

UDC 621.882.211

September 1987

# M 5 to M36 hexagon head screws threaded up to the head

Product grade C

**DIN**  
**558**

Sechskantschrauben mit Gewinde bis Kopf; Gewinde M 5  
bis M 36; Produktklasse C

This standard, together with  
DIN ISO 4018, September 1987 edition,  
supersedes the December 1983 edition.

This standard should be used together with ISO 4018. For details, see Explanatory notes. It is intended to withdraw the present standard by 1 July 1992 at the latest.

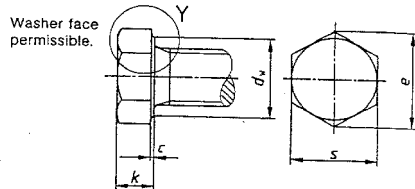
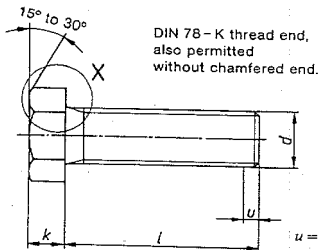
*In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.*

Dimensions in mm

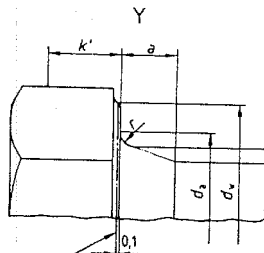
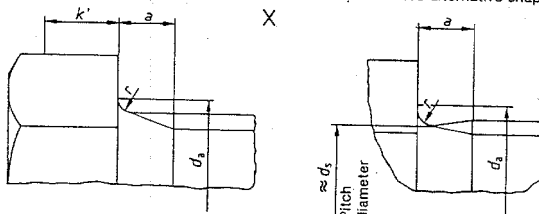
## 1 Field of application

This standard specifies requirements for M 5 to M 36 hexagon head screws threaded up to the head and assigned to product grade C. If, in special cases, screws are to comply with specifications other than those given in this standard, e.g. regarding nominal lengths, these shall be selected in accordance with the appropriate standards.

## 2 Dimensions



Permitted alternative shape



Continued on pages 2 to 4

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Thread size			M 5	M 6	M 8	M 10	M 12	M 16	M 20	M 24	M 30	M 36
$P^1)$			0,8	1	1,25	1,5	1,75	2	2,5	3	3,5	4
$a^2)$	max.		3,2	4	5	6	7	8	10	12	14	16
$c$	max.		0,5	0,5	0,6	0,6	0,6	0,8	0,8	0,8	0,8	0,8
$d_n$	max.		6	7,2	10,2	12,2	14,7	18,7	24,4	28,4	35,4	42,4
$d_w$	min.		6,7	8,7	11,4	15,4	17,2	22	27,7	33,2	42,7	51,1
$e$	min.		8,63	10,89	14,2	18,72	20,88	26,17	32,95	39,55	50,85	60,79
$k$	Nominal size		3,5	4	5,3	6,4	7,5	10	12,5	15	18,7	22,5
	min.		3,12	3,62	4,92	5,95	7,05	9,25	11,6	14,1	17,65	21,45
	max.		3,88	4,38	5,68	6,85	7,95	10,75	13,4	15,9	19,75	23,55
$k'$	min.		2,2	2,5	3,45	4,2	4,95	6,5	8,1	9,9	12,4	15
$r$	min.		0,2	0,25	0,4	0,4	0,6	0,6	0,8	0,8	1	1
$s$	max. = nominal size		8	10	13	17	19	24	30	36	46	55
	min.		7,64	9,64	12,57	16,57	18,48	23,16	29,16	35	45	53,8
$l$			Mass (7,85 kg/dm <sup>3</sup> ) for 1000 units in kg, approximately									
Nominal size	min.	max.										
10	9,2	10,8	2,63									
12	11,1	12,9	2,87	4,42								
16	15,1	16,9	3,37	5,11	11,1	19,2						
20	18,95	21,05	3,87	5,8	12,3	21,2	31,5					
25	23,95	26,05	4,49	6,65	13,9	23,7	34,1	70,2				
30	28,95	31,05	5,11	7,51	15,5	26,2	37,7	76,9	134			
35	33,75	36,25	5,73	8,37	17,1	28,7	41,3	83,5	145	229		
40	38,75	41,25	6,35	9,23	18,7	31,2	44,9	90,2	155	244	444	
45	43,75	46,25		10,1	20,3	33,7	48,5	97,1	165	259	468	
50	48,75	51,25		11	21,8	36,2	52	103	176	274	492	783
55	53,5	56,5			23,4	38,7	55,6	110	186	289	515	817
60	58,5	61,5			25	41,3	58,2	117	196	304	539	851
65	63,5	66,5			26,6	43,8	62,8	123	207	319	562	886
70	68,5	71,5				46,3	66,4	130	217	334	586	910
80	78,5	81,5				51,3	73,6	144	238	363	633	990
90	88,25	91,75					80,8	157	258	313	681	1060
100	98,25	101,75					88	170	279	423	728	1140
As a general rule, screws are manufactured in the sizes for which values of mass (guideline values) have been given.												
Lengths over 100 mm shall be graded in 10 mm steps.												
1) $P$ = pitch of thread (coarse pitch thread).												
2) $a$ min. not less than $1 P$ .												

### 3 Technical delivery conditions

Material		Steel
General requirements		As specified in DIN 267 Part 1.
Thread	Tolerance	8 g
	Standard	DIN 13 Parts 12 and 15.
Mechanical properties	Property class (material)	3.6, 4.6 <sup>1)</sup>
	Standard	ISO 898 Part 1.
Limit deviations, geometrical tolerances	Product grade	C (previously, design g)
	Standard	ISO 4759 Part 1.
Surface finish	As processed. DIN 267 Part 2 shall apply with regard to surface roughness. DIN 267 Part 9 shall apply with regard to electroplating. DIN 267 Part 10 shall apply with regard to hot dip galvanizing.	
Acceptance inspection	DIN 267 Part 5 shall apply with regard to acceptance inspection.	
1) If the property class is not given in the designation, property class 3.6 or 4.6 shall apply, at the discretion of the manufacturer.		

### 4 Designation

Designation of an M12 hexagon head screw of nominal length,  $l = 80$  mm:

Hexagon head screw DIN 558 – M12 × 80

DIN 962 shall apply to the designation of designs and types, with additional details to be given when ordering. The DIN 4000 – 2 – 1 tabular layout of article characteristics shall apply to screws covered in this standard.

#### Standards referred to

DIN 13 Part 12	ISO metric screw threads; coarse and fine pitch threads with diameters from 1 to 300 mm; selection for diameters and pitches
DIN 13 Part 15	ISO metric screw threads; fundamental deviations and tolerances for screw threads of 1 mm diameter and larger
DIN 78	Thread ends and ends of projection of bolt ends 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; finish and dimensional accuracy
DIN 267 Part 5	Fasteners; technical delivery conditions; acceptance inspection
DIN 267 Part 9	Fasteners; technical delivery conditions; electroplated components
DIN 267 Part 10	Fasteners; technical delivery conditions; hot-dip galvanized components
DIN 962	Bolts, screws, studs and nuts; designations; types and finishes
DIN 4000 Part 2	Tabular layout of article characteristics for bolts, screws and nuts
ISO 898 Part 1	Mechanical properties of fasteners; bolts, screws and studs
ISO 4759 Part 1	Tolerances for fasteners; bolts, screws, and nuts with thread diameters $\geq 1.6$ and $\leq 150$ mm and product grades A, B and C

#### Previous editions

DIN 558 Suppl.: 10.26; DIN 558 Part 1: 01.41, 08.53, 03.63; DIN 558: 02.23, 04.25, 07.34, 12.67, 12.83.

#### Amendments

The following amendments have been made to the December 1983 edition.

- A note on the period of validity of this standard has been included.
- For sizes M10 and M12, the widths across flats specified in ISO 272 have been deleted.
- Size M14 has been deleted.
- A reference line for the determination of the bearing face diameter,  $d_w$ , has been included.

### Explanatory notes

For more than 20 years efforts have been directed towards the achievement of the international interchangeability of fasteners by preparing international standards for the product concerned. ISO Standards have now been published for the most important types of fasteners (see ISO Standards Handbook 18).

However, international efforts only serve a useful purpose if national standards are adapted as far as possible to international standards, or, ideally, replaced by them. Current DIN Standards already agree in substance with the relevant ISO Standards, but still differ in some respects, as for instance in the widths across flats for hexagon products.

The Federal Republic of Germany adopted International Standard ISO 272 on widths across flats as national standard DIN ISO 272 in October 1979. Nevertheless, widths across flats deviating from DIN ISO 272 are still being used in Germany for nominal sizes M 10, M 12, M 14 and M 22. The table below compares the previous widths across flats with the new ones specified for the four nominal sizes referred to.

Thread size	M 10	M 12	M 14	M 22
Previous width across flats, in mm	17	19	22	32
New width across flats as in ISO 272, in mm	16	18	21	34

The manufacturers and users of hexagon products participating in the work of the *Normenausschuß Mechanische Verbindungselemente* (Fasteners Standards Committee), together with representatives of the dealers in fasteners, have decided to introduce the new widths across flats in all relevant product standards. Since experience has shown, that the introduction of the new widths across flats has not been advanced by their inclusion in DIN Standards merely as preferred alternatives to the previous widths across flats, the following decisions have been reached to accelerate the changeover procedure:

Supplementary to current DIN Standards specifying the previous widths across flats, DIN ISO Standards dealing with the same products will, wherever ISO Standards are

available, be published which, besides introducing a number of other minor amendments, will specify the new widths across flats conforming to ISO 272. In both DIN and DIN ISO Standards attention will be drawn to the fact that the relevant ISO Standards are to be preferred and that the DIN Standard is to be replaced after a transition period of 5 years.

If no relevant ISO Standard is available, the DIN Standard will contain a foreword stating that the previous width across flats specifications are to be withdrawn after a transition period of 5 years and replaced by those specified in ISO 272.

This sets a time limit for both manufacturer and user of hexagon products by which the changeover to the new widths across flats must be effected. The responsible committee is of the opinion, that it will still be possible after this period to obtain fasteners complying with the superseded specifications as spare parts.

In some cases, the replacement of the previous DIN Standards by the relevant ISO Standards will have further consequences, besides the changeover to the new widths across flats, attention being drawn to this circumstance in the national foreword of the relevant DIN ISO Standards. These consequences result from the fact that the ISO Standards have not yet reached the same level of completeness as the DIN Standards. Thus a number of nominal sizes, as well as several product specifications for fine pitch threads are not found in the ISO product standards. Furthermore, ISO Standards on technical delivery conditions are still in the initial stages, so that specific requirements are still subject to separate agreement when ordering products in accordance with ISO Standards, as they are not included in the designation for order purposes.

Besides these consequences, which are of importance when applying the new ISO Standards, the amendment of the widths across flats also have a number of consequences as regards the use of the new products which the designer must take into consideration. Besides the amended assembly sizes, this applies above all to the different surface pressure for the bearing area of the nut or the heads of the bolts. These difficulties are discussed in Recommendation VDA 262\*) published by the *Verband der Automobilindustrie e.V.* (German Automobile Manufacturers Association).

### International Patent Classification

F 16 B 35/00

\*) Obtainable from: *Dokumentation Kraftfahrwesen e.V.*, Grönerstraße 5, D-7140 Ludwigsburg.