , and grade Q355B is:

×××(Trademark) GB/T 6728—2025 CN 160×60×20×3×6 000 mm—Q355B ××××(Traceability code)

9.3 Transportation

Protective measures shall be taken during the transportation, loading, and unloading of section steel to prevent damage.

9.4 Storage

The storage environment for section steel should avoid dampness, darkness, and poor air circulation.

9.5 Quality Certificate

The quality certificate for closed section steel shall comply with the provisions of GB/T 2102. The quality certificate for open section steel shall comply with the provisions of GB/T 2101.

Appendix A (Informative) Formulas for calculating section properties

Tables 1, 2, and 3 in Chapter 6 provide the nominal section properties for cold-formed square, rectangular, and circular hollow sections within the standard size range. For nominal section properties of cold-formed circular, square, and rectangular hollow sections with other sizes and thicknesses, refer to the formulas in Tables A.1 and A.2.

Table A.1 Circular hollow sections

Item	Symbol	Unit	Calculation formula
Nominal diameter	D	mm	-
Nominal thickness	t	mm	-
Nominal inner diameter	d	mm	$d = D - 2t$

Surface area per meter	As	mm^2/m	$A_s = \pi D \times 10^3$
Cross-sectional area	A	cm^2	$A = \pi(D^2 - d^2)/(4 \times 10^2)$
Theoretical weight per unit length	M	kg/m	$M = 0.785 \times A$
Moment of inertia	I	cm^4	$I = \pi(D^4 - d^4)/(64 \times 10^4)$
Radius of gyration	R	cm	$R = (I/A)^{1/2}$
Elastic modulus	Z	cm^3	$Z = (2I \times 10)/D$
Plastic modulus	S	cm^3	$S = (D^3 - d^3)/(6 \times 10^3)$
Torsional constant	J	cm^4	$J = 2I$
Torsional modulus	C	cm^3	$C = 2Z$

Table A.2 Square and rectangular hollow structural sections

Item	Symbol	Unit	Calculation formula
Short side length	B_1	mm	-
Long side length	H	mm	-
Nominal wall thickness	t	mm	-
Nominal outer arc radius	R	mm	When $t \leq 6$ mm, $R = 2.0t$ when 6 mm $< t \leq 10$ mm, $R = 2.5t$ when $t >$ 10 mm, $R = 3.0t$
Nominal inner arc radius	r	mm	$r = R -$ t
Theoretical weight per unit length	M	kg/m	$M = 0.785 \times A$

Cross-sectional area	A	cm^2	$A = [2t(B + H - 2t) - (4 - \pi)(R^2 - r^2)] /10^2$
Surface area per meter	As	mm^2/m	$A_s = 2(H + B - 4R + \pi R) \times 10^3$

Table A.2 Square and rectangular hollow sections (cont.)

Item		Symbol	Unit	Formula	
Second moment of area	Major axis (principal axis)	I_x	cm^4	$I_x = 1/10^4[BH^3/12 - (B - 2t)(H - 2t)^3/12 - 4(I_z + A_z h_z^2) + 4(I_{\bar{s}} + A_{\bar{s}} h_{\bar{s}}^2)]$	Where: $I_z = [1/3 - \pi/16 - 1/3(12 - 3\pi)]R^4$ $A_z = (1 - \pi/4)R^2$ $h_z = H/2 - [(10 - 3\pi)/(12 - 3\pi)]R$ (use " B " instead of " H " when calculating I_y) $I_s = [1/3 - \pi/16 - 1/3(12 - 3\pi)]r^4$ $A_s = (1 - \pi/4)r^2$ $h_{\S} = (H - 2t)/2 - [(10 - 3\pi)/(12 - 3\pi)]r$ (use " B " instead of " H " when calculating I_y)
	Minor axis (secondary axis)	I_y	cm^4	$I_v = 1/10^4[HB^3/12 - (H - 2t)(B - 2t)^3/12 - 4(I_z + A_z) h_z) + 4(I_{\bar{s}} + A_{\bar{s}} h_{\bar{s}}{}^2)]$	
Radius of gyration		r_x	cm	$r_x = (I_x/A)^{1/2}$	
		r_y	cm	$r_y = (I_y/A)^{1/2}$	
Elastic section modulus		W_x	cm^3	$W_x = (2I_z/H) \times 10$	

	W_y	cm^3	$W_y = (2I_y/B) \times 10$
Torsional constant	I_1	cm^4	$I_t = 1/10^4(t^3 \times h/3 + 2KA_h)$
Torsional modulus	C_t	cm^3	$C_t = 10[I_t/(t + K/t)]$ Where: $h = 2[(B-t)+(H-t)] - 2R_c(4-\pi)$ Among which, $R_c = (R+r)/2$ $A_h = (B-t)(H-t) - R_c^2(4-\pi)$ $K = 2A_h t/h$

Appendix B (Normative) Permissible deviations in wall thickness of steel sections

B.1 The permissible deviations in wall thickness of steel sections shall be in accordance with the provisions of Table B.1. When arbitrating the wall thickness of steel sections, measurements shall be taken at a distance of *50* mm from the ends of the steel sections.

Note: For open steel sections, "wall thickness" refers to "flange thickness".

Table B.1 Permissible deviations in wall thickness of steel sections

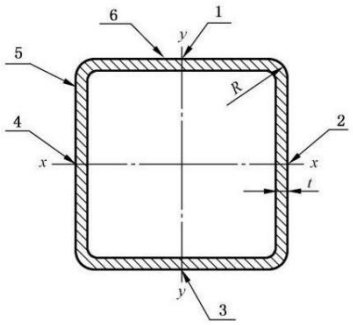
Unit: mm

No.	Wall thickness	Permissible deviation of wall thickness
1	>1.50~2.00	±*0.23*
2	>2.00~2.50	±*0.28*
3	>2.50~3.00	±*0.29*
4	>3.00~4.00	±*0.30*
5	>4.00~5.00	±*0.32*
6	>5.00~6.00	±*0.34*
7	>6.00~8.00	±*0.39*
8	>8.00~10.00	±*0.44*
9	*> 10.00 ~ 12.50*	±*0.47*

10	> *12.50 ~ 15.00*	±*0.51*
11	> *15.00 ~ 18.00*	±*0.55*
12	> *18.00 ~ 25.00*	±*1.10*
13	> *25.00 ~ 40.00*	±*1.20*
14	> *40.00 ~ 60.00*	±*1.30*

B.2 The measurement positions for arbitration of section steel wall thickness shall meet the following requirements.

a) For square or rectangular section steel, 5 measurements shall be taken on the same section of the same steel member according to Figure B.1 (square section steel) or Figure B.2 (rectangular section steel), excluding corners and welds, and the average of the 5 measurement results shall be taken. The deviation of this average from the nominal wall thickness is qualified if it meets the requirements of Table B.1. Among them, measurement position 6 in Figure B.1 and Figure B.2 shall be adjacent to the heat-affected zone of the weld, with the distance from the weld approximately equal to $2t$, with a maximum of *40* mm and a minimum of *5* mm (absolute value), and must avoid the weld and internal weld bead.



Key to reference numbers:

1 — Weld position (non-measurement position);

2 — Square section steel wall thickness measurement position (midpoint of the straight segment adjacent to the weld);

3 — Square section steel wall thickness measurement position (opposite side of the weld);

4 — Square section steel wall thickness measurement position (midpoint of the straight segment adjacent to the weld);

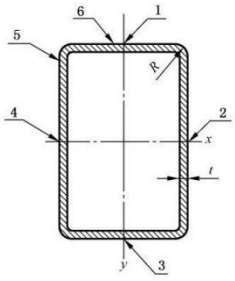
5 — Square section steel wall thickness measurement position (straight segment adjacent to the corner);

6 — Square section steel wall thickness measurement position (weld heat-affected zone);

t — Wall thickness;

R — Outer arc radius.

B.1 Schematic diagram of wall thickness measurement positions for square section steel



Key to reference numbers:

1 — Weld position (non-measurement position);

2 — Rectangular section steel wall thickness measurement position (midpoint of the straight segment adjacent to the weld);

3 — Rectangular section steel wall thickness measurement position (opposite side of the weld);

4 —— Rectangular steel wall thickness measurement position (straight section adjacent to the weld);

5 —— Rectangular steel wall thickness measurement position (straight section adjacent to the corner);

6 —— Rectangular steel wall thickness measurement position (weld heat-affected zone);

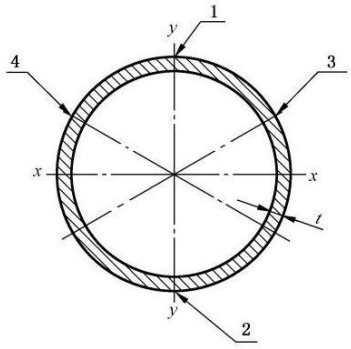
t ——wall thickness;

R ——outer arc radius;

B.2 Schematic diagram of wall thickness measurement positions for rectangular steel

b) For circular steel, select the same circular steel and the same cross-section, take 3 measurements according to Figure B.3, excluding the weld and heat-affected zone, and take the average of the 3 measurement results. The deviation between this average value and

the nominal wall thickness shall comply with the provisions of Table B.1 to be considered qualified.



Key to reference numbers:

1-weld position (non-measurement position);

2-circular steel wall thickness measurement position (opposite side of the weld, measure with appropriate measuring tools);

3-circular steel wall thickness measurement position (right measurement point of the three points evenly distributed on the outer circumference opposite the weld);

4-circular steel wall thickness measurement position (left measurement point of the three points evenly distributed on the outer circumference opposite the weld).

B.3 Schematic diagram of wall thickness measurement positions for circular steel

c) For open steel, select the same open steel and the same cross-section to measure the center of all non-free edge straight sections, and take the average value. The deviation between this average value and the nominal edge thickness shall comply with the provisions of Table B.1 to be considered qualified.

Appendix C (Normative) Determination of zinc coating weight - Antimony trichloride method

C.1 Preparation of test specimens

After galvanizing, the weight of the zinc coating on the steel sections shall be determined. Take 1 steel section at random from each batch, and cut a sample segment of *30* mm ~ *60* mm (depending on the size) from each end and the middle of each steel section. The surface of the samples shall be free of roughness and zinc nodules. The sample surface

shall be cleaned with a pure solvent such as benzene, petroleum benzene, trichloroethylene, or carbon tetrachloride, then rinsed with ethanol and cleaned with clear water.

C.2 Preparation of Test Solution

Dissolve *32* g of antimony trichloride ($SbCl_3$) or *20* g of antimony trioxide (Sb_2O_3) in *1000* mL of hydrochloric acid with a density of *1.18* kg/dm^3 or higher to prepare the stock solution. Before the test, add *5* mL of the stock solution to *100* mL of hydrochloric acid with a density of *1.18* kg/dm^3 or higher to serve as the test solution.

C.3 Test Procedure

C.3.1 Weigh the sample using a balance, rounding to the nearest *0.01* g .

C.3.2 Immerse the sample into the test solution, one sample at a time, ensuring the liquid level is above the sample. The temperature of the solution shall not exceed *38* °C during the measurement process.

C.3.3 When the evolution of hydrogen from the sample in the solution becomes minimal and the zinc coating has disappeared, remove the sample. Rinse the sample in clear water and wipe it dry with cotton or a clean cloth. After it is completely dry, weigh it on a balance, rounding to the nearest 0.01 g.

C.3.4 The test solution may be reused as long as it can easily remove the zinc coating.

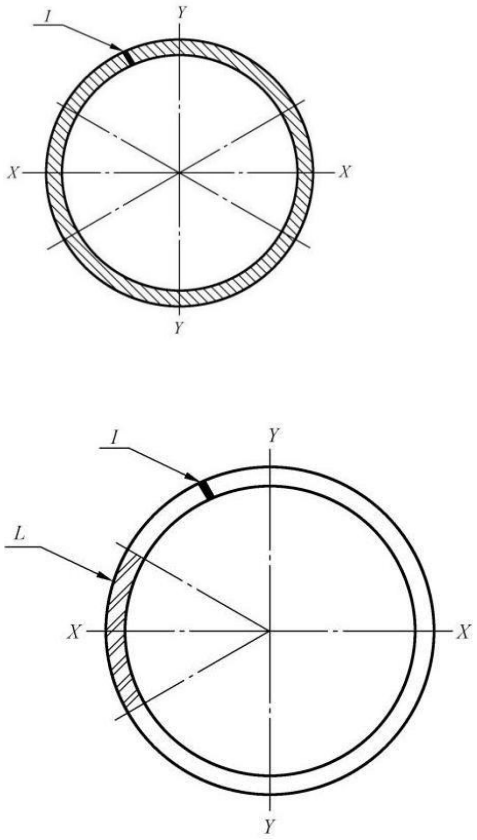
C.4 Test Operation Methods

C.4.1 Circular Galvanized Steel Sections

C.4.1.1 For circular galvanized steel sections with a nominal outer diameter not exceeding 219.1 mm, cut a pipe segment of (60 ± 2)mm in length from the head, middle, and tail of the sampled product (sampled steel pipe) as a sample [see a) in Figure C.1]. The head and tail sample blanks shall be cut from positions at least *500* mm away from the pipe ends. The surface of the samples shall be free of roughness and zinc nodules.

C.4.1.2 For circular galvanized sections with a nominal outside diameter of > *219.1* mm ~ *407* mm , after cutting a sample blank (pipe segment) of (30 ± 2)mm length in accordance with C.4.1.1, a tile-shaped strip with an arc length of 1/8 of the circumference may be cut from the blank, avoiding the weld [see b) in Figure C.1].

C.4.1.3 For circular galvanized sections with a nominal outside diameter greater than *407* mm , it shall be negotiated by the supplier and the purchaser.



a) Full cross-section specimen b) Tile-shaped specimen

Key to symbols:

I—Weld position (schematic only, does not represent actual position);

L—Tile-shaped specimen.

Figure C.1 Schematic diagram of sampling for galvanized layer weight determination

C.4.1.4 After the galvanized layer of the pipe segment specimen is stripped, the outside diameter and inside diameter shall be measured in two mutually perpendicular directions at the ends of the specimen, and their respective averages shall be taken as the actual outside and inside diameters, rounded to the nearest 0.01 mm.

C.4.1.5 For tile-shaped specimens, after cutting the pipe segment according to C.1, the outside diameter and inside diameter shall be measured in two mutually perpendicular directions at the ends of the pipe segment, and their respective averages shall be taken as the actual outside and inside diameters, rounded to the nearest 0.01 mm.

C.4.2 Square and rectangular galvanized sections

C.4.2.1 After the zinc layer of the specimen is stripped, the side length of square sections shall be measured in two mutually perpendicular directions at the ends of the

specimen, and the average of the measurements shall be taken as the actual side length, rounded to the nearest *0.1* mm .

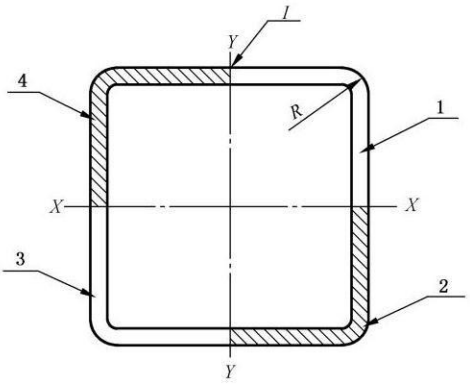
C.4.2.2 After the zinc layer of the specimen is stripped, the short (long) side length of rectangular sections shall be measured in the parallel directions of the two short (long) sides at the ends of the specimen, and the average of the measurements shall be taken as the actual short (long) side length, rounded to the nearest *0.1* mm .

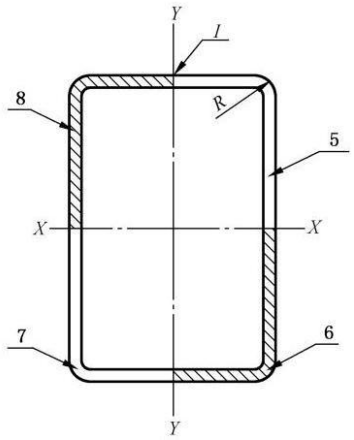
C.4.2.3 For square and rectangular galvanized sections with a side length not greater than *300* mm , pipe segments of (60 ± 2)mm length shall be cut from the head, middle, and tail of the sampled product (sampled section) as specimens, among which the head and tail blanks shall be cut at a position at least *500* mm away from the pipe ends. The surface of the specimen shall be free of rough areas and zinc nodules.

C.4.2.4 For square and rectangular galvanized sections with a side length of $>$ *300* mm ~ *400* mm , after cutting a sample blank (pipe segment) of (30 ± 2)mm length in accordance with C.4.2.3, the square or rectangular section shall be divided into 4 equal parts as shown in Figure C.2, and any two parts shall be taken as specimens, provided that specimens containing welds are avoided.

C.4.2.5 For square and rectangular galvanized sections with side lengths greater than *400* mm , it shall be negotiated by the supplier and the purchaser.

C.4.2.6 The side length of rectangular sections shall be based on the longer side.





a) Square section b) Rectangular section

Key to index numbers:

I — Weld position (for illustration only, does not represent the actual position);

R — Outer arc radius;

1, 2, 3, 4, 5, 6, 7, 8 — Specimen numbers.

Figure C.2 Schematic diagram of quartering square or rectangular sections

C.5 Calculation of test results

C.5.1 The total surface area of square section specimens shall be calculated according to formula (C.1):

$$A_s = 2(4B - 8R + 2\pi R - \pi t)l/10^6 \qquad \text{(C. 1)}$$

Where:

A_s — Total surface area of the specimen after stripping the zinc layer, in square meters (m^2) ;

B — — Side length of the specimen after stripping the zinc layer, in millimeters (mm) ;

R — Measured outer arc radius, in millimeters (mm);

π — Pi, taken as 3.1416;

t — — Measured wall thickness of the specimen, in millimeters (mm) ;

l — measured length of the specimen, in millimeters (mm) .

C.5.2 The total surface area of rectangular steel specimens shall be calculated according to formula (C.2):

$$A_r = 2(2B + 2H - 8R + 2\pi R - \pi t)l/10^6 \qquad \text{(C. 2)}$$

Where:

A_r — total surface area of the specimen after stripping the zinc layer, in square meters (m^2) ;

B — width of the specimen after stripping the zinc layer, in millimeters (mm) ;

H — length of the specimen after stripping the zinc layer, in millimeters (mm) ;

R — measured outer arc radius, in millimeters (mm) ;

π — pi, taken as 3.1416;

t — measured wall thickness of the specimen, in millimeters (mm) ;

l — measured length of the specimen, in millimeters (mm) .

C.5.3 For circular galvanized steel sections with a nominal outer diameter not greater than 219.1 mm, the total surface area of the specimen shall be calculated according to formula (C.3). For circular galvanized steel sections with a nominal outer diameter > 219.1 mm to 407 mm, the total surface area may be calculated by multiplying A_c by 1/8.

$$A_c = \pi(D + d)l/10^6 \qquad \text{(C. 3)}$$

Where:

A_c — total surface area of the specimen after stripping the zinc layer, in square meters (m^2) ;

D — measured outer diameter of the specimen after stripping the zinc layer, in millimeters (mm) ;

d — measured inner diameter of the specimen after stripping the zinc layer, in millimeters (mm) ;

π — pi, taken as 3.1416;

l — — measured length of the specimen, in millimeters (mm) .

C.5.4 The weight loss of the specimen after the second weighing shall be calculated according to formula (C.4):

$$\Delta m = m_1 - m_2 \qquad \text{(C. 4)}$$

where:

Δm — weight loss of the specimen after the second weighing, in grams (g) ;

m_1 — weight of the specimen before stripping the zinc layer, in grams (g) ;

m_2 — weight of the specimen after stripping the zinc layer, in grams (g) .

C.5.5 The weight of the zinc coating shall be calculated according to formula (C.5):

$m_A = \Delta m/A_s$ (or A_r or A_c)(C. 5)

Where:

m_A — weight of the galvanized layer, in grams per square meter (g/m^2) ;

Δm — weight loss of the specimen after the second weighing, in grams (g) ;

A_s (or A_r or A_c) — total surface area of the specimen after stripping the galvanized layer, in square meters (m^2) .

C. 5.6 The approximate thickness of the galvanized layer for galvanized steel sections shall be calculated according to formula (C.6).

$$e = m_A/7.14 \qquad \text{(C. 6)}$$

Where:

m_A — weight of the galvanized layer, in grams per square meter (g/m^2).

Appendix D (Normative) Uniformity Test of Galvanized Layer Copper Sulfate Immersion Method

D.1 Preparation of Specimens

After galvanizing, the steel sections shall be subjected to a uniformity test of the galvanized layer. Take one steel section at random from each batch, and cut a sample segment of not less than *150* mm in length from one end of each section as the specimen. Oil and other contaminants on the surface of the specimen shall be removed first, and then wiped clean with a soft cloth.

D.2 Preparation of Test Solution

D.2.1 Dissolve *33* g of crystalline copper sulfate ($CuSO_4 \cdot 5H_2O$) or approximately *36* g of industrial copper sulfate in *100* mL of distilled water, then add an excess of powdered copper hydroxide [$Cu(OH)_2$] or basic copper carbonate (chemically pure) [$CuCO_3$ -$Cu(OH)_2$] to neutralize the free acid. If copper hydroxide is added, use approximately 10g per 10 L of solution; if basic copper carbonate is added, use approximately 12g per 10 L of solution. The excess can be judged by the precipitate at the bottom of the container. Stir thoroughly, let stand for *24* h , and then filter until clear. If powdered copper oxide (CuO) is used instead of copper hydroxide, use approximately *8* g per 10 L of solution, but let stand for *48* h before filtering.

D.2.2 The density of the prepared test solution at room temperature shall be *1.170* kg/dm^3 ~ *1.180* kg/dm^3 .

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D.3 Test Container

D.3.1 The test container shall be made of materials that are inert to copper sulfate.

D.3.2 The internal dimensions of the container shall be such that after the specimen is immersed in the solution, a clearance of at least *25* mm is maintained from any wall of the container, except for the bottom.

D.4 Test Procedure

D.4.1 The specimen shall be immersed with the cut end facing downward to a depth of not less than *100* mm in the copper sulfate solution for 3 consecutive immersions. During the test, the temperature of the specimen and the solution shall be maintained at *20*°C ~ *25*°C , and no agitation is permitted. Each immersion of the specimen shall last for *1* min ; after removal, it shall be immediately rinsed in running clean water, and all black deposits shall be completely removed with a soft brush, then dried with a soft cloth.

D.4.2 Except for the final immersion, the specimen shall be immediately re-immersed in the solution.

D.4.3 The test solution shall be discarded after 20 immersions and shall not be reused.

D.5 Evaluation of Test Results

D.5.1 After 3 consecutive immersions and the final rinsing and drying, the specimen shall not exhibit a red color (copper-plated appearance). However, red metallic copper deposits within 25 mm from the end of the specimen and within 10 mm from the solution surface are excluded.

D.5.2 If red metallic copper deposits appear on the specimen after the above test, their adhesion may be determined by the following method: immerse in a 1:10 hydrochloric acid solution for 15s, then immediately rinse and scrub in running clean water; if the zinc layer reappears on the underlying surface, the specimen is considered acceptable.

D.5.3 If there is doubt about the presence of a zinc layer under the red metallic copper deposit, the red metallic copper deposit may be scraped off and one or more drops of dilute hydrochloric acid applied to the spot; if a zinc layer is present, active hydrogen gas will be generated. Alternatively, a qualitative test for zinc may be used: collect the dropped acid solution using a small piece of filter paper or a pipette, neutralize it with ammonium hydroxide to make it weakly acidic, add a drop of sodium sulfide solution to this solution, and observe whether a white zinc sulfide precipitate is formed.