UDC 669.14.122.4-423.2

March 1994

Hot rolled equal angles with rounded toes

Dimensions, mass and static parameters

DIN 1028

Warmgewalzter gleichschenkliger rundkantiger Winkelstahl; Maße, Gewichte, statische Werte

This standard, together with DIN EN 10 056 Part 2, supersedes October 1976 edition.

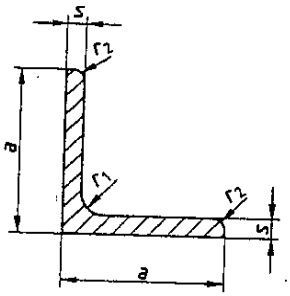
In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

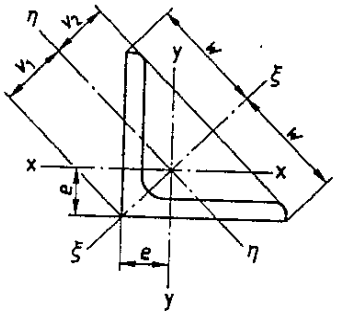
Dimensions in mm

1 Scope and field of application

This standard specifies requirements for hot rolled equal angles with rounded toes, with the dimensions and static parameters specified in table 1 and preferably made from DIN EN 10 025 steel.

2 Designation





The standard designation shall give, in the following order:

a) name of product (angle);
b) DIN number (DIN 1028);
c) material designation or number;
d) characteristic dimensions (leg length × leg thickness).

EXAMPLE:

An equal angle complying with this standard, made from steel grade S235JO (material number 1.0114) as specified in DIN EN 10 025, with a leg length, *a*, of 80 mm and a leg thickness, *s*, of 8 mm shall be designated:

Angle DIN 1028 – S235JO – 80 × 8

or Angle DIN 1028 – 1.0114 – 80 × 8

3 Dimensions and mass

3.1 Hot rolled angles shall have the dimensions specified in table 1. The preferred angle sizes are marked with a shaded upper left-hand corner, it being recommended that other sizes be ordered only when the application necessitates their use. The sizes given in parentheses shall also be avoided where possible.

3.2 The nominal leg length shall be specified at the time of ordering.

3.3 The values of mass specified in table 1 have been calculated taking the density as 7,85 kg/dm³.

Continued on pages 2 to 4.

Table 1: Dimensions and static parameters

Angle size (symbol) [1]	a	s	r_1	r_2	Section area[2], in cm^2	Mass, in kg/m	Surface area, in m^2/m	Distance of centre of gravity				Static parameters[3]								
												x – x = y – y			ζ – ζ		η – η			
								e cm	w cm	v_1 cm	v_2 cm	I_x cm^4	W_x cm^3	i_x cm	I_ζ cm^4	i_ζ cm	I_η cm^4	W_η cm^3	i_η cm
20 × 3	20	3	3,5	2	1,12	0,88	0,077	0,60	1,41	0,85	0,70	0,39	0,28	0,59	0,62	0,74	0,15	0,18	0,37
25 × 3	25	3	3,5	2	1,42	1,12	0,097	0,73	1,77	1,03	0,87	0,79	0,45	0,75	1,27	0,95	0,31	0,30	0,47
25 × 4		4			1,85	1,45		0,76		1,08	0,89	1,01	0,58	0,74	1,61	0,93	0,40	0,37	0,47
30 × 3	30	3	5	2,5	1,74	1,36	0,116	0,84	2,12	1,18	1,04	1,41	0,65	0,90	2,24	1,14	0,57	0,48	0,57
30 × 4		4			2,27	1,78		0,89		1,24	1,05	1,81	0,86	0,89	2,85	1,12	0,76	0,61	0,58
(30 × 5)		5			2,78	2,18		0,92		1,30	1,07	2,16	1,04	0,88	3,41	1,11	0,91	0,70	0,57
35 × 4	35	4	5	2,5	2,67	2,1	0,136	1,00	2,47	1,41	1,24	2,96	1,18	1,05	4,68	1,33	1,24	0,88	0,68
35 × 5		5			3,28	2,57		1,04		1,47	1,25	3,56	1,45	1,04	5,63	1,31	1,49	1,10	0,67
40 × 4	40	4	6	3	3,08	2,42	0,155	1,12	2,83	1,58	1,40	4,48	1,55	1,21	7,09	1,52	1,86	1,18	0,78
40 × 5		5			3,79	2,97		1,16		1,64	1,42	5,43	1,91	1,20	8,64	1,51	2,22	1,35	0,77
45 × 4	45	4	7	3,5	3,49	2,74	0,174	1,23	3,18	1,75	1,57	6,43	1,97	1,36	10,2	1,71	2,68	1,53	0,88
45 × 5		5			4,3	3,38		1,28		1,81	1,58	7,83	2,43	1,35	12,4	1,70	3,25	1,80	0,87
50 × 5	50	5	7	3,5	4,8	3,77	0,194	1,40	3,54	1,98	1,76	11,0	3,05	1,51	17,4	1,90	4,59	2,32	0,98
50 × 6		6			5,69	4,47		1,45		2,04	1,77	12,8	3,61	1,50	20,4	1,89	5,24	5,27	0,96
50 × 7		7			6,56	5,15		1,49		2,11	1,78	14,6	4,15	1,49	23,1	1,88	6,02	2,85	0,96
(55 × 6)	55	6	8	4	6,31	4,95	0,213	1,56	3,89	2,21	1,94	17,3	4,40	1,66	27,4	2,08	7,24	3,28	1,07
60 × 5	60	5	8	4	5,82	4,57	0,233	1,64	4,24	2,32	2,11	19,4	4,45	1,82	30,7	2,30	8,03	3,46	1,17
60 × 6		6			6,91	5,42		1,69		2,39	2,11	22,8	5,29	1,82	36,1	2,29	9,43	3,95	1,17
60 × 8		8			9,03	7,09		1,77		2,50	2,14	29,1	6,88	1,80	46,1	2,26	12,1	4,84	1,16
65 × 7	65	7	9	4,5	8,7	6,83	0,252	1,85	4,60	2,62	2,29	33,4	7,18	1,96	53,0	2,47	13,8	5,27	1,26
(70 × 6)	70	6	9	4,5	8,13	6,38	0,272	1,93	4,95	2,73	2,46	36,9	7,27	2,13	58,5	2,68	15,3	5,60	1,37
70 × 7		7			9,4	7,38		1,97		2,79	2,47	42,4	8,43	2,12	67,1	2,67	17,6	6,31	1,37
70 × 9		9			11,9	9,34		2,05		2,90	2,50	52,6	10,6	2,10	83,1	2,64	22,0	7,59	1,36
75 × 7	75	7	10	5	10,1	7,94	0,291	2,09	5,30	2,95	2,63	52,4	9,67	2,28	83,6	2,88	21,1	7,15	1,45
75 × 8		8			11,5	9,03		2,13		3,01	2,65	58,9	11,0	2,26	93,3	2,85	24,4	8,11	1,46
80 × 6	80	6	10	5	9,35	7,34	0,311	2,17	5,66	3,07	2,80	55,8	9,57	2,44	88,5	3,08	23,1	7,54	1,57
80 × 8		8			12,3	9,66		2,26		3,20	2,82	72,3	12,6	2,42	115	3,06	29,6	9,25	1,55
80 × 10		10			15,1	11,9		2,34		3,31	2,85	87,5	15,5	2,41	139	3,03	35,9	10,9	1,54

For [1] to [3] see page 3.

The values specified for cross-sectional area, mass, surface area and static parameters have been specified as a function of the other dimensions.

(continued)

Table 1 (concluded)

Angle size (symbol) [1]	a	s	r_1	r_2	Section area [2], in cm^2	Mass, in kg/m	Surface area, in m^2/m	Distance of centre of gravity				Static parameters [3]							
												x – x = y – y			ξ – ξ		η – η		
								e cm	w cm	v_1 cm	v_2 cm	I_x cm^4	W_x cm^3	i_x cm	I_ξ cm^4	i_ξ cm	I_η cm^4	W_η cm^3	i_η cm
90 × 7	90	7	11	5,5	12,2	9,61	0,351	2,45	6,36	3,47	3,16	92,6	14,1	2,75	147	3,46	38,3	11,0	1,77
90 × 9		9			15,5	12,2		2,54		3,59	3,18	116	18,0	2,74	184	3,45	47,8	13,3	1,76
100 × 8	100	8	12	6	15,5	12,2	0,390	2,74	7,07	3,87	3,52	145	19,9	3,06	230	3,85	59,9	15,5	1,96
100 × 10		10			19,2	15,1		2,82		3,99	3,54	177	24,7	3,04	280	3,82	73,3	18,4	1,95
100 × 12		12			22,7	17,8		2,90		4,10	3,57	207	29,2	3,02	328	3,80	86,2	21,0	1,95
110 × 10	110	10	12	6	21,2	16,6	0,430	3,07	7,78	4,34	3,89	239	30,1	3,36	379	4,23	98,6	22,7	2,16
120 × 10	120	10	13	6,5	23,2	18,2	0,469	3,31	8,49	4,69	4,22	313	36,0	3,67	497	4,63	129	27,5	2,36
(120 × 11)		11			25,4	19,9		3,36		4,75	4,24	341	39,5	3,66	541	4,62	140	29,5	2,35
120 × 12		12			27,5	21,6		3,40		4,80	4,26	368	42,7	3,65	584	4,60	152	31,6	2,35
130 × 12	130	12	14	7	30	23,6	0,508	3,64	9,19	5,15	4,60	472	50,4	3,97	750	5,00	194	37,7	2,54
140 × 13	140	13	15	7,5	35	27,5	0,547	3,92	9,90	5,54	4,96	638	63,3	4,27	1 010	5,38	262	47,3	2,74
150 × 12	150	12	16	8	34,8	27,3	0,586	4,12	10,6	5,83	5,29	737	67,7	4,60	1 170	5,80	303	52,0	2,95
(150 × 14)		14			40,3	31,6		4,21		5,95	5,31	845	78,2	4,58	1 340	5,77	347	58,3	2,94
150 × 15		15			43	33,8		4,25		6,01	5,33	898	83,5	4,57	1 430	5,76	370	61,6	2,93
160 × 15	160	15	17	8,5	46,1	36,2	0,625	4,49	11,3	6,35	5,67	1 100	95,6	4,88	1 750	6,15	453	71,3	3,14
(160 × 17)		17			51,8	40,7		4,57		6,46	5,70	1 230	108	4,86	1 950	6,13	506	78,3	3,13
180 × 16	180	16	18	9	55,4	43,5	0,705	5,02	12,7	7,11	6,39	1 680	130	5,51	2 690	6,96	679	95,5	3,50
180 × 18		18			61,9	48,6		5,10		7,22	6,41	1 870	145	5,49	2 970	6,93	757	105	3,49
200 × 16	200	16	18	9	61,8	48,5	0,785	5,52	14,1	7,80	7,09	2 430	162	6,15	3 740	7,78	943	121	3,91
(200 × 18)		18			69,1	54,3		5,60		7,92	7,12	2 600	181	6,13	4 150	7,75	1 050	133	3,90
200 × 20		20			76,4	59,9		5,68		8,04	7,15	2 850	199	6,11	4 540	7,72	1 160	144	3,89
200 × 24		24			90,6	71,1		5,84		8,26	7,21	3 330	235	6,06	5 280	7,64	1 380	167	3,90

[1] The symbol indicates preferred sizes (cf. subclause 3.1).

[2] The cross-sectional area is equal to approximately $2a \cdot s - s^2 + 0{,}2146\,(r_1^2 - 2\,r_2^2)$.

[3] I = moment of inertia, W = section modulus, i = radius of gyration (subscripts x and y denoting the relevant axis).

The values specified for cross-sectional area, mass, surface area and static parameters have been specified as a function of the other dimensions.

4 Tolerances on shape and dimensions

The dimensions of angles are subject to the tolerances specified in DIN EN 10 056 Part 2.

5 Material

Angles shall preferably be made from DIN EN 10 025 steel, the particular steel grade being specified at the time of ordering.

Standards referred to

DIN EN 10 025	Hot rolled unalloyed structural steel products; technical delivery conditions
DIN EN 10 056 Part 2	Hot rolled equal and unequal leg angles; tolerances on shape and dimensions

Other relevant standards

DIN 1022	Hot rolled equal angles with square-edged toes; dimensions, masses and permissible deviations
DIN 1029	Hot rolled unequal angles with rounded toes; dimensions, mass and static parameters
DIN 59 370	Bright steel angles with equal legs and square edges; dimensions, tolerances and mass

Previous editions

DIN 1612: 09.24, 01.32, 03.43x; DIN 1028 Part 1: 07.26, 07.40x; DIN 1028 Part 2: 07.26, 07.40xx; DIN 1028: 07.59, 10.63x, 10.76

Amendments

In comparison with the October 1976 edition, the following amendments have been made.

a) All specifications with regard to tolerances have been deleted, a reference being made instead to DIN EN 10 056 Part 2.

b) The references to standards have been updated.

Explanatory notes

With the publication of European Standard EN 10 056-2, it became necessary to revise the DIN Standards on equal and unequal steel angles. Since the European Standard deals with tolerances on shape and dimensions, the scope of the present standard has been restricted to nominal sizes and the associated static parameters, these having been taken without revision from the previous edition. At the European level, ECISS/TC 11 is currently reviewing standardized angle sizes, it being intended to cover these in Part 1 of EN 10 056. Upon publication of that European Standard, DIN 1028 and DIN 1029 will be withdrawn.

International Patent Classification

B 21 B 001/08
E 04 B 001/24
F 16 S 003/00