IS 8536 (1987): Fasteners - Bolts, screws, studs and nuts - Symbols and designation of dimensions [PGD 31: Bolts, Nuts and Fasteners Accessories]

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Indian Standard

(Reaffirmed 2003)

FASTENERS — BOLTS, SCREWS, STUDS AND NUTS — SYMBOLS AND DESIGNATION OF DIMENSIONS

(First Revision)

Bolts, Nuts and Fasteners Accessories Sectional Committee, EDC 27 [Ref : Doc : EDC 27 (5035)]

National Foreword

This Indian Standard (First Revision), which is identical with ISO 225-1983 'Fasteners — Bolts, screws, studs and nuts — Symbols and designation of dimensions', issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on recommendation of the Bolts, Nuts and Fasteners Accessories Sectional Committee and approval of the Mechanical Engineering Division Council.

The original version of this standard IS : 8536-1977 'Dimensioning of fasteners' was based on ISO/DIS 1891·2 'Fasteners — Bolts, screws, nuts and accessories — Terminology and nomenclature' issued by ISO. It did not cover symbols, which have been now included in this revision. Further reference to published Indian Standards on fasteners has been deleted. By adoption of ISO 225-1983, this Indian Standard has been aligned with the International Standard.

In the adopted standard, certain terminology and conventions are not identical with those used in Indian Standards, attention is particularly drawn to the following:

Wherever the words 'International Standards' appear, referring to this standard, they should be read as 'Indian Standard'.

Cross Reference

International Standard	*Corresponding Indian Standard*
ISO 3508 Thread run-outs for fasteners with thread in accordance with ISO 261 and 262	IS : 1369-1982 Dimensions for screw thread runouts and under cuts (*second revision*) (Technically equivalent)
ISO 4753 Fasteners — Ends of parts with external metric ISO thread	IS : 1368-1980 Dimensions for ends of bolts and screws (*second revision*) (Technically equivalent)
ISO 4755 Fasteners — Thread undercuts for external metric ISO threads	IS : 1369-1982 (Technically equivalent)

Additional Information

This Indian Standard is the national implementation of ISO 225-1983; as such only the English text has been reproduced. If the French, Russian, German, Italian or Spanish text is required reference should be made to the original ISO publication

Adopted 22 June 1987

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BUREAU OF INDIAN STANDARDS
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1 Scope and field of application

This International Standard lays down the method of dimensioning bolts, screws, studs and nuts, recommended for use unless otherwise specified in the appropriate product standards.

It includes common symbols and describes the feature.

NOTES

1) The figures of the fasteners in this International Standard are only examples.

2) In addition to terms used in the three official ISO languages (English, French and Russian), this International Standard gives the equivalent terms in German, Italian and Spanish; these have been included at the request of ISO Technical Committee ISO/TC 2 and are published under the responsibility of the member bodies for Germany, F.R. (DIN), Italy (UNI) and Spain (IRANOR). However, only the terms given in the official languages can be considered as ISO terms.

Successive order of languages :

E : English
F : French
R : Russian
D : German
I : Italian
S : Spanish

2 References

ISO 3508, *Thread run-outs for fasteners with thread in accordance with ISO 261 and ISO 262.*

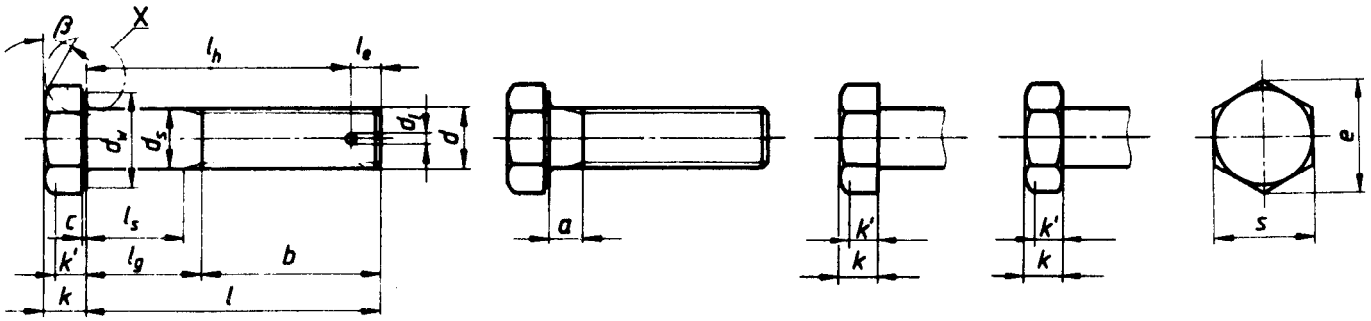
ISO 4753, *Fasteners — Ends of parts with external metric ISO thread.*

ISO 4755, *Fasteners — Thread undercuts for external metric ISO threads.*

3 Bolts, screws and studs

For thread run-out, see ISO 3508.

3.1 Hexagon head products



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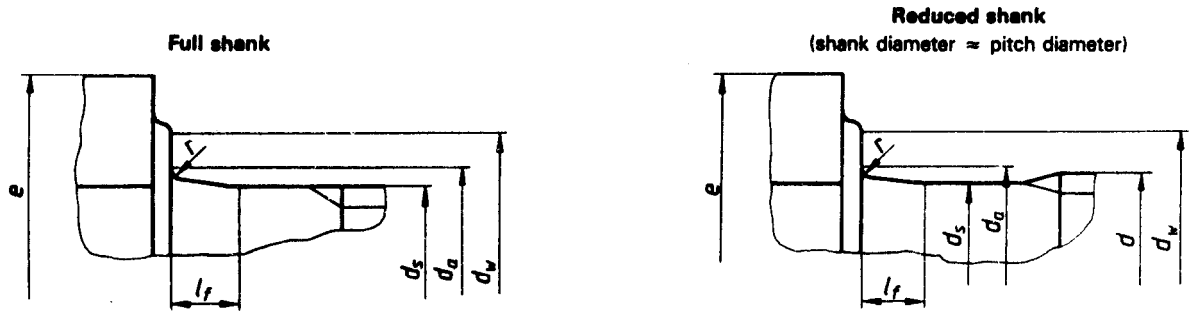


Figure 1

3.2 Hexagon head screw with flange

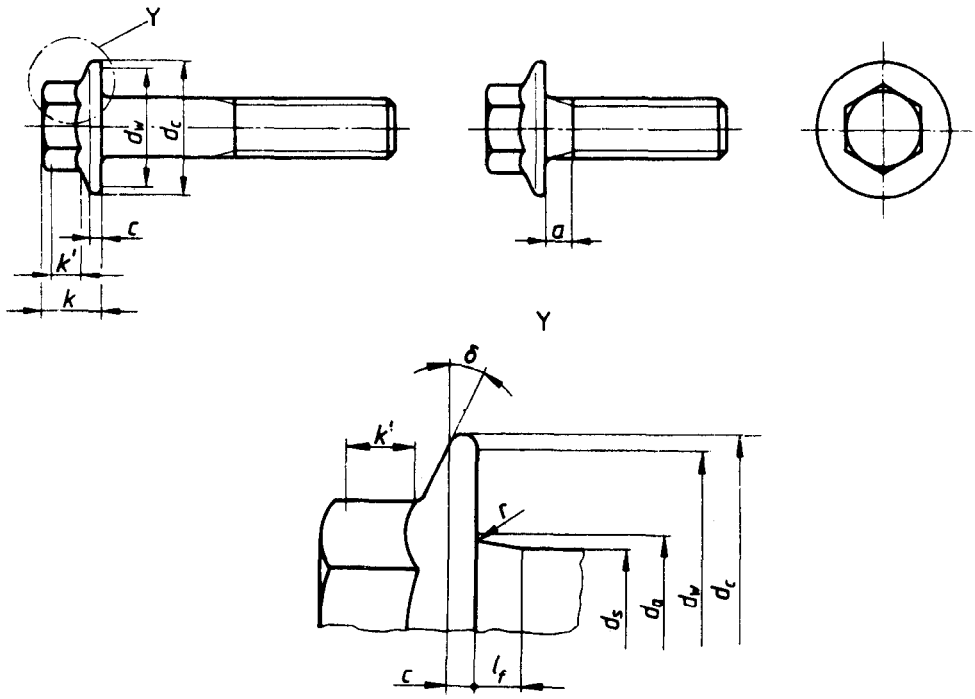


Figure 2

3.3 Hexagon socket head cap screws

3.3.1 Cylindrical heads

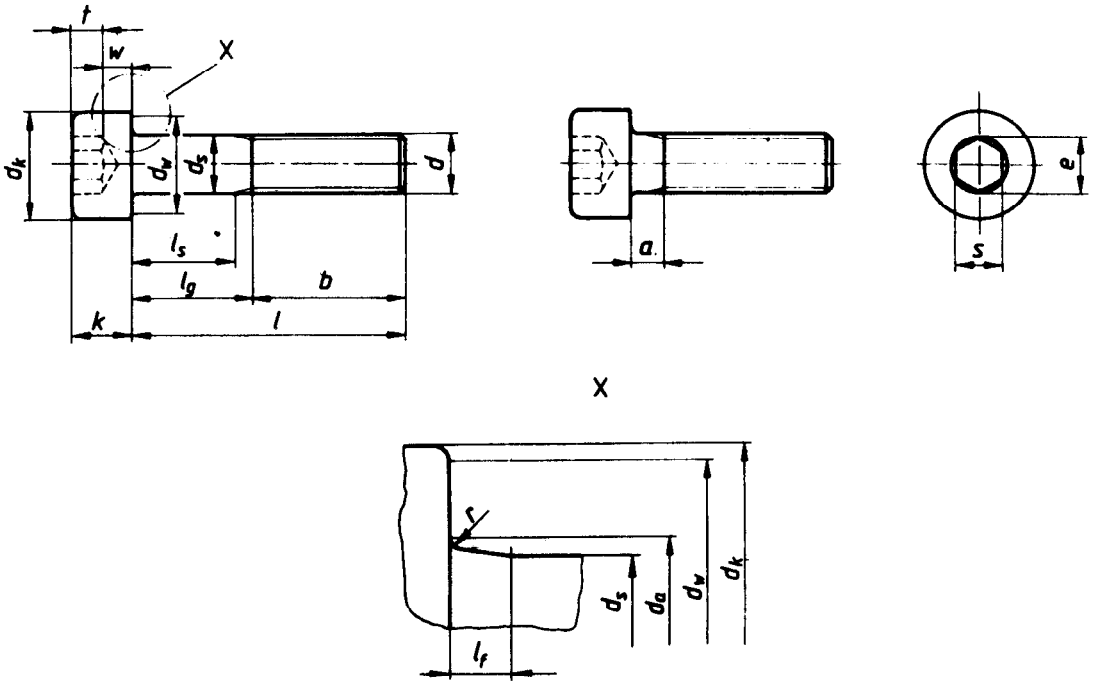


Figure 3

3.3.2 Countersunk heads

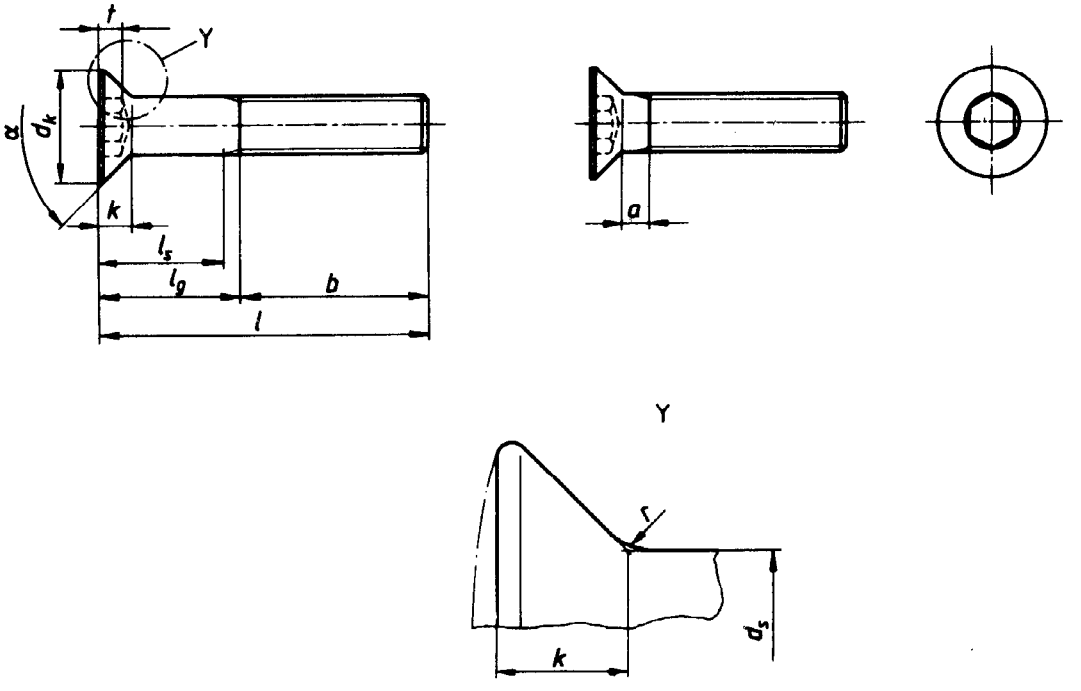


Figure 4

3.4 Slotted and cross recessed head screws

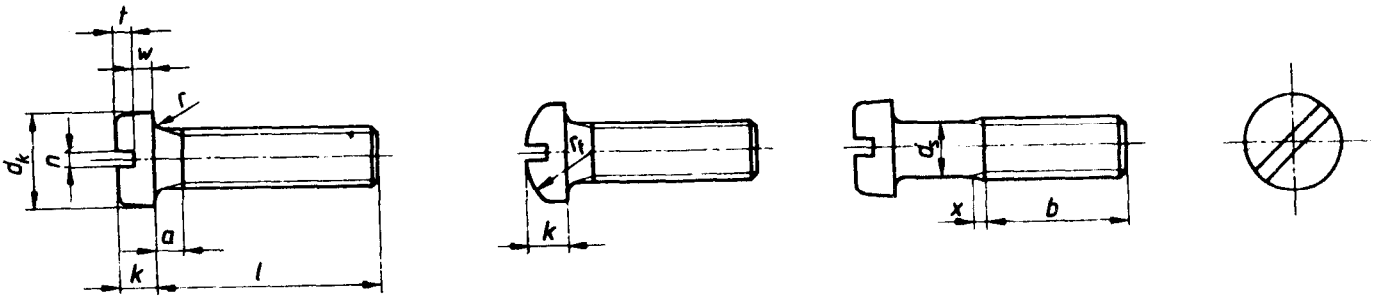


Figure 5

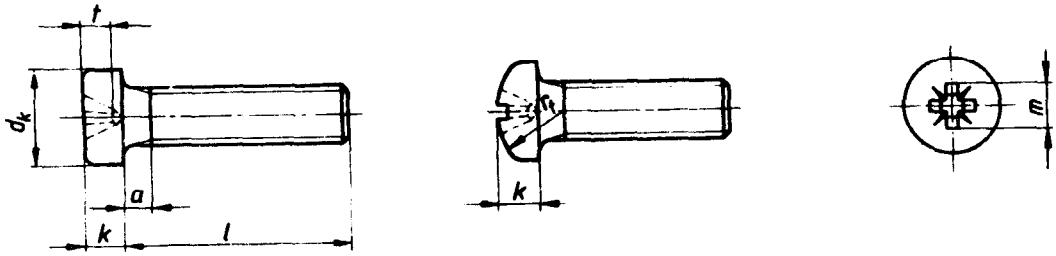


Figure 6

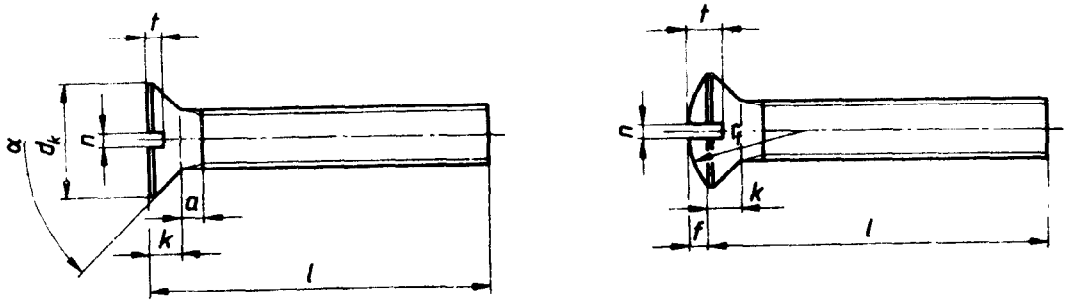


Figure 7

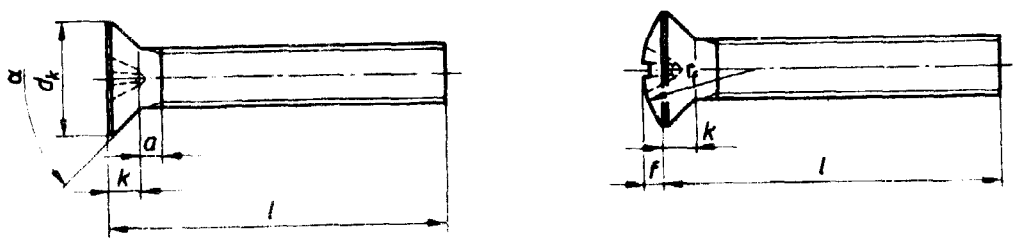


Figure 8

3.5 Studs

For thread undercuts, see ISO 4755.

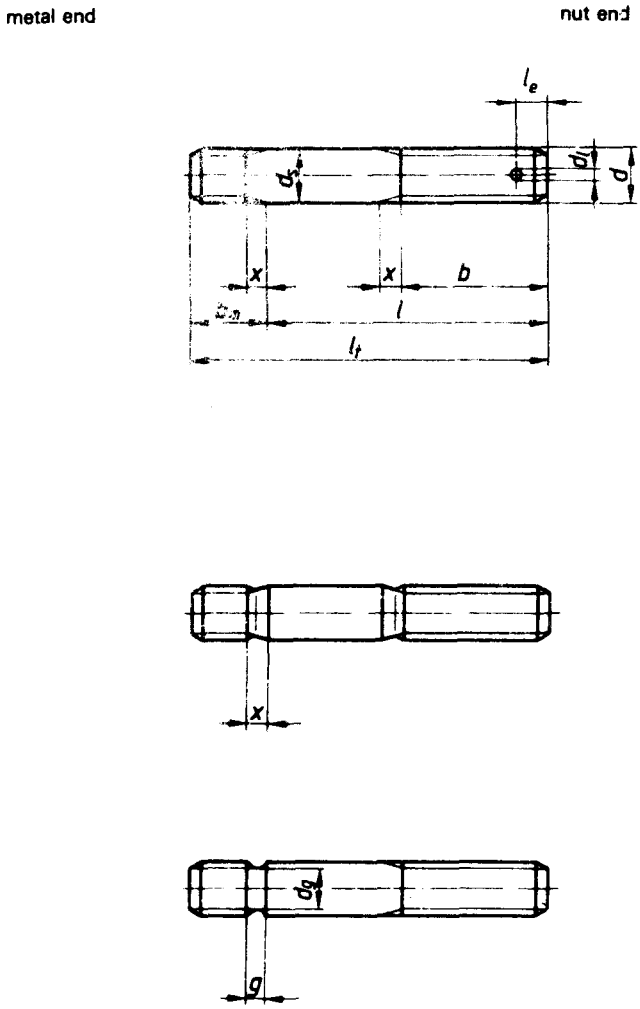


Figure 9

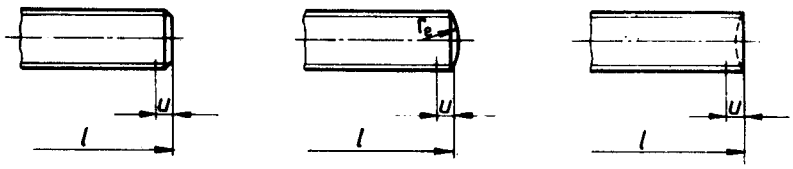
3.6 Set screws

Figure 10

3.7 **Thread ends** (points)

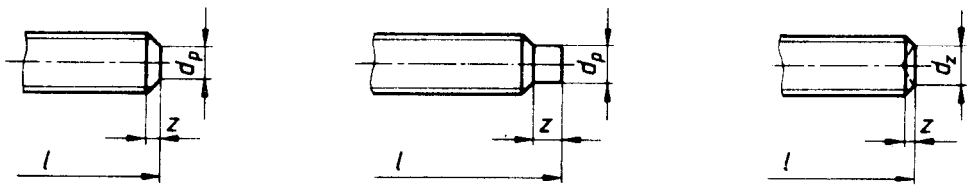
For bolt and screw ends,
see ISO 4753.

Normal thread ends



Chamfered end **Rounded end** **As-rolled end**

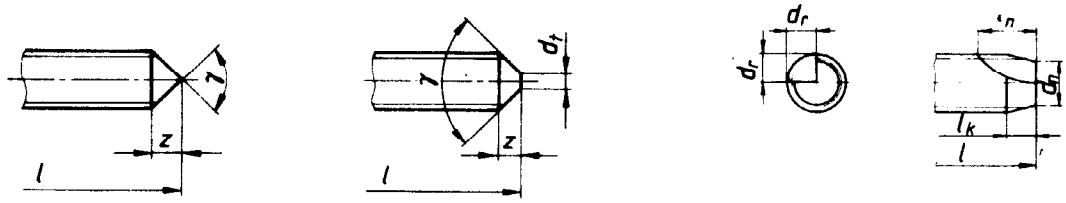
Figure 11



Flat point
(chamfered point)

Dog point
(short or long dog point)

Cup point



Cone point

Truncated cone point

Scrape point

Figure 12

Symbol	Designation
a	distance from the last full form thread to the bearing face (screws)
b	thread length
b_m	thread length of the stud (metal) end
c	height of the washer-faced portion or thickness of the flange (or collar)
d	basic major diameter (nominal diameter) of thread
d_e	transition diameter
d_c	flange (collar) diameter
d_f	diameter of the face
d_g	diameter of the undercut (groove)
d_k	diameter of the head
d_l	diameter of the split pin hole
d_n	diameter of the scrape point
d_p	diameter of the flat or dog point
d_r	width of the scrape
d_s	diameter of the unthreaded shank
d_t	diameter of the truncated cone point
d_w	diameter of the washer face (bearing face)
d_z	diameter of the cup point
e	width across corners
f	height of the raised (oval) portion of a raised countersunk head
g	width of the undercut

Symbol	Designation
k	height of the head
k'	wrenching height
l	nominal length
l_e	distance from the split pin hole to the thread end
l_f	transition length
l_g	distance from the last full form thread to the bearing face (shank length of bolt)
l_h	distance from centre line of split pin hole to bearing surface
l_k	length of the cone part of the scrape point
l_n	length of the scrape point
l_s	length of unthreaded shank
l_t	overall length
m	wing diameter of cross recesses
n	width of the slot
r	radius of curvature under head
r_e	radius of rounded thread end
r_f	radius of the raised portion of a head
s	width across flats
t	depth of the driving feature
u	incomplete thread end
w	thickness between driving feature and bearing face
x	length of the thread run-out

Symbol	Designation
z	length of point
α	countersink angle
β	angle of the chamfer
γ	angle of the cone
δ	angle of the flange

4 Nuts

4.1 Hexagon nuts

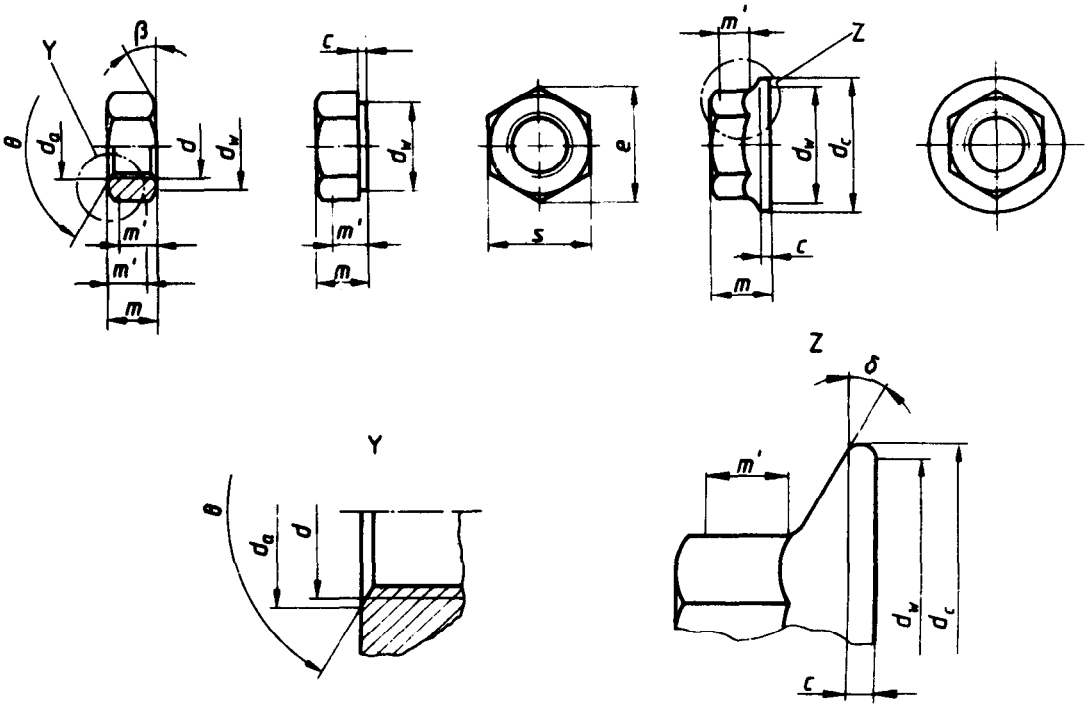


Figure 13

4.2 Slotted and castle nuts

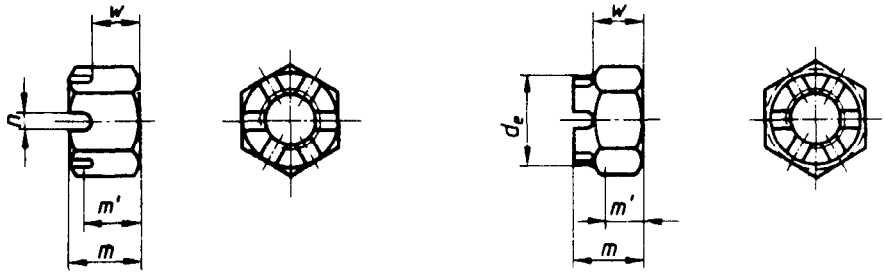


Figure 14

Symbol	Designation
c	height of the washer-faced portion or thickness of the flange (or collar)
d	basic major diameter (nominal diameter) of thread
d_e	diameter of the countersink
d_c	flange (collar) diameter
d_e	diameter of the castle
d_w	diameter of the bearing face
e	width across corners
m	height of the nut
m'	wrenching height
n	width of the slot
s	width across flats
w	bottom thickness
β	angle of the chamfer
δ	angle of the flange
θ	countersink angle