International Standard 6411

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Technical drawings — Simplified representation of centre holes

Dessins techniques — Représentation simplifiée des trous de centre

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6411 was developed by Technical Committee ISO/TC 10, *Technical drawings*, and was circulated to the member bodies in January 1980.

It has been approved by the member bodies of the following countries :

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The member body of the following country expressed disapproval of the document on technical grounds :

Netherlands

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Technical drawings — Simplified representation of centre holes

1 Scope and field of application

This International Standard specifies the simplified representation of centre holes and their designation. Simplified representation of centre holes may be used particularly when it is not necessary to show the exact form and size and where the designation of standardized centre holes is sufficient for information.

2 References

ISO 128, *Technical drawings — General principles of presentation.*

ISO 866, *Centre drills for centre holes without protecting chamfers — Type A.*

ISO 2540, *Centre drills for centre holes with protecting chamfers — Type B.*

ISO 2541, *Centre drills for centre holes with radius form — Type R.*

ISO 3098/1, *Technical drawings — Lettering — Part 1 : Currently used characters.*

ISO 6428, *Technical drawings — Requirements for microcopying.* [1)]

3 Indication on drawings

3.1 Requirements

Generally, three different requirements may be defined on technical drawings for the form and size of centre holes, namely :

a) centre hole is required on the finished part;

b) centre hole can be accepted on the finished part, but is not a fundamental requirement;

c) centre hole shall not exist on the finished part.

1) At present at the stage of draft.

3.2 Simplified representation

The symbols representing centre holes and their application to the end face of a shaft are shown in column 2 of table 1.

3.3 Designation of centre holes

The designation of centre holes is dependent on the drill and may be indicated with reference either to an International Standard or to any other standard dealing with this subject.

The designation of the centre hole itself consists of

— a reference to this International Standard;

— the letter for the type (R, A or B);

— the pilot diameter d;

— the outside countersink centre hole diameter D.

The two values are separated by a solidus.

Example : a centre hole[1], type B with d = 2,5 mm and D_3 = 8 mm may be indicated on the drawing as :

ISO 6411-B 2,5/8

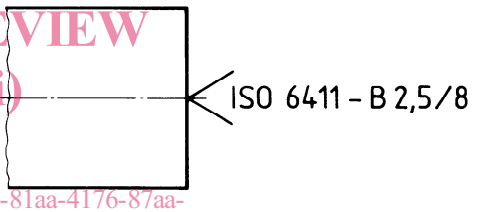
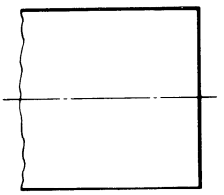
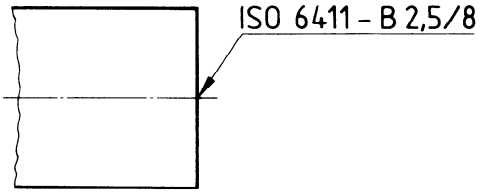
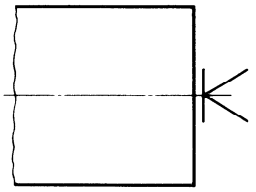
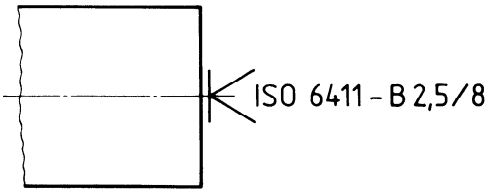
4 Interpretation of indication

The relationship between the various designations used to specify the centre holes, the dimensions represented by the given designations, and dimensions depending on the centre drill used are shown in table 2.

Further details specifying the dimensions of the centre hole, to be indicated preferably on the drawings, are given in annex A.

Table 1 — Representation and designation of centre holes on drawings

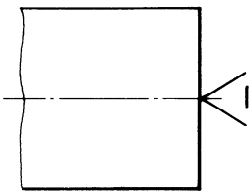
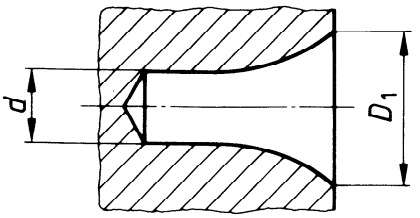
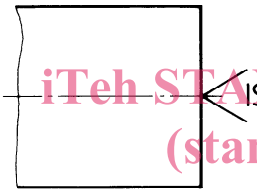
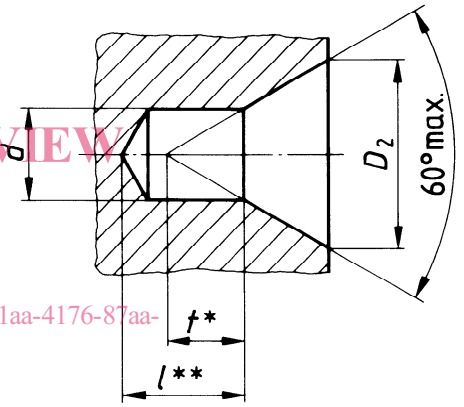
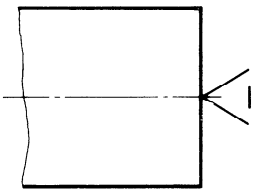
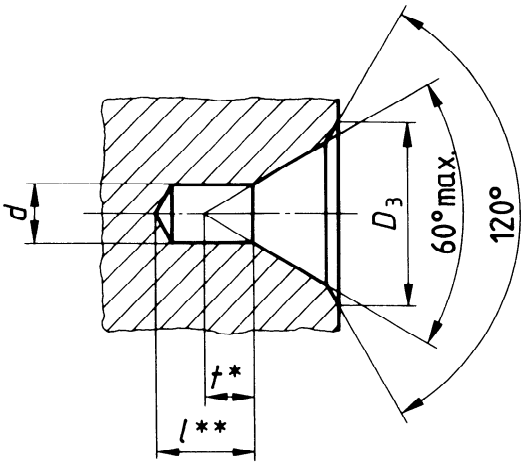
Dimensions in millimetres

Requirement	Representation	Designation
Centre hole is required on the finished part		
Centre hole may remain on the finished part		
Centre hole shall not exist on the finished part		

1) For the machining of such a centre hole, a drill with d = 2,5 and d_1 = 10 according to ISO 2540 is used.

Table 2 — Interpretation of the designation

Dimensions in millimetres

Type of centre hole	Designation (examples)	Interpretation of the designation
R with radius form (centre drill according to ISO 2541)		 d = 3,15 D_1 = 6,7
A without protecting chamfer (centre drill according to ISO 866)		 d = 4 D_2 = 8,5
B with protecting chamfer (centre drill according to ISO 2540)		 d = 2,5 D_3 = 8

* For dimension t, see annex A.

** Dimension l depends on the length of the centre drill. It should not be less than t.

Annex A

Dimensions for centre holes type R, A and B

The dimensions which are necessary to specify a centre hole are shown in table 3.

Table 3 — Dimensions of preferred centre holes

Dimensions in millimetres

d nom.	Type				
	R according to ISO 2541	A according to ISO 866		B according to ISO 2540	
	D_1 nom.	D_2 nom.	t ref.	D_3 nom.	t ref.
(0,5)		1,06	0,5		
(0,63)		1,32	0,6		
(0,8)		1,70	0,7		
1,0	2,12	2,12	0,9	3,15	0,9
(1,25)	2,65	2,65	1,1	4	1,1
1,6	3,35	3,35	1,4	5	1,4
2,0	4,25	4,25	1,8	6,3	1,8
2,5	5,3	5,30	2,2	8	2,2
3,15	6,7	6,70	2,8	10	2,8
4,0	8,5	8,50	3,5	12,5	3,5
(5,0)	10,6	10,60	4,4	16	4,4
6,3	13,2	13,20	5,5	18	5,5
(8,0)	17,0	17,00	7,0	22,4	7,0
10,0	21,2	21,20	8,7	28	8,7

NOTE — Sizes in brackets should be avoided whenever possible.

Annex B

Proportions and dimensions of symbols

In order to harmonize the sizes of the symbols specified in this International Standard with those of the other inscriptions on the drawing (dimensions, tolerances, etc.) the following rules shall be observed.

B.1 General requirements

B.1.1 The symbols shown in the table shall be inscribed with a line thickness (d') equal to 1/10 of the height (h) of the lettering used for the dimensions in the relevant drawing.

B.1.2 The numerals and capital letters used for the additional specifications of centre holes shall be inscribed with the same line thickness (d), height (h) and type of lettering as used for the dimensions in the relevant drawing, and in accordance with ISO 3098/1.

B.1.3 The minimum spacing between adjacent lines shall be in accordance with ISO 128 or ISO 6428.

It is recommended that this spacing be not less than 0,7 mm.

B.2 Proportions

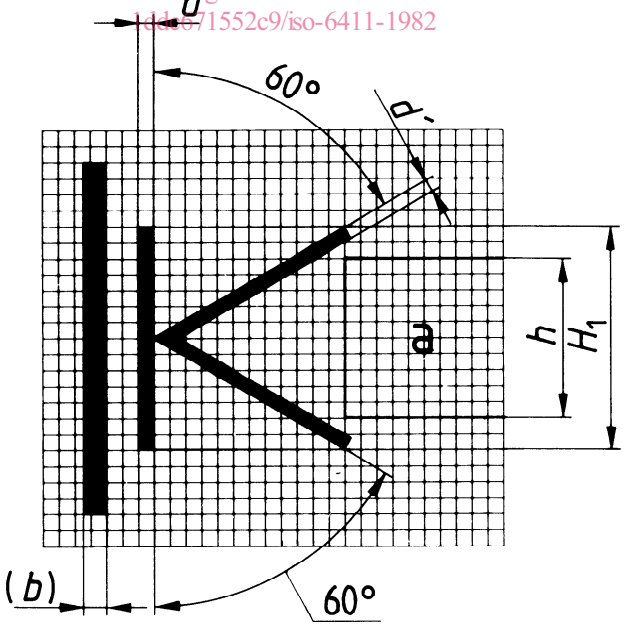
The symbol and its complements shown in area **a** (see B.3) shall be drawn in accordance with the figure.

B.3 Dimensions

The range of sizes to be used for the symbols and additional indications is given in table 4.

Table 4 — Dimensions, in millimetres

Line thickness for outlines of an item (b)	0,5	0,7	1	1,4	2	2,8
Height of numerals and capital letters (h)	3,5	5	7	10	14	20
Line thickness for symbols (d')	0,35	0,5	0,7	1	1,4	2
Line thickness for lettering (d)	see B.1.2					
Height H_1	5	7	10	14	20	28



Figure

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