

# INTERNATIONAL STANDARD

# ISO 657-2

First edition  
1989-08-01

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**Hot-rolled steel sections —**

**Part 2 :  
Unequal-leg angles — Dimensions**

*Profilés en acier laminés à chaud —*

*Partie 2: Cornières à ailes inégales — Dimensions*



Reference number  
ISO 657-2 : 1989 (E)

**ISO 657-2 : 1989 (E)****Foreword**

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 657-2 was prepared by Technical Committee ISO/TC 17, *Steel*.

It cancels and replaces ISO Recommendation R 657-2 : 1968, of which it constitutes a technical revision.

ISO 657 consists of the following parts, under the general title *Hot-rolled steel sections*:

- *Part 1: Equal-leg angles — Dimensions*
- *Part 2: Unequal-leg angles — Dimensions*
- *Part 5: Equal-leg angles and unequal-leg angles — Tolerances for metric and inch series*
- *Part 6: Parallel flange sections (metric series) — Dimensions*
- *Part 10: Parallel flange sections — Tolerances*
- *Part 11: Sloping flange channel sections (metric series) — Dimensions and sectional properties*
- *Part 13: Tolerances on sloping flange beam, column and channel sections*
- *Part 15: Sloping flange beam sections (metric series) — Dimensions and sectional properties*
- *Part 16: Sloping flange column sections (metric series) — Dimensions and sectional properties*
- *Part 18: L sections for shipbuilding (metric series) — Dimensions, sectional properties and tolerances*
- *Part 19: Bulb flats (metric series) — Dimensions, sectional properties and tolerances*
- *Part 20: Parallel flange channel sections — Dimensions*
- *Part 21: T-sections with equal depth and flange width — Dimensions*

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## Hot-rolled steel sections —

### Part 2: Unequal-leg angles — Dimensions

#### 1 Scope

This part of ISO 657 specifies dimensions of hot-rolled unequal-leg angles.

#### 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 657. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 657 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 657-5 : 1976, *Hot-rolled steel sections — Part 5 : Equal-leg angles and unequal-leg angles — Tolerances for metric and inch series.*

#### 3 Dimensions

**3.1** The dimensions of unequal-leg angles are given in table 1. Preferred dimensions are given in bold type.

**3.2** The root radii given in table 1 are for information only.

**3.3** The toe radius has not been specified and may, if considered necessary, be determined independently for national standards.

#### 4 Sectional properties

The mass, sectional area and sectional properties of unequal-leg angles are given for information in table 1. They have been calculated assuming a toe radius equal to half the root radius.

#### 5 Dimensional tolerances

Tolerances on the dimensions specified in table 1 are covered in ISO 657-5.

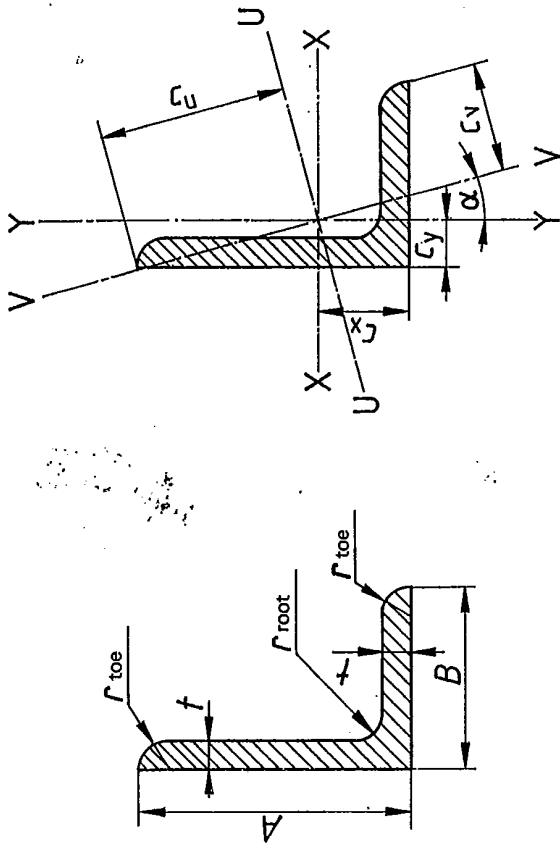


Table 1 — Dimensions and sectional properties of hot-rolled unequal-leg angles

Designation	Mass kg/m	Sectional area cm <sup>2</sup>	Dimensions				Distances of centre of gravity				Sectional properties about axes								Incli- nation of V-V axis tan $\alpha$		
			A mm	B mm	t mm	r <sub>root</sub> mm	C <sub>x</sub> cm	C <sub>y</sub> cm	C <sub>u</sub> cm	C <sub>v</sub> cm	I <sub>x</sub> cm <sup>4</sup>	r <sub>x</sub> cm	Z <sub>x</sub> cm <sup>3</sup>	I <sub>y</sub> cm <sup>4</sup>	r <sub>y</sub> cm	Z <sub>y</sub> cm <sup>3</sup>	I <sub>u</sub> cm <sup>4</sup>	r <sub>u</sub> cm		I <sub>v</sub> cm <sup>4</sup>	r <sub>v</sub> cm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
30 × 20 × 3	1,12	1,43	30	20	3	4	0,990	0,502	2,05	1,04	1,25	0,935	0,621	0,437	0,553	0,292	1,43	1,00	0,256	0,424	0,427
30 × 20 × 4	1,46	1,86	30	20	4	4	1,03	0,541	2,02	1,04	1,59	0,925	0,807	0,553	0,546	0,379	1,81	0,988	0,330	0,421	0,421
40 × 20 × 4	1,77	2,26	40	20	4	4	1,47	0,48	2,58	1,17	3,59	1,26	1,42	0,600	0,514	0,393	3,80	1,30	0,393	0,417	0,252
40 × 25 × 4	1,93	2,46	40	25	4	4	1,36	0,623	2,69	1,35	3,89	1,26	1,47	1,16	0,687	0,619	4,35	1,33	0,700	0,534	0,380
45 × 30 × 5	2,76	3,52	45	30	5	4	1,52	0,779	3,04	1,58	6,98	1,41	2,35	2,47	0,837	1,11	8,00	1,51	1,45	0,641	0,429
50 × 30 × 4	2,41	3,07	50	30	4	5	1,68	0,701	3,36	1,67	7,71	1,59	2,33	2,09	0,825	0,907	8,53	1,67	1,27	0,644	0,356
50 × 30 × 5	2,96	3,78	50	30	5	5	1,73	0,741	3,33	1,65	9,36	1,57	2,86	2,51	0,816	1,11	10,3	1,65	1,54	0,639	0,352
50 × 40 × 5	3,36	4,28	50	40	5	5	1,55	1,06	3,49	1,85	10,3	1,55	3,00	5,85	1,17	1,99	13,2	1,75	3,03	0,842	0,621
60 × 30 × 5	3,36	4,28	60	30	5	5	2,17	0,684	3,88	1,77	15,6	1,91	4,07	2,63	0,784	1,14	16,5	1,97	1,71	0,633	0,257
60 × 30 × 6	3,98	5,07	60	30	6	5	2,21	0,723	3,85	1,76	18,2	1,90	4,81	3,05	0,776	1,34	19,3	1,95	2,01	0,630	0,253

Table 1 — Dimensions and sectional properties of hot-rolled unequal-leg angles (continued)

Designation	Mass kg/m	Sectional area cm <sup>2</sup>	Dimensions				Distances of centre of gravity						Sectional properties about axes								Incli- nation of V-V axis tan $\alpha$ (22)		
			A		B		t	r <sub>root</sub>	c <sub>x</sub>	c <sub>y</sub>	c <sub>x</sub> - c <sub>y</sub>	c <sub>v</sub>	X-X			Y-Y			U-U			V-V	
			mm	mm	mm	mm							I <sub>x</sub>	r <sub>x</sub>	Z <sub>x</sub>	I <sub>y</sub>	r <sub>y</sub>	Z <sub>y</sub>	I <sub>u</sub>	r <sub>u</sub>		I <sub>v</sub>	r <sub>v</sub>
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)						
60 x 40 x 5	3,76	4,79	60	40	5	6	1,96	0,972	4,10	2,11	17,2	1,89	4,25	6,11	1,13	2,02	19,7	2,03	3,54	0,86	0,434		
60 x 40 x 6	4,46	5,68	60	40	6	6	2,00	1,01	4,08	2,10	20,1	1,88	5,03	7,12	1,12	2,38	23,1	2,02	4,16	0,855	0,431		
60 x 50 x 6	4,93	6,28	60	50	6	6	1,84	1,34	4,20	2,22	21,7	1,86	5,22	13,7	1,47	3,73	28,5	2,13	6,84	1,04	0,677		
60 x 50 x 8	6,44	8,20	60	50	8	6	1,91	1,42	4,18	2,24	27,7	1,84	6,77	17,3	1,45	4,84	36,2	2,10	8,81	1,04	0,672		
65 x 50 x 5	4,35	5,54	65	50	5	6	1,99	1,25	4,53	2,39	23,2	2,05	5,14	11,9	1,47	3,19	28,8	2,28	6,32	1,07	0,577		
65 x 50 x 6	5,16	6,58	65	50	6	6	2,04	1,29	4,52	2,39	27,2	2,03	6,10	14,0	1,46	3,77	33,8	2,27	7,43	1,06	0,575		
65 x 50 x 8	6,75	8,60	65	50	8	6	2,11	1,37	4,49	2,39	34,8	2,01	7,93	17,7	1,44	4,89	43,0	2,23	9,57	1,05	0,569		
70 x 50 x 6	5,41	6,89	70	50	6	7	2,23	1,25	4,83	2,52	33,4	2,20	7,01	14,2	1,43	3,78	39,7	2,40	7,92	1,07	0,500		
70 x 50 x 7	6,25	7,96	70	50	7	7	2,27	1,29	4,81	2,52	38,2	2,19	8,08	16,0	1,42	4,35	45,3	2,39	9,06	1,07	0,493		
75 x 50 x 6	5,65	7,19	75	50	6	7	2,44	1,21	5,12	2,64	40,5	2,37	8,01	14,4	1,42	3,81	46,6	2,55	8,36	1,08	0,435		
75 x 50 x 8	7,39	9,41	75	50	8	7	2,52	1,29	5,08	2,62	52,0	2,35	10,4	18,4	1,40	4,95	59,6	2,52	10,8	1,07	0,430		
80 x 40 x 6	5,41	6,89	80	40	6	7	2,85	0,884	5,20	2,38	44,9	2,55	8,73	7,59	1,05	2,44	47,6	2,63	4,93	0,845	0,258		
80 x 40 x 8	7,07	9,01	80	40	8	7	2,94	0,963	5,14	2,34	57,6	2,53	11,4	9,61	1,03	3,16	60,9	2,60	6,34	0,838	0,253		
80 x 60 x 6	6,37	8,11	80	60	6	8	2,47	1,48	5,57	2,92	51,4	2,52	9,29	24,8	1,75	5,49	62,8	2,78	13,4	1,29	0,547		
80 x 60 x 7	7,36	9,38	80	60	7	8	2,51	1,52	5,55	2,92	59,0	2,51	10,7	28,4	1,74	6,34	72,0	2,77	15,4	1,28	0,546		
80 x 60 x 8	8,34	10,6	80	60	8	8	2,55	1,56	5,53	2,92	66,3	2,50	12,2	31,8	1,73	7,16	80,8	2,76	17,3	1,27	0,544		
90 x 60 x 8	8,97	11,4	90	60	8	8	2,96	1,48	6,13	3,16	92,3	2,84	15,3	32,8	1,70	7,27	106	3,05	19,0	1,29	0,434		
90 x 65 x 6	7,07	9,01	90	65	6	8	2,79	1,56	6,24	3,27	73,4	2,85	11,8	32,3	1,89	6,53	87,9	3,12	17,8	1,41	0,510		
90 x 65 x 8	9,29	11,8	90	65	8	8	2,88	1,64	6,20	3,26	94,9	2,83	15,5	41,5	1,87	8,54	113	3,10	23,0	1,39	0,507		
90 x 75 x 8	9,91	12,6	90	75	8	8	2,72	1,98	6,31	3,35	99,5	2,81	15,8	62,7	2,23	11,4	131	3,22	31,2	1,57	0,679		
90 x 75 x 10	12,2	15,6	90	75	10	8	2,80	2,06	6,29	3,35	121	2,79	19,5	75,8	2,21	13,9	159	3,19	38,1	1,56	0,676		
90 x 75 x 13	15,6	19,8	90	75	13	8	2,91	2,17	6,26	3,38	150	2,75	24,6	93,7	2,17	17,6	196	3,14	47,9	1,55	0,670		
100 x 50 x 6	6,84	8,71	100	50	6	8	3,51	1,05	6,55	3,00	89,9	3,21	13,8	15,4	1,33	3,89	95,4	3,31	9,92	1,07	0,262		
100 x 50 x 8	8,97	11,4	100	50	8	8	3,60	1,13	6,48	2,96	116	3,19	18,2	19,7	1,31	5,08	123	3,28	12,8	1,06	0,258		
100 x 50 x 10	11,0	14,1	100	50	10	8	3,68	1,21	6,42	2,93	141	3,16	22,3	23,6	1,29	6,21	149	3,25	15,5	1,05	0,253		
100 x 65 x 7	8,77	11,2	100	65	7	10	3,23	1,51	6,83	3,49	113	3,17	16,6	37,6	1,83	7,53	128	3,39	22,0	1,40	0,415		
100 x 65 x 8	9,94	12,7	100	65	8	10	3,27	1,55	6,81	3,47	127	3,16	18,9	42,2	1,83	8,54	144	3,37	24,8	1,40	0,413		
100 x 65 x 10	12,3	15,6	100	65	10	10	3,36	1,63	6,76	3,45	154	3,14	23,2	51,0	1,81	10,5	175	3,35	30,1	1,39	0,410		
100 x 75 x 8	10,6	13,5	100	75	8	10	3,10	1,87	6,95	3,65	133	3,14	19,3	64,1	2,18	11,4	162	3,47	34,6	1,60	0,547		
100 x 75 x 10	13,0	16,6	100	75	10	10	3,19	1,95	6,92	3,65	162	3,12	23,8	77,6	2,16	14,0	197	3,45	42,2	1,59	0,544		
100 x 75 x 12	15,4	19,7	100	75	12	10	3,27	2,03	6,89	3,65	189	3,10	28,0	90,2	2,14	16,5	230	3,42	49,5	1,59	0,540		



## NOTES

1 Member countries may choose, to be included in their national standards, the sizes which are required to meet their demand. For the angles so chosen, only thicknesses which can be rolled in their mills to meet the demand of the users may be selected from the list of thicknesses corresponding to unequal angles in table 1.

2 The sectional area has been calculated using the formula

$$S = [l(A + B - l) + 0,2146 (r_{\text{root}}^2 - 2r_{\text{toe}}^2)] \times \frac{1}{100}$$

where

$S$  is the sectional area, in square centimetres;

$l$  is the thickness, in millimetres;

$r_{\text{root}}$  is the root radius, in millimetres;

$r_{\text{toe}}$  is the toe radius, in millimetres;

$A$  and  $B$  are the leg lengths, in millimetres.

3 Mass is calculated on the basis of density of steel of 7,85 kg/dm<sup>3</sup>.

ISO 657-2: 1989 (E)

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**UDC 669.14-122.4-423.2**

\* **Descriptors :** steel products, hot rolled products, metal sections, angle irons, dimensions.

Price based on 5 pages

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