

Technical drawings — Simplified representation of centre holes

The European Standard EN ISO 6411:1997 has the status of a
British Standard

ICS 01.100.20

National foreword

This British Standard is the English language version of EN ISO 6411:1997. It is identical with ISO 6411:1982. It partially supersedes BS 308-1:1993. It is envisaged that when the full range of European Standards on technical drawing is implemented BS 308 will be withdrawn.

The UK participation in its preparation was entrusted to Technical Committee TDE/4, Engineering drawing, Metrology, Precision measurement and all related documentation, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN ISO title page, page 2, the ISO title page, page ii, pages 1 to 5 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 December 1997

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Amd. No.	Date	Comments

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English version

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(ISO 6411:1982)

Dessins techniques — Représentation
simplifiée des trous de centre
(ISO 6411:1982)

Technische Zeichnungen — Vereinfachte
Darstellung von Zentrierbohrungen
(ISO 6411:1982)

This European Standard was approved by CEN on 12 September 1997.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 10 “*Technical drawings, product definition and related documentation*” of the International Organization for Standardization (ISO) has been taken over as an European Standard by CEN/CS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 6411:1982 has been approved by CEN as a European Standard without any modification.

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Technical drawings — Simplified representation of centre holes

Dessins techniques — Représentation simplifiée des trous de centre

First edition — 1982-04-15

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

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:

Australia	France	Poland
Austria	Germany, F. R.	Romania
Belgium	India	South Africa, Rep. of
Brazil	Italy	Spain
Canada	Japan	Sweden
China	Korea, Dem. P. Rep. of	Switzerland
Czechoslovakia	Korea, Rep. of	United Kingdom
Denmark	Mexico	USA
Finland	Norway	USSR

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

Netherlands

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 micro-copying¹⁾*.

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,

- 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.

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 hole²⁾, 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.

¹⁾ At present at the stage of draft.

²⁾ 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 1 — Representation and designation of centre holes on drawings

Dimensions in millimetres

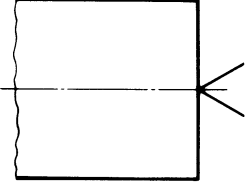
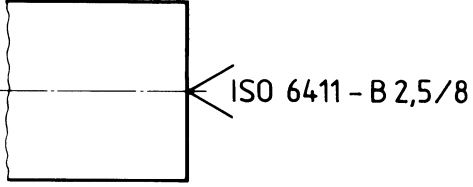
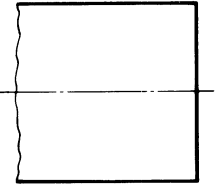
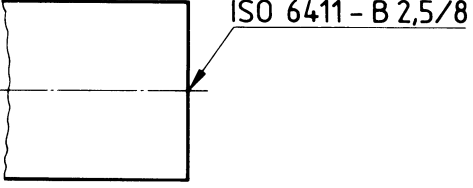
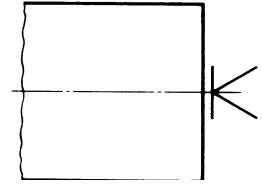
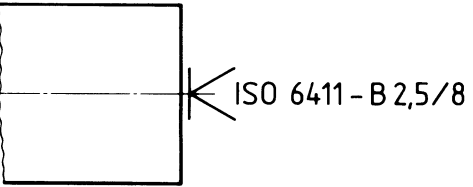
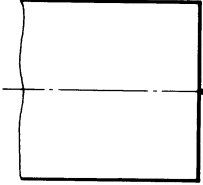
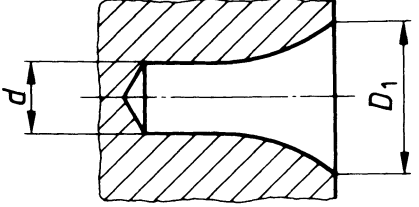
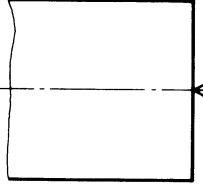
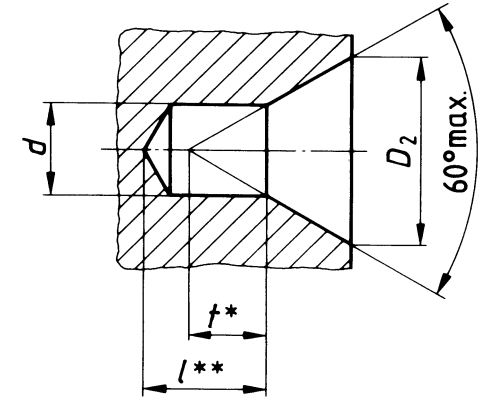
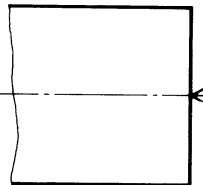
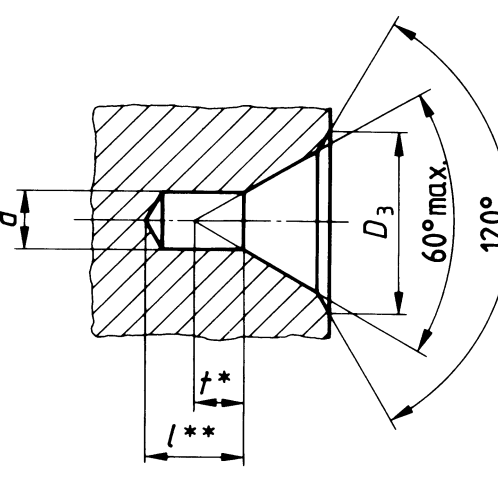
Requirement	Representation	Designation
Centre hole is required on the finished part		
Centre hole may remain on the finished part		
Centre hole shall not exist on the finished part		

Table 2 — Interpretation of the designation

Dimensions in millimetres

Type of centre hole	Designation (examples)	Interpretation of the designation
<p>R with radius form</p> <p>(centre drill according to ISO 2541)</p>	 <p>ISO 6411 - R 3,15/6,7</p>	 <p>$d = 3,15$ $D_1 = 6,7$</p>
<p>A without protecting chamfer</p> <p>(centre drill according to ISO 866)</p>	 <p>ISO 6411 - A 4/8,5</p>	 <p>$d = 4$ $D_2 = 8,5$</p>
<p>B with protecting chamfer</p> <p>(centre drill according to ISO 2540)</p>	 <p>ISO 6411 - B 2,5/8</p>	 <p>$d = 2,5$ $D_3 = 8$</p>
<p>* For dimension t, see Annex A. ** Dimension t depends on the length of the centre drill. It should not be less than t.</p>		

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

<i>d</i> nom.	Type				
	R according to ISO 2541	A according to ISO 866		B according to ISO 2540	
	<i>D</i> ₁ nom.	<i>D</i> ₂ nom.	<i>t</i> ref.	<i>D</i> ₃ nom.	<i>t</i> 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

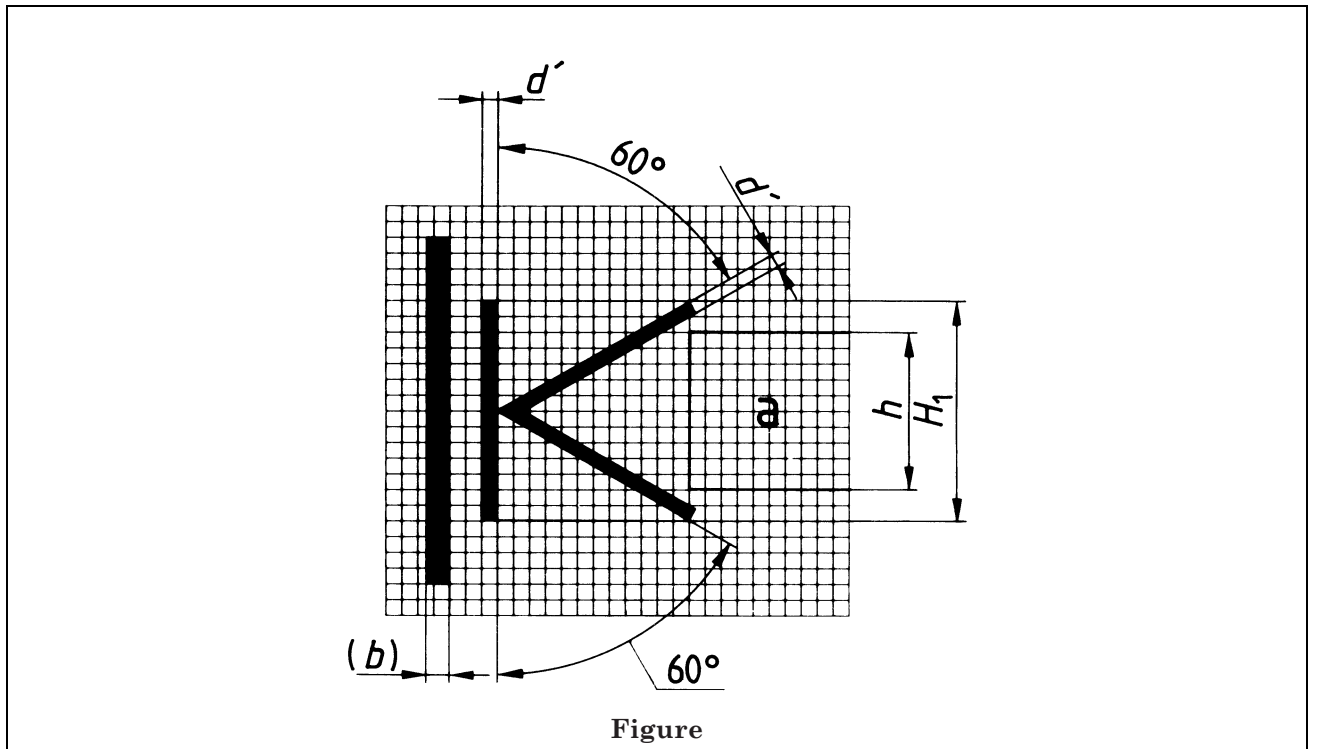
The symbol and its complements shown in area **a** (see **B.3**) shall be drawn in accordance with the Figure.

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 (<i>b</i>)	0,5	0,7	1	1,4	2	2,8
Height of numerals and capital letters (<i>h</i>)	3,5	5	7	10	14	20
Line thickness for symbols (<i>d'</i>)	0,35	0,5	0,7	1	1,4	2
Line thickness for lettering (<i>d</i>)	see B.1.2					
Height <i>H</i> ₁	5	7	10	14	20	28



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