INTERNATIONAL STANDARD 1175

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Shipbuilding — Dimensions and sectional properties of aluminium alloy sections for marine use

Construction navale — Dimensions et caractéristiques des sections des profilés en alliages d'aluminium pour usage maritime

First edition — 1974-02-01

UDC 629.12 : 669.715—42

Ref. No. ISO 1175-1974 (E)

Descriptors : shipbuilding, sections, aluminium alloys, dimensions, cross sections, linear density, materials specifications.

Price based on 6 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 8 has reviewed ISO Recommendation R 1175 and found it suitable for transformation. International Standard ISO 1175 therefore replaces ISO Recommendation R 1175-1970.

ISO Recommendation R 1175 was approved by the Member Bodies of the following countries :

Australia	India	Poland
Belgium	Israel	Spain
Czechoslovakia	Italy	Sweden
Egypt, Arab Rep. of	Japan	Thailand
France	Netherlands	Turkey
Germany	New Zealand	United Kingdom
Greece	Norway	Yugoslavia

The Member Body of the following country has subsequently approved this Recommendation :

Philippines

The Member Body of the following country expressed disapproval of the Recommendation on technical grounds :

U.S.S.R.

The Member Body of the following country disapproved the transformation of ISO/R 1175 into an International Standard :

U.S.S.R.

Printed in Switzerland

Shipbuilding — Dimensions and sectional properties of aluminium alloy sections for marine use

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies dimensions, sectional properties and masses per unit length of aluminium alloy sections, with and without welding flange, for marine use.

2 CLASSIFICATION

The dimensions, sectional properties and masses per unit length of the following aluminium alloy sections are given in clause 3 :

- tee bars without welding flange;
- tee bars with welding flange;
- bulb plates without welding flange;
- bulb plates with welding flange;
- bulb angles.

3 DIMENSIONS, SECTIONAL PROPERTIES AND MASSES PER UNIT LENGTH

The calculated masses in kilograms per metre, shown in the tables, are based on an average density of 2,65 kg/dm^3.

Where $e_{NA} > A$, the neutral axis lies in the plate.

Where $e_{NA} < \frac{A + t}{2}$, the neutral axis is closer to the outer face of the tee bar or bulb plate than to the upper face of the plate.

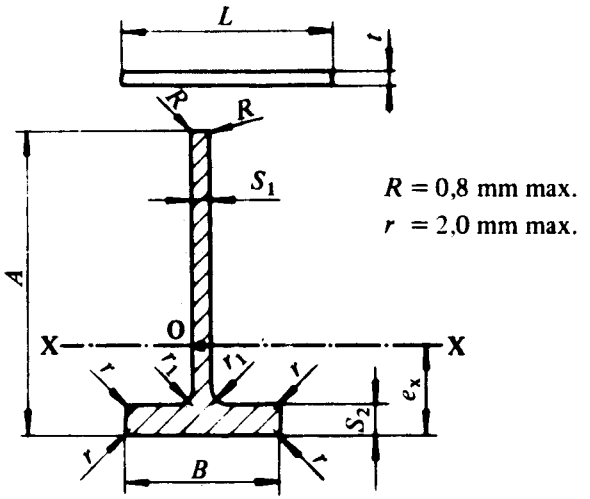
3.1 Tee bars without welding flange

Section without plate

F = sectional area
0 = centre of gravity
e_x = distance of centre of gravity from the outer face of the flange
G = mass
I_x = second moment of area

Section with plate

NA = neutral axis
e_{NA} = distance of centre of gravity of assembly from the outer face of the flange
= distance of neutral axis from the extreme outer fibres
I = second moment of area
$Z = \frac{I}{e_{NA}}$ = section modulus
t = plate thickness : 5, 10 or 15 mm
L = 40 t



R = 0,8 mm max.
r = 2,0 mm max.

Dimensions					Mass (without plate)	Sectional properties											
						Section without plate			Section with plate								
									$L \times t$: 200 mm × 5 mm			$L \times t$: 400 mm × 10 mm			$L \times t$: 600 mm × 15 mm		
A	B	S_1	S_2	r_1	G	F	e_x	I_x	e_{NA}	I	Z	e_{NA}	I	Z	e_{NA}	I	Z
mm	mm	mm	mm	mm	kg/m	cm^2	cm	cm^4	cm	cm^4	cm^3	cm	cm^4	cm^3	cm	cm^4	cm^3
80	40	4,0	8,0	6,0	1,642	6,197	2,27	36,9	5,96	174,0	29,2	7,66	248,6	32,4	8,33	297,4	35,7
90	45	4,0	9,0	6,0	1,963	7,407	2,43	54,5	6,35	252,8	39,8	8,39	370,5	44,1	9,19	438,4	47,7
100	50	4,0	10,0	6,0	2,310	8,717	2,57	77,1	6,67	351,8	52,7	9,08	530,1	58,4	10,03	625,3	62,4
110	55	4,0	11,0	6,0	2,684	10,127	2,71	105,3	6,95	472,7	68,0	9,72	733,3	75,4	10,84	866,4	80,0
120	60	4,0	12,0	6,0	3,084	11,637	2,83	140,0	7,19	617,0	85,9	10,32	985,5	95,5	11,61	1 170,1	100,7
130	65	4,5	13,0	7,0	3,680	13,888	3,12	198,4	7,36	794,7	107,9	10,83	1 311,6	121,2	12,33	1 573,8	127,6
140	70	5,0	14,0	7,5	4,321	16,304	3,42	273,1	7,53	1 000,9	132,8	11,29	1 699,6	150,5	13,01	2 063,4	158,6
150	75	5,0	15,0	7,5	4,824	18,204	3,54	342,1	7,69	1 227,3	159,5	11,76	2 134,7	181,5	13,70	2 616,0	191,0
160	80	5,5	16,0	8,5	5,563	20,993	3,83	453,3	7,84	1 498,2	191,2	12,14	2 666,4	219,7	14,31	3 311,3	231,5
170	85	6,0	17,0	9,0	6,344	23,941	4,12	589,0	7,99	1 804,8	225,9	12,49	3 272,5	262,0	14,89	4 117,6	276,6
180	90	6,0	18,0	9,0	6,951	26,231	4,25	709,9	8,11	2 129,5	262,5	12,86	3 931,1	305,8	15,48	4 998,4	323,0
190	95	6,5	19,0	10,0	7,833	29,557	4,54	898,6	8,26	2 516,1	304,7	13,14	4 707,0	358,2	15,99	6 064,3	379,3
200	100	7,0	20,0	10,5	8,755	33,036	4,83	1 121,9	8,41	2 947,4	350,3	13,41	5 567,9	415,1	16,48	7 263,4	440,9
220	110	7,5	22,0	11,0	10,476	39,532	5,25	1 611,2	8,68	3 918,4	451,4	13,92	7 531,9	540,9	17,41	10 041,6	576,8
240	120	8,0	24,0	12,0	12,365	46,661	5,66	2 244,8	8,94	5 090,4	569,2	14,36	9 891,0	688,9	18,23	13 457,9	738,1
260	130	9,0	26,0	13,5	14,735	55,605	6,24	3 179,7	9,29	6 571,9	707,1	14,72	12 727,7	864,7	18,92	17 647,8	932,8

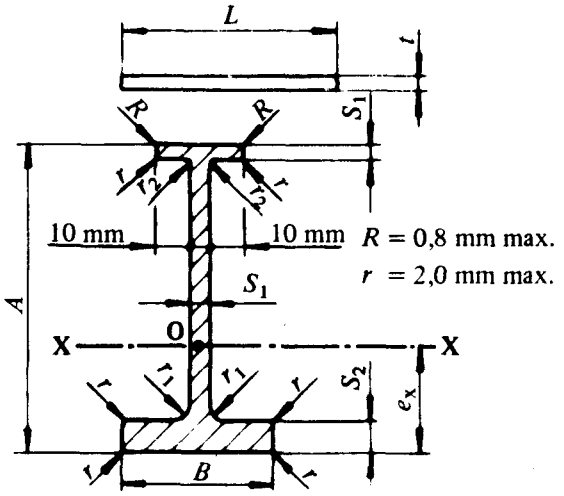
3.2 Tee bars with welding flange

Section without plate

F = sectional area
0 = centre of gravity
e_x = distance of centre of gravity from the outer face of the flange
G = mass
I_x = second moment of area

Section with plate

NA = neutral axis
e_{NA} = distance of centre of gravity of assembly from the outer face of the flange
= distance of neutral axis from the extreme outer fibres
I = second moment of area
$Z = \frac{I}{e_{NA}}$ = section modulus
t = plate thickness : 5, 10 or 15 mm
L = 40 t



Dimensions						Mass (without plate)	Sectional properties											
							Section without plate			Section with plate								
										$L \times t$: 200 mm × 5 mm			$L \times t$: 400 mm × 10 mm			$L \times t$: 600 mm × 15 mm		
A	B	S_1	S_2	r_1	r_2	G	F	e_x	I_x	e_{NA}	I	Z	e_{NA}	I	Z	e_{NA}	I	Z
mm	mm	mm	mm	mm	mm	kg/m	cm²	cm	cm⁴	cm	cm⁴	cm³	cm	cm⁴	cm³	cm	cm⁴	cm³
80	40	4,0	8,0	6,0	4,0	1,868	7,049	2,93	59,7	6,05	176,7	29,2	7,67	248,6	32,4	8,33	297,6	35,7
90	45	4,0	9,0	6,0	4,0	2,189	8,259	3,08	85,3	6,46	257,6	39,9	8,40	370,6	44,1	9,19	438,5	47,7
100	50	4,0	10,0	6,0	4,0	2,536	9,569	3,21	117,4	6,81	359,6	52,8	9,09	530,6	58,3	10,03	625,4	62,4
110	55	4,0	11,0	6,0	4,0	2,909	10,979	3,33	156,5	7,11	484,7	68,2	9,74	734,3	75,4	10,83	866,4	80,0
120	60	4,0	12,0	6,0	4,0	3,310	12,489	3,44	203,5	7,36	634,3	86,2	10,35	987,3	95,4	11,62	1 170,1	100,7
130	65	4,5	13,0	7,0	4,5	3,937	14,858	3,75	282,4	7,57	821,8	108,5	10,86	1 315,2	121,1	12,33	1 574,0	127,6
140	70	5,0	14,0	7,5	5,0	4,610	17,394	4,06	381,6	7,78	1 041,0	133,8	11,34	1 706,0	150,5	13,02	2 064,0	158,5
150	75	5,0	15,0	7,5	5,0	5,113	19,294	4,17	470,7	7,95	1 279,1	160,8	11,81	2 144,1	181,5	13,71	2 617,2	191,0
160	80	5,5	16,0	8,5	5,5	5, 885	22,206	4,48	614,4	8,13	1 570,1	193,0	12,21	2 681,4	219,6	14,32	3 313,6	231,4
170	85	6,0	17,0	9,0	6,0	6,699	25,278	4,79	788,0	8,32	1 901,4	228,6	12,58	3 295,2	262,0	14,91	4 121,8	276,5
180	90	6,0	18,0	9,0	6,0	7,305	27,568	4,90	938,6	8,45	2 247,0	265,8	12,95	3 961,3	305,9	15,50	5 004,7	322,8
190	95	6,5	19,0	10,0	6,5	8,221	31,021	5,20	1 175,3	8,63	2 667,8	309,2	13,26	4 750,2	358,4	16,02	6 074,4	379,2
200	100	7,0	20,0	10,5	7,0	9,177	34,629	5,51	1 453,0	8,81	3 139,3	356,3	13,54	5 627,5	415,5	16,52	7 278,7	440,7
220	110	7,5	22,0	11,0	7,5	10,933	41,257	5,93	2 050,5	9,11	4 194,6	460,2	14,09	7 630,2	541,7	17,46	10 070,9	576,7
240	120	8,0	24,0	12,0	8,0	12,857	48,518	6,35	2 814,5	9,41	5 472,6	581,9	14,55	10 043,8	690,3	18,30	13 509,2	738,1
260	130	9,0	26,0	13,5	9,0	15,300	57,736	6,95	3 936,5	9,80	7 110,6	725,4	14,95	12 967,8	867,2	19,01	17 737,5	932,9

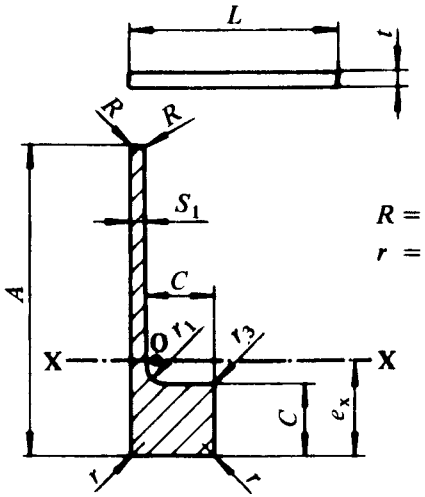
3.3 Bulb plates without welding flange

Section without plate

F = sectional area
0 = centre of gravity
e_x = distance of centre of gravity from the outer face of the bulb
G = mass
I_x = second moment of area

Section with plate

NA = neutral axis
e_{NA} = distance of centre of gravity of assembly from the outer face of the bulb
= distance of neutral axis from the extreme outer fibres
I = second moment of area
$Z = \frac{I}{e_{NA}}$ = section modulus
t = plate thickness : 5, 10 or 15 mm
L = 40 t



R = 0,8 mm max.
r = 2,0 mm max.

Dimensions					Mass (without plate)	Sectional properties											
						Section without plate			Section with plate								
									$L \times t$: 200 mm × 5 mm			$L \times t$: 400 mm × 10 mm			$L \times t$: 600 mm × 15 mm		
A	C	S_1	r_1	r_3	G	F	e_x	I_x	e_{NA}	I	Z	e_{NA}	I	Z	e_{NA}	I	Z
mm	mm	mm	mm	mm	kg/m	cm²	cm	cm⁴	cm	cm⁴	cm³	cm	cm⁴	cm³	cm	cm⁴	cm³
50	12	3,5	4,5	3,0	0,852	3,214	1,67	6,79	4,38	38,25	8,74	5,21	53,86	10,33	5,61	75,43	13,45
60	14	3,5	4,5	3,0	1,082	4,084	1,91	12,18	4,99	66,95	13,41	6,07	93,51	15,39	6,54	120,49	18,42
70	16	3,5	4,5	3,0	1,334	5,034	2,14	19,97	5,54	107,55	19,41	6,90	151,68	21,98	7,45	186,79	25,06
80	18	4,0	5,5	3,0	1,713	6,466	2,44	33,24	5,97	165,94	27,80	7,66	240,89	31,46	8,33	290,20	34,85
90	20	4,5	6,0	3,0	2,143	8,088	2,76	53,11	6,35	241,63	38,06	8,37	362,02	43,27	9,17	432,53	47,15
100	22	4,5	6,0	4,0	2,481	9,363	2,98	74,64	6,73	330,41	49,06	9,07	507,01	55,88	10,02	603,50	60,24
110	24	5,0	7,0	4,0	2,997	11,311	3,30	109,93	7,03	445,63	63,39	9,69	706,22	72,86	10,81	844,34	78,13
120	26	5,0	7,5	4,0	3,399	12,826	3,51	145,65	7,34	575,24	78,39	10,32	934,18	90,55	11,60	1 121,32	96,69
130	28	5,5	8,5	4,0	3,999	15,091	3,83	202,67	7,58	736,68	97,14	10,85	1 230,77	113,43	12,33	1 491,55	121,01
140	30	6,0	9,0	4,0	4,643	17,520	4,15	274,93	7,82	924,48	118,21	11,35	1 583,22	139,52	13,02	1 939,35	148,92
150	32	6,0	9,0	4,5	5,128	19,350	4,30	343,69	8,07	1 126,28	139,60	11,87	1 966,51	165,72	13,73	2 428,01	176,79
160	34	6,5	10,0	4,5	5,859	22,111	4,68	449,73	8,28	1 731,99	165,66	12,29	2 443,13	198,77	14,37	3 053,32	212,49
170	36	7,0	10,5	4,5	6,634	25,033	5,00	578,48	8,50	1 650,83	194,28	12,69	2 987,32	235,43	14,98	3 778,84	252,33
180	38	7,5	11,5	4,5	7,463	28,160	5,32	733,01	8,71	1 966,54	225,78	13,06	3 606,14	276,21	15,55	4 617,27	296,93
200	42	8,0	12,0	4,5	8,980	33,886	5,85	1 082,22	9,13	2 683,79	293,94	13,78	5 023,42	364,53	16,67	6 565,21	393,75
220	46	9,0	13,5	4,5	10,941	41,288	6,49	1 609,57	9,57	3 608,23	377,19	14,37	6 817,83	474,44	17,64	9 105,72	516,26

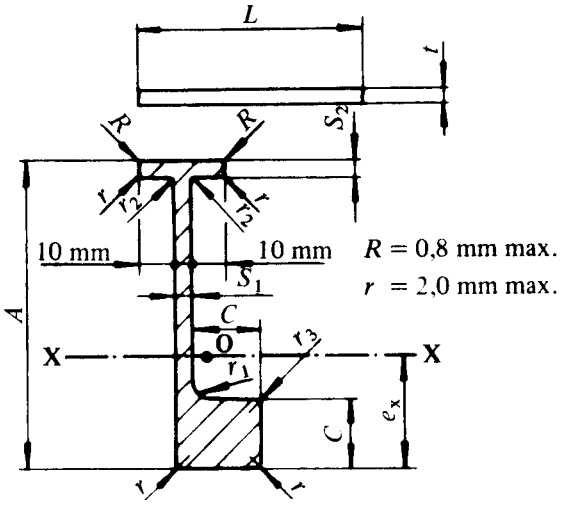
3.4 Bulb plates with welding flange

Section without plate

F = sectional area
0 = centre of gravity
e_x = distance of centre of gravity from the outer face of the bulb
G = mass
I_x = second moment of area

Section with plate

NA = neutral axis
e_{NA} = distance of centre of gravity of assembly from the outer face of the bulb
= distance of neutral axis from the extreme outer fibres
I = second moment of area
$Z = \frac{I}{e_{NA}}$ = section modulus
t = plate thickness : 5, 10 or 15 mm
L = 40 t



Dimensions							Mass (without plate)	Sectional properties											
								Section without plate			Section with plate								
											$L \times t$: 200 mm × 5 mm			$L \times t$: 400 mm × 10 mm			$L \times t$: 600 mm × 15 mm		
A	C	S_1	S_2	r_1	r_2	r_3	G	F	e_x	I_x	e_{NA}	I	Z	e_{NA}	I	Z	e_{NA}	I	Z
mm	mm	mm	mm	mm	mm	mm	kg/m	cm²	cm	cm⁴	cm	cm⁴	cm³	cm	cm⁴	cm³	cm	cm⁴	cm³
50	12	3,5	4,0	4,5	3,5	3,0	1,068	4,030	2,30	13,14	4,40	38,39	8,72	5,21	54,02	10,37	5,60	75,99	13,56
60	14	3,5	4,0	4,5	3,5	3,0	1,298	4,900	2,56	22,39	5,04	67,45	13,40	6,07	93,59	15,42	6,53	120,97	18,51
70	16	3,5	4,0	4,5	3,5	3,0	1,550	5,850	2,79	35,12	5,60	108,77	19,41	6,90	151,70	21,99	7,45	187,16	25,13
80	18	4,0	4,0	5,5	4,0	3,0	1,939	7,317	3,06	54,70	6,06	168,61	27,83	7,66	240,92	31,45	8,32	290,45	34,90
90	20	4,5	4,5	6,0	4,5	3,0	2,400	9,058	3,40	84,18	6,47	246,95	38,17	8,37	362,18	43,25	9,17	432,72	47,19
100	22	4,5	4,5	6,0	4,5	4,0	2,738	10,333	3,62	114,93	6,88	338,82	49,26	9,09	507,46	55,85	10,02	603,59	60,27
110	24	5,0	5,0	7,0	5,0	4,0	3,286	12,401	3,95	164,67	7,21	459,76	63,77	9,71	707,37	72,82	10,81	844,38	78,14
120	26	5,0	5,0	7,5	5,0	4,0	3,688	13,917	4,15	213,40	7,54	595,23	78,97	10,35	936,31	90,51	11,60	1 121,37	96,68
130	28	5,5	5,5	8,5	5,5	4,0	4,320	16,303	4,49	390,76	7,82	766,83	98,07	10,89	1 234,81	113,38	12,33	1 491,75	120,99
140	30	6,0	6,0	9,0	6,0	4,0	4,997	18,857	4,82	387,19	8,09	967,92	119,63	11,40	1 590,23	139,49	13,03	1 939,94	148,88
150	32	6,0	6,0	9,0	6,0	4,5	5,482	20,688	5,02	476,37	8,35	1 181,81	141,45	11,93	1 976,72	165,72	13,74	2 429,19	176,73
160	34	6,5	6,5	10,0	6,5	4,5	6,247	23,575	5,36	614,22	8,60	1 447,48	168,27	12,37	2 459,06	198,82	14,39	3 055,66	212,42
170	36	7,0	7,0	10,5	7,0	4,5	7,056	26,626	5,69	779,63	8,85	1 750,65	197,83	12,78	3 011,05	235,57	15,00	3 783,02	252,24
180	38	7,5	7,5	11,5	7,5	4,5	7,919	29,885	6,03	976,17	9,09	2 095,65	230,49	13,17	3 640,28	276,48	15,58	4 624,22	296,83
200	42	8,0	8,0	12,0	8,0	4,5	9,472	35,743	6,56	1 411,40	9,55	2 876,23	301,11	13,92	5 083,22	365,14	16,72	6 580,17	393,64
220	46	9,0	9,0	13,5	9,0	4,5	11,506	43,418	7,23	2 062,80	10,04	3 897,20	388,17	14,55	6 922,04	475,71	17,70	9 136,38	516,22