INTERNATIONAL STANDARD

ISO 13715

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Technical drawings — Corners — Vocabulary and indication on drawings

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Dessins techniques — Arêtes — Vocabulaire et indication sur les dessins

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Reference number
ISO 13715:1994(E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 13715 was prepared by Technical Committee ISO/TC 10, *Technical drawings, product definition and related documentation*, Subcommittee SC 6, *Mechanical engineering documentation*.

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Annex A forms an integral part of this International Standard.

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Introduction

In technical drawings the ideal geometric shape is represented without any deviation, and therefore in general the states of the corners are not considered. However, for many purposes (for example for the functioning of the part or for safety reasons) particular states of edges are required, such as external corners which are free from burr, sharp-edged or with a burr of limited size, and internal corners with a passing. Therefore, as a general rule, all corners of parts should be produced in one of these states. However, unless a specific indication is given on a technical drawing or in associated documents that particular processes are to be carried out, the part will be delivered direct from the machine without further treatment. To avoid this situation, this International Standard has been prepared so that it is possible to indicate well-defined states of corners on technical drawings.

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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-verbal 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.

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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).

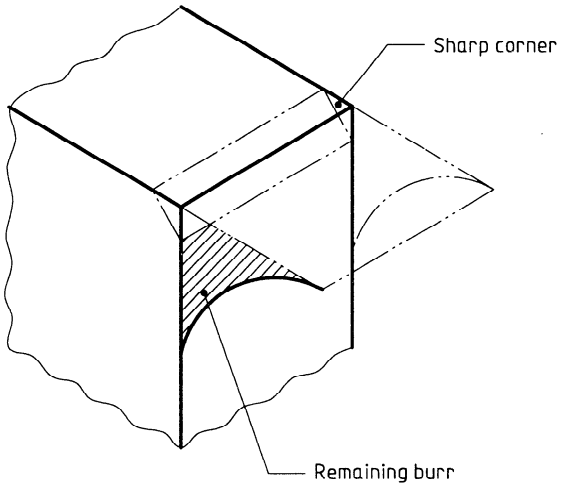

Figure 1

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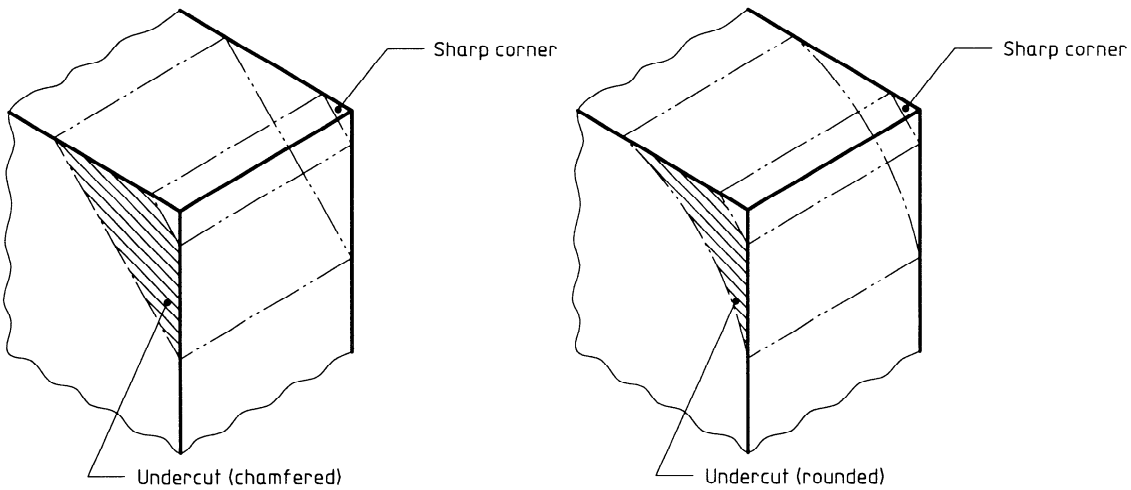

Figure 2

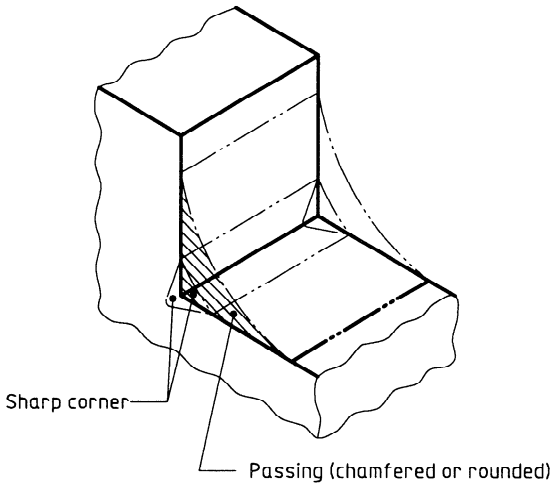

Figure 3

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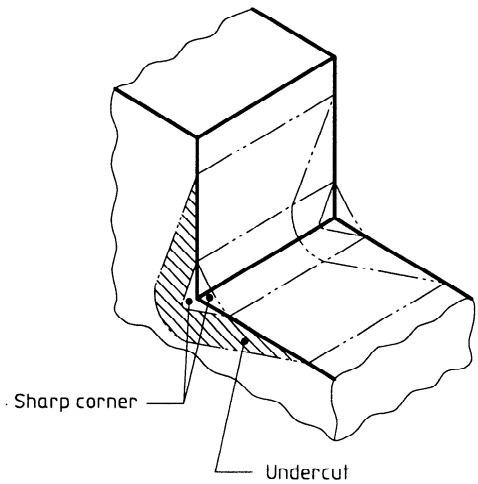

Figure 4

© ISO

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).

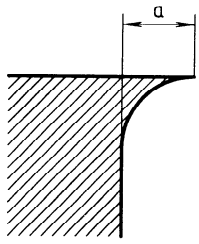

Figure 5

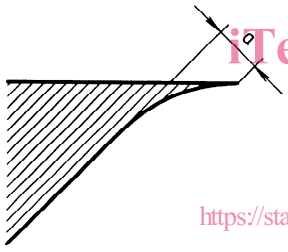

Figure 6

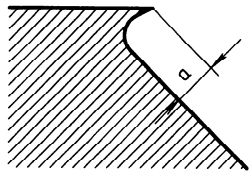

Figure 7

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).

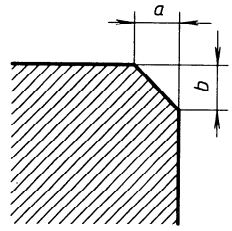

Figure 8

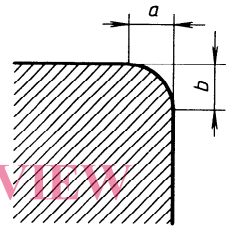

Figure 9

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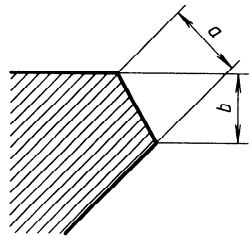

Figure 10

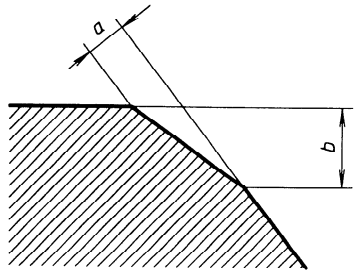

Figure 11

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

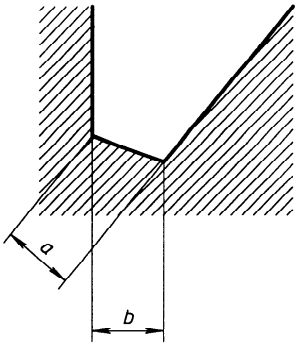

Figure 12

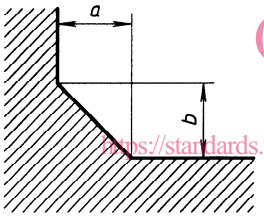

Figure 13

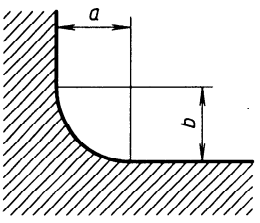

Figure 14

3.8.5 corner 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).

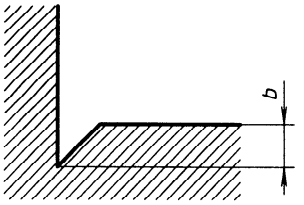

Figure 15

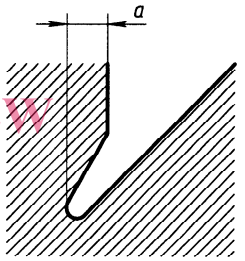

Figure 16

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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.

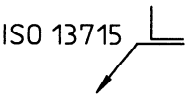

Figure 17

4.2 Basic symbol

The state of corners of a part shall be specified using the graphical symbol shown in figure 18 a) and the corresponding indications of size shall be inscribed in the areas a_1, a_2 or a_3 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.

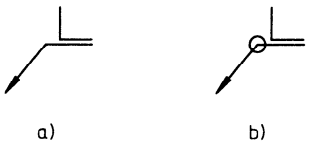

Figure 18

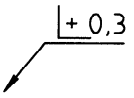

Figure 19

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

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4.3 Indication of the size and state

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Figure 21

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 a_1 (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

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 a_2 or a_3 (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 1)	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

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4.5 Representation on the drawing

4.5.1 The indications may refer to the following:

— 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.