

Roll-Formed Channel Sections: Mass per Metre, Dimensions and Section Properties

The table lists roll-formed channels to GOST 8278-83: height, flange width and wall thickness, cross-sectional area, mass of 1 m, metres per tonne, moments of inertia and resistance. A roll-formed channel is lighter than a hot-rolled one of the same size because its wall is thin.

What a roll-formed channel is and how it differs from a hot-rolled one

A hot-rolled channel is rolled while red-hot, and its web and flanges are thick. A roll-formed channel is made on a roll-forming mill: a strip of sheet steel is bent gradually by rolls into a U-shaped section. Web and flanges have the same thickness, and it is small, from 1 to 8 mm in this range.

That is why a roll-formed channel is lighter. For comparison, a hot-rolled No. 10 channel weighs 8.59 kg per metre, while a roll-formed 100×50×4 mm one weighs 5.81 kg per metre. It suits light structures: roof purlins, wall girts, posts and canopy frames. For heavy beams and large loads a hot-rolled channel is used; its sections are given on a separate page.

Roll-formed channels: dimensions and mass of 1 m

A size is written with three numbers: height *h*, flange width *b* and thickness *s*, all in millimetres. 100×50×4 means a channel 100 mm high with 50 mm flanges and 4 mm thickness. The table has 172 sizes: height from 25 to 410 mm, flange width from 20 to 180 mm.

The mass of 1 m and the cross-sectional area are taken from the standard. The “Metres per tonne” column shows how many running metres of the section make a tonne: it is 1000 divided by the mass of 1 m.

Roll-formed steel equal-leg channels · ГOCT 8278-83

Size	A, cm ²	Mass of 1 m, kg	Metres per tonne	Jx, cm ⁴	Wx, cm ³	ix, cm	Jy, cm ⁴	Wy, cm ³	iy, cm
25×26×2	1.39	1.09	917	1.43	1.14	1.01	0.96	0.6	0.83
25×30×2	1.55	1.22	820	1.64	1.31	1.03	1.42	0.78	0.96
28×27×2.5	1.81	1.42	704	2.24	1.6	1.11	1.32	—	0.85
30×25×3	2.05	1.61	621	2.73	1.82	1.15	1.24	0.81	0.78
30×30×2	1.65	1.3	769	2.5	1.67	1.23	1.53	0.82	0.96
32×25×3	2.11	1.66	602	3.2	2	1.23	1.28	0.82	0.78
32×32×2	1.77	1.39	719	3.08	1.92	1.31	1.88	—	1.03
38×95×2.5	5.48	4.3	233	15.42	8.12	1.68	49.26	9.18	3
40×20×2	1.45	1.14	877	3.4	1.7	1.53	—	—	—
40×20×3	2.05	1.61	621	4.45	2.23	1.47	0.75	0.56	0.6
40×30×2	1.85	1.45	690	4.85	2.42	1.62	1.72	0.86	0.96
40×30×2.5	2.28	1.79	559	5.83	2.91	1.6	2.09	1.06	0.96
40×40×2	2.25	1.77	565	6.29	3.15	1.67	3.79	1.49	1.3
40×40×2.5	2.78	2.18	459	7.58	3.79	1.65	4.63	1.83	1.29
40×40×3	3.25	2.55	392	8.57	4.28	1.62	5.31	2.14	1.28
42×42×4	4.45	3.49	287	12.34	5.88	1.67	7.8	3.05	1.32
43×45×2	2.51	1.97	508	8.25	3.84	1.81	5.38	1.88	1.46
45×25×3	2.5	1.96	510	7.29	3.24	1.71	1.49	0.89	0.77
45×31×2	1.99	1.56	641	6.55	2.91	1.81	1.97	0.94	0.99
48×70×5	8.49	6.67	150	32.6	13.58	1.96	41.22	10.15	2.2
50×30×2	2.05	1.61	621	8.12	3.25	1.99	1.87	0.9	0.96
50×30×2.5	2.53	1.99	503	9.82	3.93	1.97	2.28	1.11	0.95
50×32×2.5	2.63	2.07	483	10.38	4.15	1.98	2.72	1.25	1.02
50×40×2	2.45	1.92	521	10.42	4.17	2.06	4.13	1.55	1.3
50×40×2.5	3.03	2.38	420	12.64	5.06	2.04	5.05	1.92	1.29
50×40×3	3.58	2.81	356	14.55	5.82	2.02	5.88	2.26	1.28
50×40×4	4.61	3.62	276	17.8	7.12	1.97	7.35	2.89	1.26

Size	A, cm ²	Mass of 1 m, kg	Metres per tonne	Jx, cm ⁴	Wx, cm ³	ix, cm	Jy, cm ⁴	Wy, cm ³	iy, cm
50×47×6	7.3	5.73	175	26.62	10.65	1.91	15.42	5.51	1.45
50×50×2.5	3.53	2.77	361	15.46	6.18	2.09	9.31	2.92	1.62
50×50×3	4.18	3.28	305	17.87	7.15	2.07	10.89	3.44	1.61
50×50×4	5.4	4.24	236	22.04	8.82	2.02	13.72	4.44	1.59
60×26×2.5	2.56	2.01	498	13.22	4.41	2.27	1.61	0.86	0.79
60×30×2.5	2.78	2.19	457	15.07	5.02	2.33	2.43	1.14	0.93
60×30×3	3.25	2.55	392	17.1	5.7	2.29	2.8	1.33	0.93
60×32×2.5	2.89	2.26	442	15.9	5.3	2.34	2.91	1.29	1
60×32×3	3.4	2.67	375	18.31	6.1	2.32	3.38	1.52	1
60×32×4	4.37	3.43	292	22.41	7.47	2.27	4.22	1.95	0.98
60×40×2	2.65	2.08	481	15.78	5.26	2.44	4.49	1.6	1.29
60×40×3	3.88	3.04	329	22.21	7.4	2.39	6.31	2.33	1.27
60×50×3	4.45	3.5	286	26.85	8.95	2.46	11.6	3.56	1.61
60×60×3	5.08	3.99	251	31.97	10.66	2.51	19.26	5.03	1.95
60×60×4	6.6	5.18	193	40	13.33	2.46	24.55	6.53	1.93
60×80×3	6.25	4.91	204	41.49	13.83	2.58	42.02	8.59	2.59
60×90×5	11.09	8.71	115	69.97	23.32	2.51	90.96	17.18	2.86
63×21×2.2	2.14	1.68	595	11.48	3.64	2.32	0.8	0.51	0.61
65×75×4	8	6.28	159	—	—	—	46.88	10.12	2.41
68×27×1	1.18	0.93	1075	8.21	2.41	2.64	0.82	0.4	0.84
70×30×2	2.45	1.92	521	17.84	5.1	2.7	2.1	0.95	0.93
70×40×3	4.15	3.26	307	31.49	9	2.75	6.64	2.39	1.26
70×50×3	4.75	3.73	268	38.23	10.92	2.84	12.32	3.66	1.61
70×50×4	6.21	4.87	205	48.3	13.8	2.79	15.77	4.76	1.59
70×60×4	7	5.5	182	57.02	16.29	2.85	26.12	6.74	1.93
78×46×6	8.86	6.96	144	77.08	19.76	2.95	18.85	—	1.42
80×25×4	4.61	3.61	277	37.07	9.27	2.84	2.29	1.25	—
80×32×4	5.16	4.05	247	45.16	11.29	2.96	4.7	2.04	0.95
80×35×4	5.41	4.24	236	48.63	12.16	3	6.08	2.44	1.06
80×40×2.5	3.78	2.97	337	37.4	9.35	3.14	5.98	2.07	1.26
80×40×3	4.48	3.51	285	43.51	10.88	3.12	7	—	1.25
80×50×4	6.6	5.18	193	65.98	16.5	3.16	16.6	—	1.58
80×60×3	5.68	4.46	224	61.3	15.32	3.29	21.46	5.31	1.94
80×60×4	7.4	5.81	172	77.54	19.38	3.23	27.53	6.92	1.93
80×60×6	10.66	8.37	119	105.03	26.26	3.14	38.27	9.91	1.89
80×80×3	6.88	5.4	185	79.1	19.77	3.39	47.03	9.11	2.61
80×80×4	9	7.07	141	100.66	25.17	3.34	60.69	11.91	2.6
80×85×4	9.41	7.38	136	106.45	26.61	3.36	71.64	13.35	2.76
80×100×6	15.46	12.14	82.4	170.88	42.72	3.32	158.47	26.22	3.2
90×50×3.5	6.2	4.87	205	78.16	17.37	3.55	15.5	4.42	1.58
90×54×5	8.99	7.06	142	110.99	24.66	3.51	25.94	7.07	1.7
90×100×2.5	7.01	5.5	182	106.27	23.62	3.89	75.7	11.83	3.29
100×40×2.5	4.28	3.36	298	63.16	12.63	3.84	6.41	2.14	1.22
100×40×3	5.05	3.97	252	73.11	14.62	3.8	7.5	2.53	1.22
100×50×3	5.68	4.47	224	87.88	—	3.93	14.05	3.9	1.57
100×50×4	7.4	5.81	172	111.44	22.29	3.88	18.01	5.07	1.56
100×50×5	9.09	7.14	140	133.39	26.68	3.83	21.72	6.2	1.55
100×50×6	10.66	8.37	119	151.84	30.37	3.77	25.03	7.26	1.53
100×60×3	6.28	4.93	203	—	—	—	23.25	5.52	1.92
100×60×4	8.2	6.44	155	129.89	25.98	3.98	29.93	7.2	1.91
100×80×3	7.48	5.87	170	130.23	26.05	4.17	51.03	9.49	2.61
100×80×4	9.8	7.7	130	166.77	33.35	4.12	66.07	12.43	2.59

Size	A, cm ²	Mass of 1 m, kg	Metres per tonne	Jx, cm ⁴	Wx, cm ³	ix, cm	Jy, cm ⁴	Wy, cm ³	iy, cm
100×80×5	12.09	9.49	105	201.14	40.23	4.08	80.47	15.29	2.58
100×100×3	8.65	6.79	147	157.81	31.56	4.27	93.15	14.37	3.28
100×100×6	16.66	13.08	76.5	284.56	56.91	4.13	173.39	27.49	3.22
100×160×4	16.2	12.72	78.6	314.31	62.86	4.4	436.25	45.27	5.19
104×20×2	2.73	2.14	467	35.64	6.85	3.61	0.73	0.45	0.52
106×50×4	7.64	6	167	127.9	24.13	4.09	18.38	5.12	1.55
108×70×6	13.54	10.63	94.1	245.48	45.46	—	66.59	14.15	2.22
110×26×2.5	3.83	3.01	332	58.96	10.72	3.92	1.93	0.93	0.71
110×50×4	7.8	6.13	163	139.63	25.39	4.23	18.61	5.15	1.54
110×50×5	9.59	7.53	133	167.57	30.47	4.18	22.47	6.29	1.53
110×100×4	11.81	9.27	108	252.05	45.83	4.62	125.87	19.23	3.27
120×25×4	6.2	4.87	205	104.42	17.4	4.1	2.57	1.31	—
120×50×3	6.25	4.91	204	133.77	22.29	4.63	14.85	3.99	1.54
120×50×4	8.2	6.44	155	171.72	28.62	4.57	19.15	5.21	1.53
120×50×6	11.86	9.31	107	236.44	39.41	4.46	26.75	7.48	1.5
120×60×4	9	7.07	141	198.65	33.11	4.7	31.91	7.42	1.88
120×60×5	11.09	8.71	115	239.63	39.94	4.67	38.73	9.1	1.87
120×60×6	13.06	10.25	97.6	275.47	45.91	4.59	44.95	10.7	1.85
120×70×5	12.09	9.49	105	272.71	45.45	4.75	59.56	12.25	2.22
120×80×4	10.6	8.32	120	252.49	42.08	4.88	70.65	12.84	2.58
120×80×5	13.09	10.28	97.3	305.8	50.97	4.83	86.2	15.81	2.57
140×40×2.5	5.28	4.15	241	141.38	20.2	5.17	7.04	2.23	1.15
140×40×3	6.25	4.91	204	164.66	23.52	5.13	8.26	2.63	1.15
140×60×3	7.45	5.85	171	220.97	31.57	5.45	26.89	5.79	1.86
140×60×5	12.09	9.49	105	345.47	49.35	5.34	40.8	9.32	1.84
140×60×6	14.26	11.2	89.3	398.68	—	5.29	47.46	10.97	1.82
140×70×5	13.09	10.28	97.3	391.05	55.86	5.47	62.87	12.56	2.19
140×80×4	11.4	8.95	112	359.42	51.35	5.61	74.59	—	2.56
140×80×5	14.09	11.06	90.4	436.63	62.38	5.57	91.13	16.23	2.54
145×65×3	7.9	6.2	161	255.04	35.18	5.68	32.69	6.78	2.03
148×25×4	7.32	5.75	174	—	—	—	—	—	—
160×40×2	4.65	3.66	273	158.77	19.58	5.84	5.93	1.83	1.13
160×40×3	6.85	5.38	186	228.59	28.57	5.78	8.56	2.67	1.12
160×40×5	11.09	8.71	115	355.32	44.31	5.66	—	—	—
160×50×2.5	6.26	4.92	203	225.47	28.18	6	13.68	3.48	1.48
160×50×4	9.81	7.7	130	343.12	42.42	5.91	20.87	5.41	1.46
160×50×5	12.09	9.49	105	415.41	51.93	5.86	25.29	6.63	1.45
160×50×6	14.26	11.2	89.3	479.22	59.9	5.8	29.35	7.8	1.43
160×60×2.5	6.76	5.31	188	256.48	32.06	6.16	22.79	4.96	1.84
160×60×3	8.05	6.32	158	302.54	37.82	6.13	26.95	5.89	1.83
160×60×4	10.6	8.32	120	391.8	48.97	6.08	34.98	7.72	1.82
160×60×5	13.09	10.28	97.3	475.49	59.44	6.03	42.56	9.49	1.8
160×60×6	15.46	12.14	82.4	550.41	68.8	5.97	49.68	11.18	1.79
160×70×4	11.4	8.95	112	440.48	55.06	6.21	53.86	10.4	2.17
160×80×2.5	7.78	6.11	164	319.89	39.99	6.41	50.52	8.59	2.55
160×80×3	9.25	7.26	138	376.5	47.06	6.38	59.79	10.22	2.54
160×80×4	12.2	9.58	104	489.16	61.14	6.33	78.01	13.44	2.53
160×80×5	15.09	11.85	84.4	595.66	74.46	6.28	95.4	16.57	2.51
160×80×6	17.86	14.02	71.3	692.78	86.6	6.23	111.72	19.59	2.5
160×100×3	10.45	8.28	121	452.12	56.31	6.56	110.04	15.59	3.24
160×100×6	20.26	15.91	62.9	835.14	104.39	6.42	207.59	30.04	3.2
160×120×5	19.09	14.99	66.7	836.99	104.5	6.62	291.01	35.78	3.9

Size	A, cm ²	Mass of 1 m, kg	Metres per tonne	Jx, cm ⁴	Wx, cm ³	ix, cm	Jy, cm ⁴	Wy, cm ³	iy, cm
160×160×6	27.46	21.56	46.4	1262.25	157.78	6.78	750.85	72.82	5.23
170×60×4	11	8.64	116	452.84	53.27	6.41	35.61	7.78	1.8
170×70×5	14.59	11.45	87.3	618.28	—	6.51	66.99	12.92	2.14
170×70×6	17.26	13.55	73.8	718.44	84.52	6.45	78.32	15.25	2.13
180×40×3	7.45	5.85	171	306.23	34.03	6.41	8.79	2.7	—
180×40×4	9.81	7.7	130	395.47	43.94	6.35	11.3	3.52	1.07
180×50×4	10.6	8.32	120	457.43	50.82	6.57	21.53	5.48	1.42
180×70×6	17.85	14.02	71.3	823.93	91.55	6.79	79.76	15.38	2.11
180×80×4	13	10.21	97.9	643.32	71.48	7.03	—	—	—
180×80×5	16.09	12.68	78.9	784.86	87.21	6.98	99.15	16.86	2.48
180×80×6	19.08	14.96	66.8	914.79	101.79	6.93	116.23	19.94	2.47
180×100×5	18.09	14.2	70.4	936.03	104.23	7.2	184.04	25.85	3.19
180×100×6	21.46	16.84	59.4	1096.52	121.84	7.15	216.45	30.63	3.18
180×130×8	32.82	25.76	38.8	1746.62	194.07	7.29	574.59	65.86	4.18
185×100×3	11.2	8.79	114	626.06	67.68	7.48	115.48	15.93	3.21
200×50×3	8.65	6.79	147	456.99	45.7	7.27	17.09	4.24	1.41
200×50×4	11.41	8.95	112	592.95	59.3	7.21	22.11	5.54	1.39
200×80×4	13.81	10.83	92.3	823.48	82.35	7.72	83.67	13.86	2.46
200×80×5	17.09	13.42	74.5	1006.26	100.63	7.67	102.45	17.1	2.45
200×80×6	20.26	15.91	62.9	1174.93	117.49	—	120.22	20.24	2.44
200×100×3	11.65	9.15	109	748.08	74.81	8.01	118.41	16.11	3.19
200×100×6	22.66	17.79	56.2	1400.08	140.08	7.86	224.37	31.14	3.15
200×180×6	32.26	25.33	39.5	2304.37	230.44	8.45	1122.23	94.54	5.9
205×38×2.5	6.81	5.34	187	351.96	34.34	7.19	6.62	2.08	0.99
206×75×6	20.02	15.72	63.6	1200.75	116.58	7.74	101.09	17.92	2.25
210×57×4	12.37	9.71	103	728.59	69.39	7.68	32.59	7.21	1.62
250×35×3	9.25	7.26	138	657.45	52.6	8.43	6.34	2.12	0.83
250×60×3	10.75	8.44	118	886.25	70.9	9.08	30.27	6.19	1.68
250×60×4	14.21	11.15	89.7	1156.1	92.49	9.02	39.37	8.12	1.66
250×60×5	17.59	13.81	72.4	1413.5	113.08	8.96	48.01	9.99	1.65
250×60×6	20.86	16.38	61.1	1650.53	132.04	8.89	56.16	11.79	1.64
250×125×6	28.66	22.5	44.4	2811.72	224.94	9.9	448.01	49.33	3.95
270×100×7	31.11	24.42	41	3254.41	241.07	10.23	283.03	37.48	3.02
280×60×3.9	15.03	11.8	84.7	1495.61	106.83	9.98	39.47	8.01	1.62
280×140×5	27.09	21.27	47	3388.17	242.01	11.18	536.69	52.31	4.45
300×80×6	26.26	20.62	48.5	3131.48	208.77	10.92	134.74	21.25	2.27
300×100×8	37.62	29.53	33.9	4694.84	312.98	11.17	327.88	42.94	2.95
310×100×6	29.26	22.97	43.5	3948.93	—	11.62	256.39	33.01	2.96
380×65×6	29.26	22.97	43.5	4998.26	—	13.07	77.71	14.37	1.63
400×95×8	44.82	35.18	28.4	9179.84	458.99	14.31	305.12	40.06	2.61
410×65×6	31.06	24.38	41	6077.35	296.46	13.99	78.82	14.45	1.59

Size $h \times b \times s$, mm. A is the cross-sectional area. Jx, Wx, ix are the moment of inertia, section modulus and radius of gyration about the x–x axis, perpendicular to the web (load in the plane of the web). Jy, Wy, iy are the same about the y–y axis, parallel to the web. A dash marks a value that could not be confirmed by calculation from the text of the standard.

How to get the mass from the table

Mass is the mass of 1 m times the length. A 100×50×4 mm channel has 5.81 kg per metre, so a six-metre piece weighs about 35 kg. A 200×80×5 mm channel has 13.42 kg per metre, and six metres give about 80.5 kg.

If you buy by weight, look at the “Metres per tonne” column. For 100×50×4 mm it shows 172 m: that much section makes a tonne.

Calculator and ordering

The metal weight calculator gives the mass of a batch of channels quickly. Other sections are collected in the rolled metal handbook. If you need a structure made of roll-formed sections to your drawings, send them with the request and we will price fabrication and galvanizing.

Frequently asked questions

How much does a 100×50×4 roll-formed channel weigh?

A 100×50×4 mm channel weighs 5.81 kg per metre. A six-metre piece is about 35 kg, and a tonne is 172 m.

What do the three numbers in a roll-formed channel designation mean?

The height of the section, the flange width and the wall thickness, in millimetres. For example, 160×60×4 is a channel 160 mm high with 60 mm flanges and a 4 mm wall.

How does a roll-formed channel differ from a hot-rolled one?

A roll-formed channel is made by bending sheet on a roll-forming mill, so its wall is thinner and its mass lower. A hot-rolled channel is rolled red-hot, is thicker and heavier, and carries larger loads.

Where can I find the section modulus of a roll-formed channel?

The table has Wx and Wy columns. Wx applies to a load in the plane of the web, Wy to a load in the perpendicular plane.

Reference information. Check the values against the current standard before using them in a project.