इंटरनेट मानक

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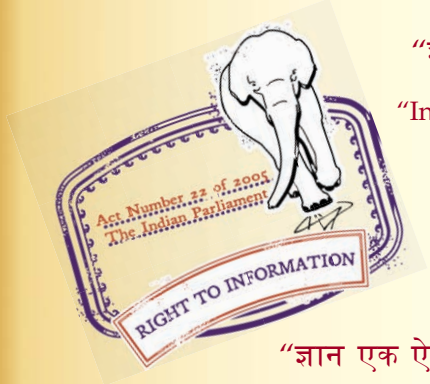
"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS/ISO 13715 (1994): Technical Drawings - Corners - Vocabulary and Indication on Drawings [PGD 24: Drawings]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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भारतीय मानक

तकनीकी ड्राइंग — कोने — शब्दावली व ड्राइंग पर अभिसूचन चिह्न

Indian Standard

TECHNICAL DRAWINGS — CORNERS — VOCABULARY AND INDICATION ON DRAWINGS

!CS 01.100

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELH1110002

October 1996

Price Group 7

Drawings Sectional Committee, LM 02

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 13715 : 1994 'Technical drawings — Corners — Vocabulary and indication on drawings', issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendation of the Drawings Sectional Committee and approval by the Light Mechanical Engineering Division Council.

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

a) Comma (,) has been used as a decimal marker while in Indian Standards the current practice is to use a point (.) as the decimal marker.

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

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exists. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 128:1982	IS 10714 :1983 General principles of presentation on technical drawings	Identical
ISO 129 : 1985	IS 11669 : 1986 General principles of dimensioning on technical drawings	Identical

The concerned technical committee has reviewed the provisions of ISO 3461-2 :1987 referred in this adopted standard and has decided that the same is acceptable for use in conjunction with this standard.

Indian Standard

TECHNICAL DRAWINGS — CORNERS — VOCABULARY AND INDICATION ON DRAWINGS

1 Scope

This International Standard defines terms relating to states of corners and specifies rules for the non-verbai indication of states of corners of undefined shape on technical drawings.

It also specifies the proportions and dimensions of the graphical symbols used for this indication.

When a special shape of corners is required, the general dimensioning principles given in ISO 129 apply.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 128:1982, *Technical drawings — General principles of presentation.*

ISO 129:1985, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications.*

ISO 3461-2:1987, *General principles for the creation of graphical symbols — Part 2: Graphical symbols for use in technical product documentation.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 corner: Point or area of a part at which two or more surfaces meet.

3.2 uncontrolled corner: Corner with a shape which is optional, either sharp or passing or undercut or with a remaining and permitted burr.

3.3 controlled corner: Corner with a shape which is mandatory, either sharp or passing or undercut or with a remaining and required burr.

The control of corners shall make allowance for the function of the part. In case of doubt, dimensioning in accordance with ISO 129 is recommended.

3.4 burr: Rough remainder of material at a corner, left after either machining or a forming process.

3.5 part: One piece of an assembly, or several pieces joined together which are not normally subject to disassembly without destruction.

3.6 passing: External deviation, either chamfered or rounded, from the ideal geometric shape of the corner.

3.7 undercut: internal deviation, either chamfered or rounded, from the ideal geometric shape of the corner.

3.8 state of corner: Either controlled or uncontrolled shape of a corner (see figures 1 and 2 or figures 3 and 4), the. size of which shall not be exceeded in any direction (i.e. maximum dimensions).

NOTE 1 The size is determined by the dimensions a or *a* and *b* (see figures 5 to 16).

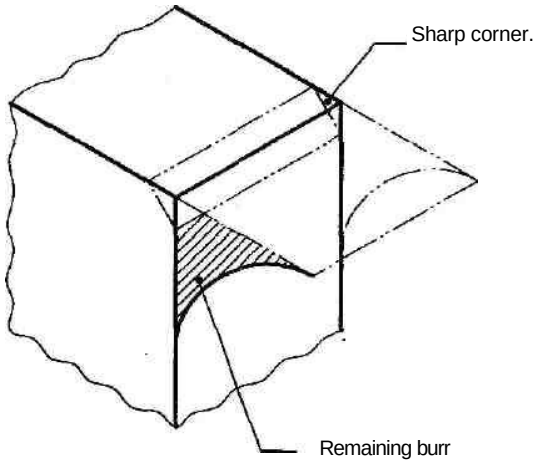


Figure 1

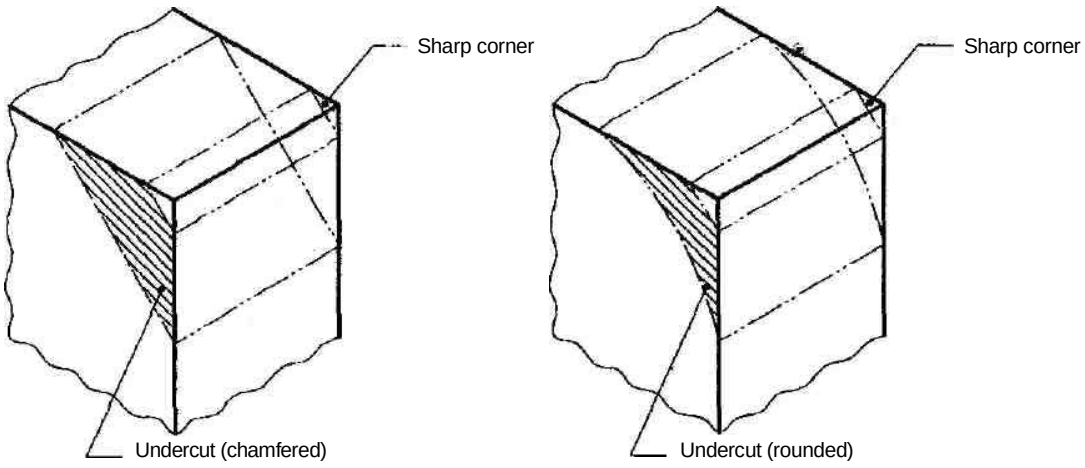


Figure 2

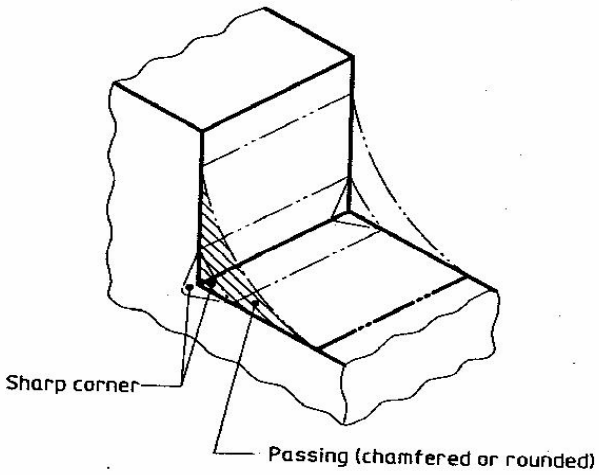


Figure 3

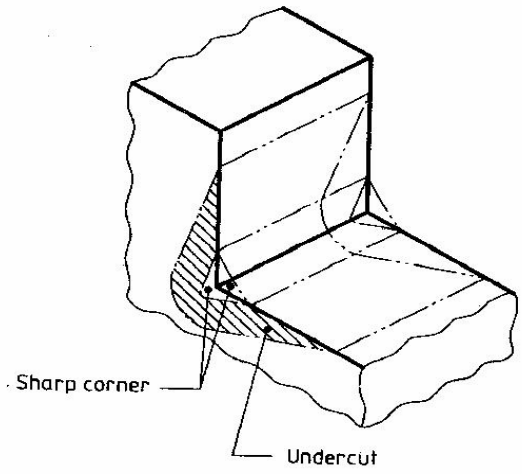


Figure 4

3.8.1 corner with burr: Controlled external corner with permitted burr which is limited in size and controlled in direction (see figures 5 to 7).

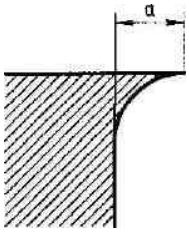


Figure 5

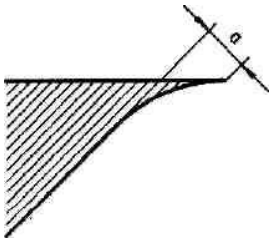


Figure 6

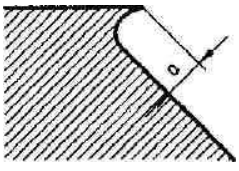


Figure 7

3.8.2 sharp corner: Controlled corner, with burr {passing) or undercut limited in size and close to zero.

NOTE 2 See table 2 for suggested limits.

3.8.3 corner without burr: Controlled external corner with undercut {chamfered or rounded); no remaining burr is permitted (see figures 8 to 11).

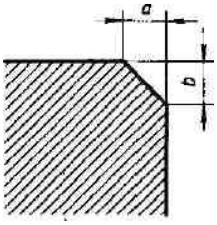


Figure 8

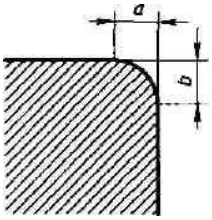


Figure 9

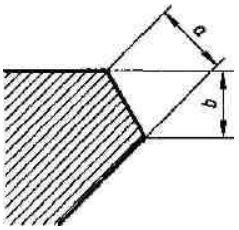


Figure 10

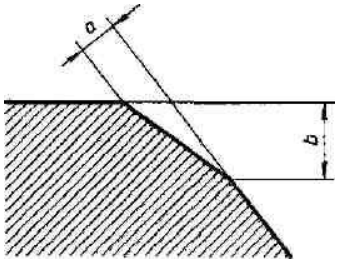


Figure 11

3.8.4 corner with passing: Controlled internal corner, either chamfered or rounded {see figures 12 to 14).

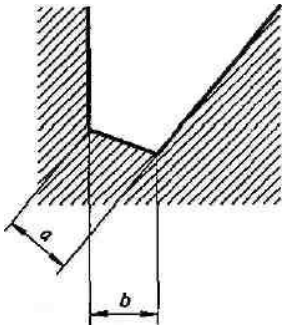


Figure 12

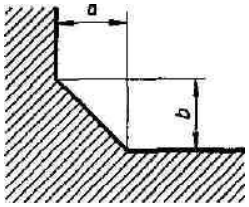


Figure 13

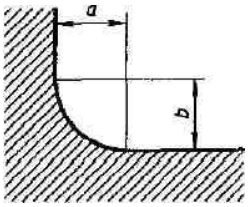


Figure 14

3.8.5 comer with undercut: Controlled internal corner, with permitted undercut limited in size and controlled in direction, but not defined in shape (see figures 15 and 16).

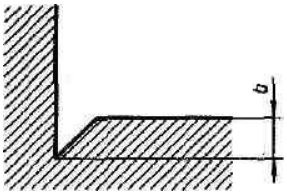


Figure 15

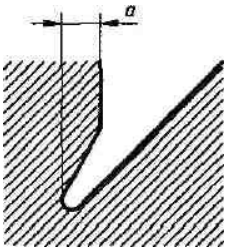


Figure 16

4 Indications on the drawing

4.1 Reference to this international Standard

It is recommended that reference be made to ISO 13715 either within or near the title block, as illustrated in figure 17,

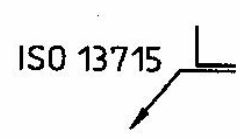


Figure 17

4,2 Basic symbol

The state of corners of a part shall be specified using the graphical symbol shown in figure 18a) and the corresponding indications of size shall be inscribed in the areas a-j, 82 or 83 defined in figure A.1. The length and direction of the reference line may be adapted to suit the characteristics of the drawing (see, for example, figure 27).

When the same state of corner is required all around a part, a circle is added to the leader line, see figure 18 b).

NOTE 3 Rules for draughting the graphical symbol are given in annex A.

Figure 18

4.3 Indication of the size and state

4.3.1 Size and state of corner

The size of the permissible state of corner, preceded by the symbol element + (plus) or - (minus) representing the state of corner in accordance with table 1, shall be indicated in the area ai (defined in figure A. 1) adjacent to the basic symbol (see, for example, figure 19).

Table 1

Symbol element	Interpretation	
	External corner	Internal corner
+	burr permitted	passing permitted
-	undercut permitted; burr not permitted	undercut permitted; passing not permitted
±	burr or undercut accepted	burr or passing accepted

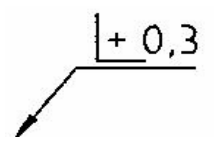


Figure 19

The state "sharp corner" shall be quantified according to the limits given in table 2. The direction of burr and the direction of undercut are not defined. The size of corner specified corresponds to the maximum dimension.

The state of corner may also be indicated without a corresponding size indication by the symbol element + or - only. The direction of burr and the direction of undercut are not controlled (see figures 20 and 21).

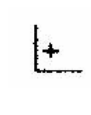


Figure 20

Figure 21

4.3.2 Direction of burr or undercut

When it is necessary to specify the permitted direction of burr on an external corner or the direction of undercut on an internal corner, the size indication shall be given in the area *&i* or 83 (as defined in figure A. 1) as appropriate (see figures 22 and 23).

Figure 22

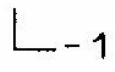


Figure 23

4.4 Size of corner

4,4.1 Recommended sizes

Recommended sizes of corner *a* and/or *b* are given in table 2.

Table 2

Dimensions in millimetres

a and/or *b*	Application
1) + 2,5 + 1 + 0,5 + 0.3 + 0,1	Corners with permitted burr or permitted chamfer/rounding
+ 0,05 + 0,02	Sharp corner
-0,02 -0,05	
-0,1 -0,3 -0,5 -1 -2,5	Corners with permitted undercut; burr not permitted
1) Additional sizes according to requirement.	

4.4.2 Upper and lower limits

When it is necessary to specify an upper and a lower limit for the size of corner, both values shall be indicated, the maximum size above the minimum size {see figures 24 to 26). Where a particular direction of burr is required, the indication shall be positioned accordingly (see 4.3:2).

Figure 24

Figure 25

Figure 26

4.5 Representation on the drawing

4.5.1 The indications may refer to the following:

i— in most cases, a corner vertical to the projection plane {see figure 27, front view);

— the periphery of a part or of a hole (see figure 27, section).

If only one view is represented, the inscription is generally also valid for all corners hidden behind the visible outlines (see figures 28 and 29). In the case of punched parts however, a distinction shall be made between the cutting side and the burring side.

NOTE 4 The cutting side will normally have undercuts, indicated by a minus sign; the burring side will then be indicated by a plus sign.

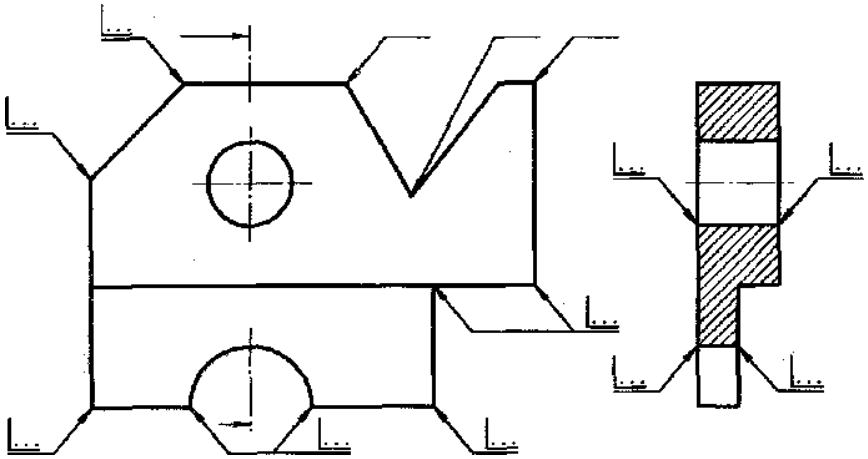


Figure 27

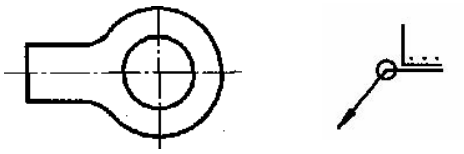


Figure 28

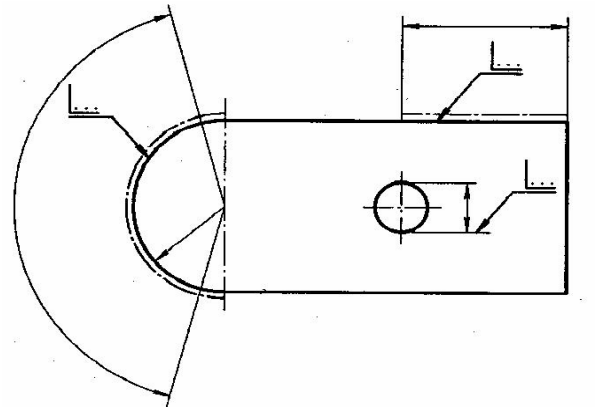


Figure 29

In conformity with ISO 129, the graphical symbol as well as the inscriptions shall be oriented so that they may be read from the bottom or the right-hand side of the drawing.[1)]

4.5.2 States of corners which are valid only for a prescribed length shall be represented by a corresponding size indication and by a chain thick line (see ISO 128, line type J) (see figure 29).

4.5.3 When the same requirement for the state of corners is valid for all corners of a part, a single indication at the appropriate position on the drawing (in accordance with 4.1) is sufficient.

4.5,3.1 Requirements which are valid for external corners only shall be indicated in accordance with figure 30, and those which are valid for internal corners only shall be indicated in accordance with figure 31.

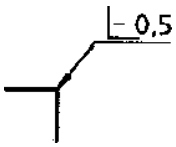


Figure 30

1) In figures 27 to 29 the position of the inscription is only an example; the indication of dimension has been suggested by three dots.

4.5.3.2 If, in addition to a general indication, it is necessary to highlight the fact that further states of corners are shown elsewhere on the drawing, this shall also be shown by placing an additional indication in parentheses next to the general indication (see figures 32 and 33).

For purposes of simplification, if more than one further state of corners is indicated in the representation, only the basic symbol shall appear in parentheses next to the general indication (see figure 34).

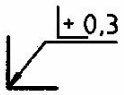


Figure 31

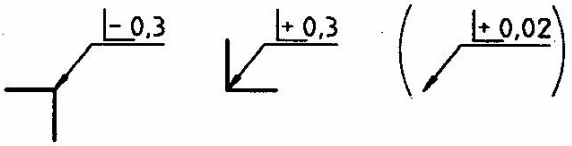


Figure 32

Figure 33

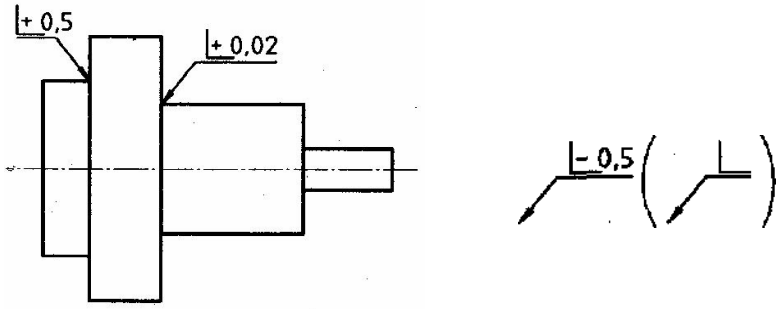
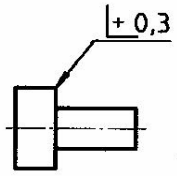
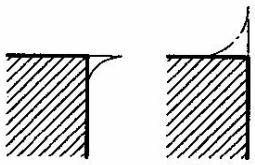
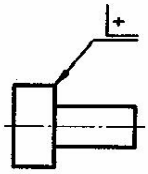
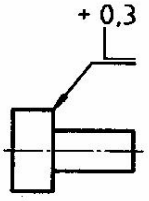
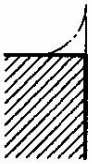
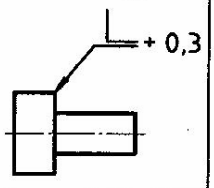
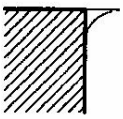
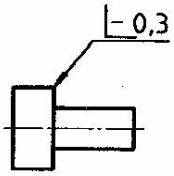
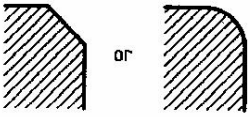
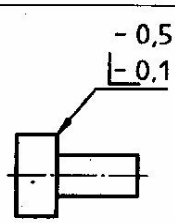
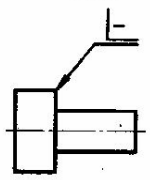


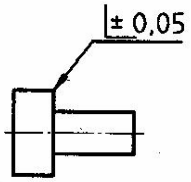
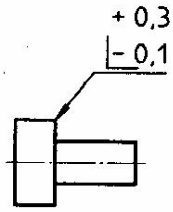
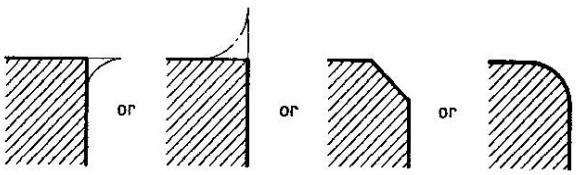
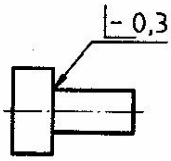
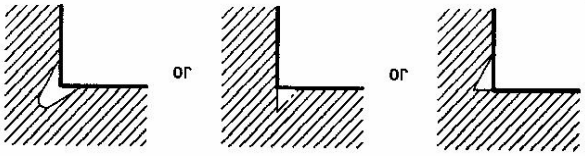
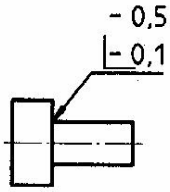
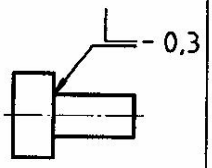
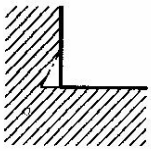
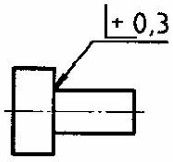
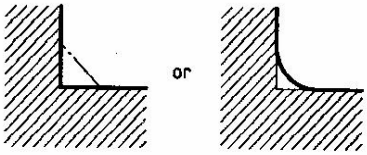
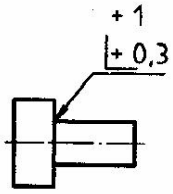
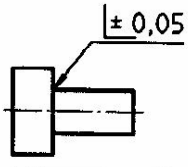
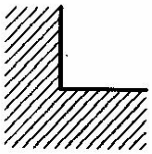
Figure 34

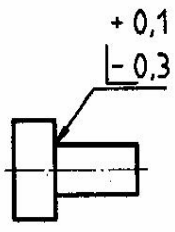
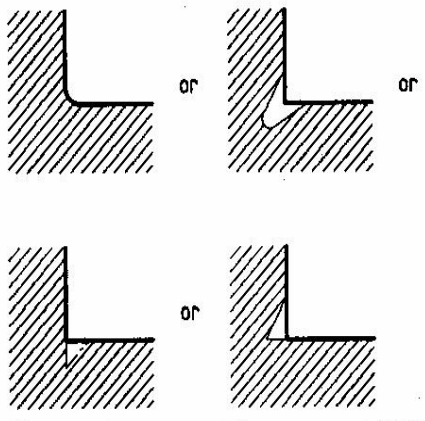
5 Examples

Examples of indications of corners are given in Tables 3

Table 3

No.	Indication	Interpretation	Explanation
5.1			External corner with acceptable burr up to 0,3 mm; direction of burr undefined
5.2			External corner with acceptable burr; size of burr and direction of burr undefined
5.3			External corner with acceptable burr up to 0,3 mm; direction of burr defined
5.4			External corner with acceptable burr up to 0,3 mm; direction of burr defined
5.5			External corner without burr; undercut up to 0,3 mm; shape undefined
5.6			External corner without burr; undercut in the zone from 0,1 mm to 0,5 mm; shape undefined
5.7			External corner without burr; shape of undercut undefined

No.	Indication	Interpretation	Explanation
5.8			External corner with acceptable burr up to 0,05 mm or without burr down to 0,05 mm (sharp edge); direction of remaining burr undefined
5.9			External corner with acceptable burr up to 0,3 mm or without burr down to 0,1 mm; direction of burr undefined
5.10			Internal corner with acceptable undercut down to 0,3 mm; direction of undercut undefined
5.11			Internal corner with acceptable undercut in the zone from 0,1 mm to 0,5 mm; direction of undercut undefined
5.12			Internal corner with acceptable undercut down to 0,3 mm; direction of undercut defined
5.13			Internal corner with acceptable passing up to 0,3 mm; shape of passing undefined
5.14			Internal corner with acceptable passing in the zone from 0,3 mm to 1 mm; shape of passing undefined
5.15			Internal corner with acceptable undercut down to 0,05 mm or with acceptable passing up to 0,05 mm (sharp edge); shape of undercut/passing undefined

No.	Indication	Interpretation	Explanation
5.16			Internal corner with acceptable passing up to 0,1 mm or with acceptable undercut down to 0,3 mm; direction of undercut undefined

Annex A
(normative)

Proportions and dimensions of graphical symbols

A.1 General requirement

In order to harmonize the size of the graphical symbols specified *in* this International Standard with the sizes of other indications on the drawing (dimensions, tolerances, etc.) the rules given in ISO 3461-2 shall be observed.

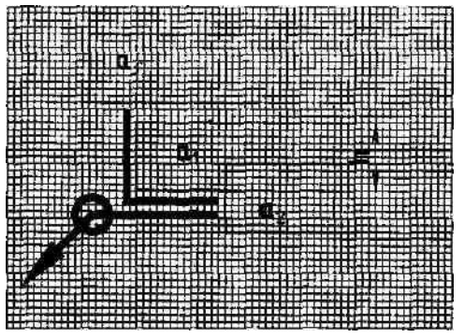


Figure A.1

A.2 Proportions

The graphical symbols and the additional indications in the areas a 1 to 83 shall be draughted in accordance with figure A. T.

If area at is filled, the reference portion of the leader line shall be as long as the indication (see figure 19).

A.3 Dimensions

The dimensional requirements of the graphical symbols and the additional indications are specified in table A.1.

Table A.1

Dimensions in millimetres

Lettering height, *h*	3.5	5	7	10	14
Line thickness for symbols and lettering, *d*	0,35	0,5	0,7	1	1.4

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