UDC 621.882.219

April 1983

Eyebolts

DIN 444

Augenschrauben

Supersedes
October 1981 edition

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

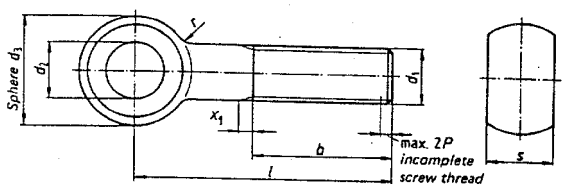
Dimensions in mm

1 Field of application

This standard specifies eyebolts with M 5 to M 39 metric threads of product grades A, B and C.

2 Dimensions, designation

Type A (product grade C = design g)
Type B (product grade B = design mg)
Type C (product grade A = design m)



x_1 in accordance with DIN 76 Part 1

Designation of a type A (product grade C) eyebolt with d_1 = M 10 screw thread, length l = 70 mm and of property class 4.6:

Eyebolt DIN 444 – A M 10 x 70 – 4.6

Continued on pages 2 to 5

Screw thread d_1				M 5	M 6	M 8	M 10	M 12	M 16
P			1)	0,8	1	1,25	1,5	1,75	2
b^{+2P}_{0}			2)	16	18	22	26	30	38
			3)	–	–	28	32	36	44
			4)	–	–	–	–	49	57
d_2			H9 5)	5	6	8	10	12	16
d_3 6)	max.			12	14	18	20	25	32
	min.	Type A		10,9	12,9	16,9	18,7	23,7	30,4
		Type B and C		11,57	13,57	17,57	19,48	24,48	31,38
r			≈	2,5	4	4	4	6	6
s		Type A	max.	8	9	11	14	17	19
			min.	7,52	8,52	10,3	13,3	16,3	18,16
		Type B and C	max.	6	7	9	12	14	17
			min.	5,88	6,85	8,85	11,82	13,82	16,82

Nominal size	l Type A min.	l Type A max.	l Type B min.	l Type B max.	l Type C min.	l Type C max.	Weight (7,85 kg/dm³) kg/1000 pieces ≈					
30	28,95	31,05	29,35	30,65	29,6	30,4	7,93					
35	33,75	36,25	34,2	35,8	34,5	35,5	8,70	12,6				
40	38,75	41,25	39,2	40,8	39,5	40,5	9,47	13,7	25,0			
45	43,75	46,25	44,2	45,8	44,5	45,5	10,3	14,8	26,9	36,0		
50	48,75	51,25	49,2	50,8	49,5	50,5	11,0	15,9	28,9	39,1		
55	53,5	56,5	54,05	55,95	54,4	55,6	11,8	17,0	30,9	42,2	67,0	
60	58,5	61,5	59,05	60,95	59,4	60,6	12,6	18,1	32,8	45,3	71,4	
65	63,5	66,5	64,05	65,95	64,4	65,6	13,3	19,2	34,8	48,4	75,8	
70	68,5	71,5	69,05	70,95	69,4	70,6	14,1	20,3	36,8	51,5	80,3	149
75	73,5	76,5	74,05	75,95	74,4	75,6	14,9	21,5	38,8	54,6	84,8	157
80	78,5	81,5	79,05	80,95	79,4	80,6	15,7	22,6	40,7	57,6	89,2	164
90	88,25	91,75	88,9	91,1	89,3	90,7		23,7	44,7	63,8	98,1	180
100	98,25	101,75	98,9	101,1	99,3	100,7			48,6	70,0	106	196
110	108,25	111,75	108,9	111,1	109,3	110,7			52,6	76,1	115	212
120	118,25	121,75	118,9	121,1	119,3	120,7			56,5	82,3	124	228
130	128	132	128,75	131,25	129,2	130,8			60,5	88,4	133	244
140	138	142	138,75	141,25	139,2	140,8			64,4	94,5	142	259
150	148	152	148,75	151,25	149,2	150,8				101	151	275
160	156	164	158,75	161,25	159,2	160,8					160	291
180	176	184	178,75	181,25	179,2	180,8					178	322
200	195,4	204,6	198,55	201,45	199,1	200,9					195	354
220	215,4	224,6	218,55	221,45	219,1	220,9					211	383
240	235,4	244,6	238,55	241,45	239,1	240,9					229	414
260	254,8	265,2	258,4	261,6	258,9	261					247	446

1) P = Pitch of thread
2) For $l \leq 125$ mm
3) For 125 mm $< l \leq 200$ mm
4) For $l > 200$ mm
5) Other tolerance zones on agreement
6) See page 3

Screw thread d_1		M 20	M 24	(M 27)	M 30	(M 33)	M 36	(M 39)
P	1)	2,5	3	3	3,5	3,5	4	4
b^{+2P}_{0}	2)	46	54	60	66	—	—	—
	3)	52	60	66	72	78	84	90
	4)	65	73	79	85	91	97	103
d_2	H9 5)	18	22	24 7) 25	27 7) 28	30	32 33 7)	35 36 7)
d_3 6) max.	Type A	40	45	50	55	60	65	70
d_3 6) min.	Type A	38,4	43,4	48,4	53,1	58,1	63,1	68,1
d_3 6) min.	Type B and C	39,38	44,38	49,38	54,26	59,26	64,26	69,26
r	≈	6	10	10	10	16	16	16
s	Type A max.	24	28	30	34	38	41	46
	Type A min.	23,16	27,16	29,16	33	37	40	45
	Type B and C max.	22	25	27	30	34	38	41
	Type B and C min.	21,79	24,79	26,79	29,79	33,75	37,75	40,75

Nominal size	l Type A min.	Type A max.	Type B min.	Type B max.	Type C min.	Type C max.	Weight (7,85 kg/dm³) kg/1000 pieces ≈						
80	78,5	81,5	79,05	80,95	79,4	80,6							
90	88,25	91,75	88,9	91,1	89,3	90,7							
100	98,25	101,75	98,9	101,1	99,3	100,7	334	454					
110	108,25	111,75	108,9	111,1	109,3	110,7	359	489					
120	118,25	121,75	118,9	121,1	119,3	120,7	383	524	618				
130	128	132	128,75	131,25	129,2	130,8	408	560	663				
140	138	142	138,75	141,25	139,2	140,8	433	596	708				
150	148	152	148,75	151,25	149,2	150,8	457	631	753	997	1240		
160	156	164	158,75	161,25	159,2	160,8	482	667	798	1050	1310	1570	1880
180	176	184	178,75	181,25	179,2	180,8	531	738	888	1160	1440	1730	2070
200	195,4	204,6	198,55	201,45	199,1	200,9	581	809	978	1270	1570	1890	2250
220	215,4	224,6	218,55	221,45	219,1	220,9	624	868	1060	1370	1690	2050	2420
240	235,4	244,6	238,55	241,45	239,1	240,9	674	939	1140	1480	1820	2200	2610
260	254,8	265,2	258,4	261,6	258,9	261	723	1010	1230	1590	1960	2350	2790
280	274,8	285,2	278,4	281,6	278,9	281			1320	1700	2100	2500	2970
300	294,8	305,2	298,4	301,6	298,9	301			1400	1810	2240	2650	3100

Lengths exceeding 300 mm shall be graded by steps of 20 mm.

The commercial lengths are indicated by their weights. The weights are guideline values.

Bracketed sizes and intermediate lengths should be avoided wherever possible.

1) to 5) see page 2

6) If eyebolts are drop forged, the permissible deviations for forgings F specified in DIN 7526 shall apply to the dimensions of the unmachined portion and to the residual flash and mismatch in the case of product grades B and C, whereas the permissible deviations specified in the above table or in DIN ISO 4759 Part 1 or in DIN 267 Part 2 (May 1980 draft) shall apply to the dimensions of the machined portion. By way of departure from DIN 267 Part 2 (May 1980 draft) the maximum peak-to-valley height of the shank may be R_{max} 100 µm in the case of product grades A and B. For the eyehole, R_{max} = 25 is permissible for all three types.

7) 24, 27, 33 and 36 mm bore diameters have been included additionally, taking account of the bolts specified in DIN 1443 and DIN 1444. If eyebolts are to be supplied with these bores, the bore diameter shall be indicated in the designation (see example of designation).

DIN 962 *) specifies the designation of additional forms, types and ordering details as far as the said standard is applicable to eyebolts.

The eyebolts may also be supplied with a screw thread almost close to the eye. In this case the letter L shall be included in the designation, for example:

Eyebolt DIN 444 – LA M 10 x 70 – 4.6

For this type of eyebolt the following dimensions shall apply to the distance from the last complete thread to the centre of the eyehole.

Screw thread d_1	M 5	M 6	M 8	M 10	M 12	M 16	M 20	M 24	M 27	M 30	M 33	M 36	M 39
Distance max.	11	14	16	18	23	27	32	40	42	46	54	59	61

If M 27, M 30, M 36 or M 39 eyebolts are to be supplied with 24, 27, 33 or 36 mm bore diameters, the bore diameter shall be indicated in the designation, for example:

Eyebolt DIN 444 – A M 30 x 200 x 27 – 4.6

3 Technical delivery conditions

Material		Steel
General requirements		in accordance with DIN 267 Part 1
Screw thread	Tolerance	product grade A = 6g; product grade B = 6g; product grade C = 8g
	Standard	DIN 13 Part 13
Mechanical properties	Property class	4.6 5.6 other strength categories or materials subject to agreement
	Standard	DIN ISO 898 Part 1
Permissible dimensional deviations	Product grade	A (m); B (mg); C (g)
	Standard	DIN ISO 4759 Part 1
Surface		DIN 267 Part 2 *) shall apply to the peak-to-valley heights of surfaces (see also footnote 6 on page 3) permissible surface defects in accordance with DIN 267 Part 19 galvanic surface protection in accordance with DIN 267 Part 9 hot-dip galvanizing in accordance with DIN 267 Part 10
Acceptance testing		in accordance with DIN 267 Part 5 *)

Standards referred to

DIN 13 Part 13	ISO metric screw threads; review of screw threads for bolts and nuts from 1 to 52 mm thread diameter and limiting sizes
DIN 76 Part 1	Runouts, undercuts for ISO metric threads in accordance with DIN 13
DIN 267 Part 1	Fasteners; technical delivery conditions, general requirements
DIN 267 Part 2 *)	Fasteners; technical delivery conditions, types and dimensional accuracy
DIN 267 Part 5 *)	Fasteners; technical delivery conditions, acceptance testing
DIN 267 Part 9	Fasteners; technical delivery conditions, components with electroplated coatings
DIN 267 Part 10	Fasteners; technical delivery conditions, hot-dip galvanized parts
DIN 267 Part 19	Fasteners; technical delivery conditions, surface defects of screws
DIN 962 *)	Screws and nuts; designations, types and designs
DIN 1443	Bolts without head; dimensions in accordance with ISO
DIN 1444	Bolts with head; dimensions in accordance with ISO
DIN 7526	Steel forgings; tolerances and permissible deviations for drop forgings
DIN ISO 898 Part 1	Mechanical properties of fasteners; bolts, screws and studs
DIN ISO 4759 Part 1	Tolerances for fasteners; bolts, screws and nuts with thread diameters from 1,6 up to and including 150 mm and product grades A, B and C

*) At present at the stage of draft

Previous editions

DIN 444 Part 1: 04.42, 11.53, 04.63; DIN 444: 12.33, 10.37, 01.71, 10.81

Amendments

Compared with the October 1981 edition, the following amendments have been made:

a) The correlation between types and product grades has been corrected in agreement with previous editions of this standard.

b) The limiting values for dimensions d_3, s and l have been changed correspondingly.

Explanatory notes

This edition of DIN 444 contains corrections which had become necessary due to an incorrect correlation between limiting sizes and types in the October 1981 edition of the standard.

For information, the following amendments and additions made in the October 1981 edition compared with the January 1971 edition are specified once more:

a) The permissible limiting values of the individual dimensions have been adopted. These values have regard to the tolerances of DIN 267 Part 2 or DIN ISO 4759 Part 1, in so far as DIN ISO 4759 Part 1 supersedes Standard DIN 267 Part 2.

b) Within the meaning of DIN ISO 4759 Part 1 the term "designs" has been replaced by "product grades". Both terms are practically identical, i.e. A ≙ m, B ≙ mg and C ≙ g. The code letters A, B and C for the product grades are not in line with the previous form letters given in DIN 444 as demonstrated by the following comparison:

Type C ≙ product grade A (m), previously design C

Type B ≙ product grade B (mg), previously design B

Type A ≙ product grade C (g), previously design A

c) With regard to existing documents the previous type letters for eyebolts have been retained in the designation and have been associated, on top of the figure, with the product grades conforming to DIN ISO 4759 Part 1 and the previous designs specified in DIN 267 Part 2.

d) The 24, 27, 33 and 36 mm bore diameters for sizes M 27, M 30, M 36 and M 39 have been additionally adopted, thus enabling the eyebolts to be used with the bolts conforming to the new Standards DIN 1443 and DIN 1444 (corresponding to ISO 2340 and ISO 2341). With regard to existing documents and to the previous designation of eyebolts the previous bore diameters have been retained additionally for these four sizes. The new bore diameters must be indicated in the designation.

e) The technical delivery conditions have been harmonized with the corresponding standards, part of which have been published for the first time.

International Patent Classification

B 21 D11-06