Hexagon nuts
with flange

DIN 6923

Sechskantmuttern mit Flansch

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.

This standard incorporates all the essential specifications of International Standard ISO 4161 (see Explanatory notes), with national addenda.

Dimensions in mm

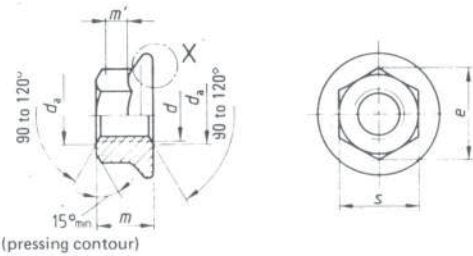
1 Field of application

This standard gives specifications for hexagon nuts with flange, with metric coarse or fine thread with diameters from 5 to 20 mm, assigned to product grade A. If, in special cases, nuts are to comply with specifications other than those given in this standard, e.g. regarding property classes, these shall be selected in accordance with the appropriate standards.

2 Reference to other standards

See the list of standards referred to on page 3.

3 Dimensions



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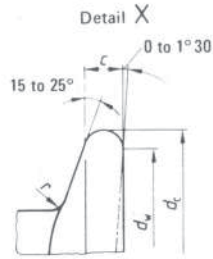


m' = minimum wrenching height. For this zone at least e shall be maintained.
For designation see clause 5.

Continued on pages 2 to 4

Table 1.

Thread size d		M 5	M 6	M 8	M 10	M 12	M 14	M 16	M 20
		–	–	M8×1	M10×1,25	M12×1,5	M14×1,5	M16×1,5	M20×1,5
		–	–	–	(M10×1)	(M12×1,25)	–	–	–
P [1]		0,8	1	1,25	1,5	1,75	2	2	2,5
c	min.	1	1,1	1,2	1,5	1,8	2,1	2,4	3
d_a	min.	5	6	8	10	12	14	16	20
	max.	5,75	6,75	8,75	10,8	13	15,1	17,3	21,6
d_c	max.	11,8	14,2	17,9	21,8	26	29,9	34,5	42,8
d_w	min.	9,8	12,2	15,8	19,6	23,8	27,6	31,9	39,9
e	min.	8,79	11,05	14,38	16,64	20,03	23,36	26,75	32,95
m	max.	5	6	8	10	12	14	16	20
	min.	4,7	5,7	7,6	9,6	11,6	13,3	15,3	18,9
m'	min.	2,2	3,1	4,5	5,5	6,7	7,8	9	11,1
s Nominal dimension =	max.	8	10	13	15	18	21	24	30
	min.	7,78	9,78	12,73	14,73	17,73	20,67	23,67	29,67
r [2]	max.	0,3	0,36	0,48	0,6	0,72	0,88	0,96	1,2

e min. = 1,13 s min.

The sizes in brackets should be avoided for functional reasons, if possible.

1) P = pitch of coarse thread as specified in DIN 13 Part 12.

2) Radius r shall apply both for the edges of adjoining flats and for the transition between hexagon corners and flange.

4 Technical delivery conditions

Material		Steel	Stainless steel
General requirements		In accordance with DIN 267 Part 1.	
Thread	Tolerance	6H	
	Standard	DIN 13 Part 12 and Part 15	
Mechanical properties	Property class [1] (material)	8, 10, 12	A2-70
	Standard	DIN ISO 898 Part 2 DIN 267 Part 23 (at present at the stage of draft)	DIN 267 Part 11
Permissible dimensional deviations and deviations of form	Product grade	A	
	Standard	DIN ISO 4759 Part 1 [2]	
Surface		As processed.	Bright.
		DIN 267 Part 2 (at present at the stage of draft) shall apply with regard to the peak-to-valley heights of the surfaces. DIN 267 Part 20 shall apply with regard to permissible surface irregularities. DIN 267 Part 9 shall apply with regard to electroplating. DIN 267 Part 10 shall apply with regard to hot-dip galvanizing.	
Acceptance testing		DIN 267 Part 5 (at present at the stage of draft) shall apply with regard to acceptance testing.	

1) Other property classes or materials shall be subject to agreement. 2) As a deviation from DIN ISO 4759 Part 1, May 1980 edition, subclause 11.3, the parallelism of the flats may lie within the tolerance class h13 for the width across flats.

5 Designation

Designation of an M 12 hexagon nut with flange, assigned to property class 8:

Hexagon nut DIN 6923 – M 12 – 8

The DIN 4000 – 2 – 7 tabular layout of article characteristics shall apply for nuts complying with this standard.

Standards referred to

DIN 13 Part 12	ISO metric screw threads; coarse and fine threads from 1 to 300 mm diameter, selection of diameters and pitches
DIN 13 Part 15	ISO metric screw threads; fundamental deviations and tolerances for screw threads from 1 mm diameter
DIN 267 Part 1	Fasteners; technical delivery conditions; general requirements
DIN 267 Part 2	(at present at the stage of draft) Fasteners; technical delivery conditions; types of finish and dimensional accuracy
DIN 267 Part 5	(at present at the stage of draft) Fasteners; technical delivery conditions; acceptance testing
DIN 267 Part 9	Fasteners; technical delivery conditions; electroplated components
DIN 267 Part 10	Fasteners; technical delivery conditions; hot-dip galvanized parts
DIN 267 Part 11	Fasteners; technical delivery conditions with addenda to ISO 3506, stainless and acid resistant steel components
DIN 267 Part 20	Fasteners; technical delivery conditions; surface irregularities on nuts
DIN 267 Part 23	Fasteners; technical delivery conditions; property classes for nuts with fine thread (ISO classes)
DIN ISO 898 Part 2	Mechanical properties of fasteners; nuts with specified proof load values
DIN ISO 4759 Part 1	Tolerances for fasteners; bolts, screws and nuts with thread diameters $\geq 1{,}6$ and ≤ 150 mm and product grades A, B and C

Other relevant standards

DIN 6921	Hexagon bolts with flange
DIN 6922	Hexagon bolts with flange and reduced shank

Explanatory notes

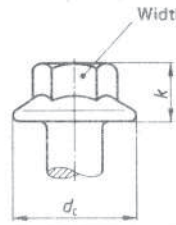
Draft Standards DIN 6921, DIN 6922 and DIN ISO 4161 dealing with hexagon flange bolts and nuts were published in August and September 1981, draft DIN ISO 4161 being the German version of draft International Standard ISO/DIS 4161 dealing with hexagon flange nuts. This draft International Standard which was approved by a large majority of ISO member bodies has been published recently.

Originally it was intended to adopt the international standard in full as a national standard and draft Standard DIN ISO 4161 was prepared. Then the competent technical committee of the *Normenausschuss Mechanische Verbindungselemente* (Fasteners Standards Committee) decided, however, to issue a DIN Standard as the international standard was not considered to be sufficiently comprehensive. There are no international reference standards for technical delivery conditions, for example, which are therefore to be dealt with in national standards (see e.g. acceptance testing as specified in DIN 267 Part 5 (at present at the stage of draft)). Given this fact, ISO 4161 has been incorporated in DIN 6923 without alterations in its material content, though with national addenda.

During the international work considerable difficulties arose with respect to the standardization of hexagon flange bolts, especially with regard to the installation conditions and the resulting head dimensions. The German position was defined in draft Standards DIN 6921 and DIN 6922 (September 1981 editions). Though these drafts took the results of international standardization so far achieved into account, they specified head sizes which, to a certain extent, ran counter to the views held by other countries.

The content of draft Standards DIN 6921 and DIN 6922 was given due consideration in the continuing international work and especially approved of by various European manufacturers and consumers. The discussions eventually concluded in a compromise, resulting in four types with varying head sizes in two product grades and each with two different types of shank. The compromise resulted in eight draft International Standards which are at present in preparation. Only two of them the contents of which have been incorporated in DIN 6921 and DIN 6922 are needed for national purposes. The following table summarizes the position.

Head sizes of hexagon bolts with flange



Thread size		M 5	M 6	M 8	M 10	M 12	M 14	M 16	M 20	Product grade	Standard national	Standard international
Width across flats s	Small series	7	8	10	13	15	18	21	–	A	–	ISO/DIS 8104 ISO/DIS 8105
		7	8	10	13	15	18	21	–	B	–	ISO/DIS 4160 ISO/DIS 4162
	Heavy series	8	10	13	15	16	18	21	27	A	DIN 6921 DIN 6922	ISO/DIS 8100 ISO/DIS 8101
		8	10	13	15	18	21	24	30	B	–	ISO/DIS 8102 ISO/DIS 8103
Flange diameter d_c	Small series	11,4	13,6	17	20,8	24,7	28,6	32,8	–	A	–	ISO/DIS 8104 ISO/DIS 8105
		11,4	13,6	17	20,8	24,7	28,6	32,8	–	B	–	ISO/DIS 4160 ISO 4161
	Heavy series	11,8	14,2	18	22,3	26,6	30,5	35	43	A	DIN 6921 DIN 6922	ISO/DIS 8100 ISO/DIS 8101
		11,8	14,2	18	22,3	26,6	30,5	35	43	B	–	ISO/DIS 8102 ISO/DIS 8103
Head height k	Small series	5,6	6,8	8,5	9,7	11,9	12,9	15,1	–	A	–	ISO/DIS 8104 ISO/DIS 8105
		5,6	6,8	8,5	9,7	11,9	12,9	15,1	–	B	–	ISO/DIS 4160 ISO/DIS 4162
	Heavy series	5,4	6,6	8,1	9,2	11,5	12,8	14,4	17,1	A	DIN 6921 DIN 6922	ISO/DIS 8100 ISO/DIS 8101
		5,4	6,6	8,1	8,6	10,4	12,4	14,1	17,7	B	–	ISO/DIS 8102 ISO/DIS 8103

Dimensions of hexagon flange nuts (for comparison)

Width across flats s	8	10	13	15	18	21	24	30	A	DIN 6923	ISO 4161
Flange diameter d_c	11,8	14,2	17,9	21,8	26	29,9	34,5	42,8			
Nut height m	5	6	8	10	12	14	16	20			

As can be seen from the table, for product grade A only the "heavy series" has been incorporated in DIN 6921 and DIN 6922. Identical widths across flats are specified for bolts and nuts of product grade B, heavy series. This corresponds to USA requirements for which no demand could be established in Germany, neither for manufacturing reasons nor as a result of tightening requirements.

For product grades A and B, the small series provides for equal widths across flats. Differences in the tightening conditions are allowed for in the dimensional tolerances. Adoption of the small series was not approved of at the national level because experience has shown that, even for product grade A, the head dimensions of this series do not satisfy all possible installation requirements, especially in cases where locking elements, such as bonding agents are used, requiring a higher loosening torque.

The relevant international standards work has not yet been finalized and so the above table is for information purposes only. The draft International Standards (ISO/DIS) given in the table have not yet been published.

International Patent Classification

F 16 B 37/00