BS ISO 13715:2017

BSI Standards Publication

Technical product documentation — Edges of undefined shape — Indication and dimensioning

bsi.

National foreword

This British Standard is the UK implementation of ISO 13715:2017. It supersedes BS ISO 13715:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee TDW/4, Technical Product Realization.

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

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Technical product documentation — Edges of undefined shape — Indication and dimensioning

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 6, *Mechanical engineering documentation*.

This third edition cancels and replaces the second edition (ISO 13715:2000), which has been technically revised with the following changes:

— title changed from *Technical drawings — Edges of undefined shape — Vocabulary and indications* to *Technical product documentation — Edges of undefined shape —Indication and dimensioning*;

— Normative references updated;

— text rearranged in Clause 4;

— figure titles changed;

— figures added and improved;

— 4.4.2 "Asymmetrical indications" added;

— Clause 5 deleted and Table 2 "Examples" is moved to Annex B, explanations have been improved;

— Annex B "Recommended edge sixe" has been deleted, definition of sharp edge is deleted.

Introduction

In technical drawings, the ideal geometric shape is represented without any deviation and, in general, without consideration of the conditions of the edges. Nevertheless, for many purposes (the functioning of a part or out of safety considerations, for example) particular conditions of edges need to be indicated. Such conditions include those of external edges free from burr or those with a burr of limited size, and internal edges with a passing.

This document provides a symbology for the indication of the desired edge.

Technical product documentation — Edges of undefined shape — Indication and dimensioning

1 Scope

This document specifies rules for the indication and dimensioning of undefined edges in technical product and dimensions. The proportions and dimensions of the graphical symbols to be used are also specified.

In cases where the geometrically defined shape of an edge (for example, 1 × 45°) is required, the general dimensioning principles given in ISO 129-1 apply.

2 Normative references

There are no normative references cited in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
edge of undefined shape
transition line, included in an intersection plane, which is not defined on the nominal model and which exists between two adjacent integral surfaces

3.2
undercut
deviation inside the ideal geometrical shape of an edge defined by two tangent outside straight lines to the adjacent feature of the zone of the undefined edge

Note 1 to entry: The explanation of the definition is given in Figures 1 and 3. In order to simplify the illustration, only the undercut and the two tangents outside straight lines are represented.

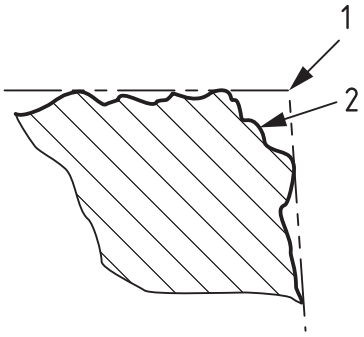
Note 2 to entry: Examples are presented in Figures 2 and 4.

3.3
passing
deviation outside the ideal geometrical shape of an edge defined by two tangent outside straight lines to the adjacent feature of the zone of the undefined edge

Note 1 to entry: The explanation of the definition is given in Figures 5 and 7. In order to simplify the illustration, only the passing and the two tangents outside straight lines are represented.

Note 2 to entry: A burr or a flash (see Figure 5) can be considered to be a special case of external passing.

Note 3 to entry: Examples are presented in Figures 6 and 8.



Key

1 ideal sharp edge

2 undercut

Figure 1 — Undercut on an external edge

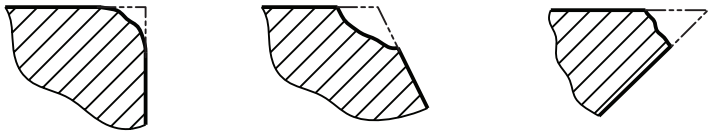
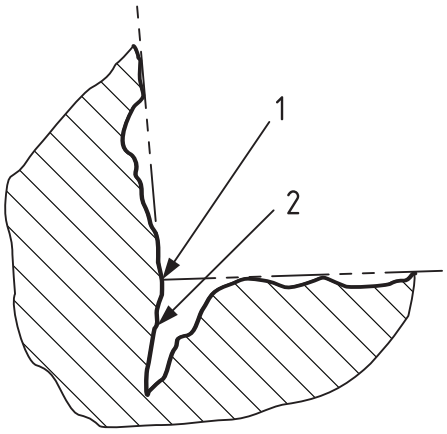


Figure 2 — Examples of undercut on an external edge



Key

1 ideal sharp edge

2 undercut

Figure 3 — Undercut on an internal edge

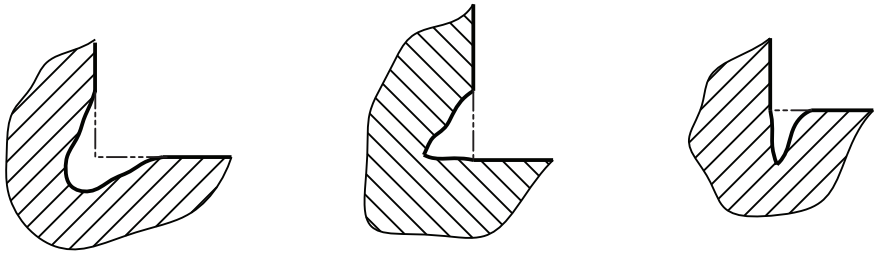
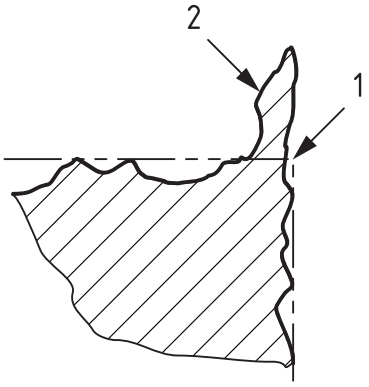


Figure 4 — Examples of undercut on an internal edge



Key

1 ideal sharp edge
2 passing

Figure 5 — Passing on an external edge (flash or burr)

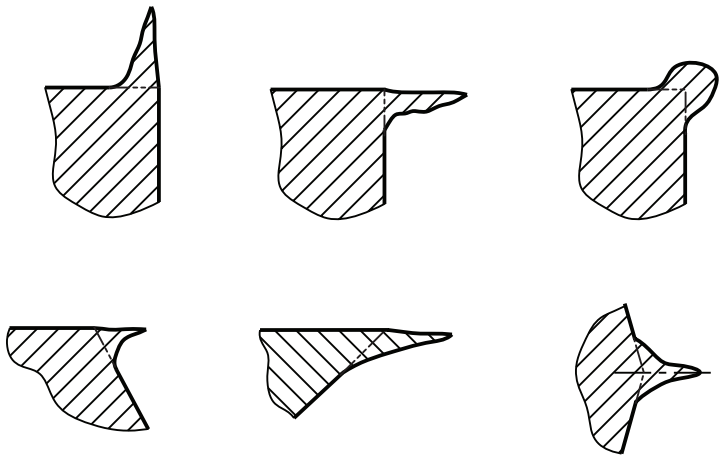
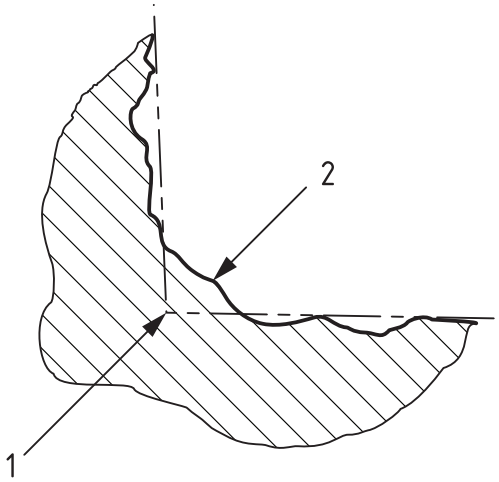


Figure 6 — Examples of passing on external edge (burr or flash)



Key

1 ideal sharp edge

2 passing

Figure 7 — Passing on an internal edge

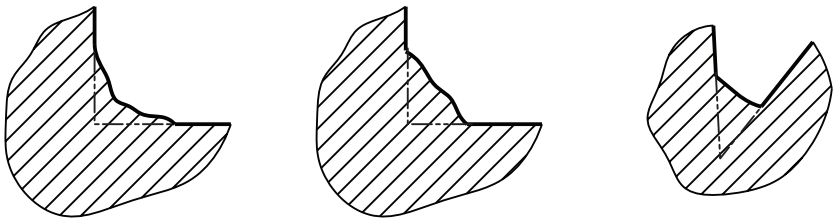


Figure 8 — Examples of passing on an internal edge

4 Indications on drawings

4.1 Basic indication

The requirements for an edge of a part shall be indicated by the basic graphical indication shown in Figure 9. If all edges of a part are to be specified as undefined, the basic general indication is used (see Figure 10).

The graphical symbol and the specification shall be represented in such a way that they can be read from the bottom of the drawing.

The proportions of this symbol are given in Annex A. Additional indications can be placed in the areas a_1, a_2 or a_3, see Figure A.1.

Undefined edges cannot be described by the basic element alone. As a minimum indication, the type of undefined edge shall be specified.

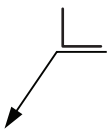


Figure 9 — Basic indication

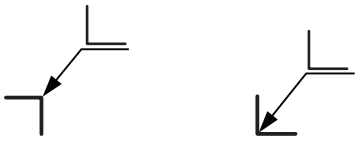


Figure 10 — Basic general indication

4.2 Types of undefined edge

The type of an undefined edge shall be indicated in the area a_1 (see Figure A.1), inside the basic symbol. The symbol element + (plus), - (minus) or ± (plus or minus) is used in accordance with Table 1.

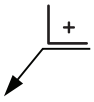
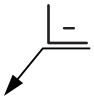
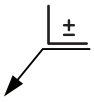
The symbol element + (plus) indicates permitted excess material, i.e. passing.

The symbol element – (minus) indicates required material removal, i.e. undercut.

The symbol element ± (plus or minus) indicates permitted excess material or material removed, i.e. an undercut or a passing. This can only be used with an indication of size (see 4.3).

The deviation from ideal nominal shape can be controlled by indicating the size of passing and undercut (see 4.3) and the direction (see 4.4).

Table 1 — Symbols for the shapes of edges

Symbol	Meaning			
	External edge		Internal edge	
	Passing	Undercut	Passing	Undercut
	Permitted	Not permitted	Permitted	Not permitted
	Not permitted	Required	Not permitted	Required
 Can only be used with an indication of size.	Permitted	Permitted	Permitted	Permitted

4.3 Size

The maximum deviation of the undercut or passing shall be controlled by indication of the dimensions (size). The value is placed after the symbol element +, - or ± in the area a_1 (see Figure A.1).

When a single limit for the size of an edge is specified with a positive value, the second limit deviation is the value zero; undercut is not permitted (see Figures 11 and 12).

When a single limit for the size of an edge is specified with a negative value, the second limit deviation is the value zero; passing is not permitted (see Figures 11 and 12).

Whenever the specification of an upper and lower limit deviation for the size of an edge is necessary, both values shall be indicated. The upper limit deviation is placed above the lower limit deviation (see Figure 13). The indicated limit deviations correspond to the maximum and minimum dimensions, respectively.

When a particular direction of passing or undercut is required, the indication shall be positioned accordingly (see 4.4).

NOTE The thickness of passing on external edges and the thickness of undercuts on internal edges cannot be specified according to this document.

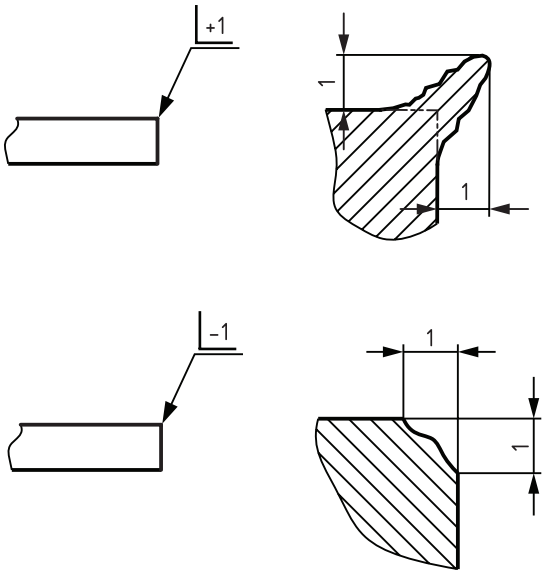


Figure 11 — Size of an external edges

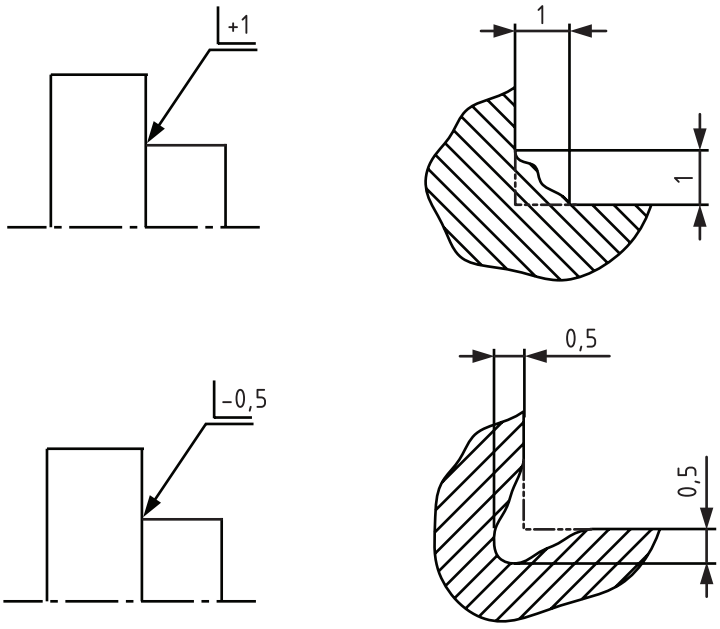


Figure 12 — Size of internal edges

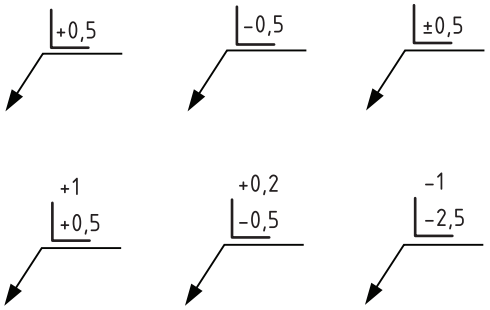


Figure 13 — Examples of indications of size

4.4 Direction of passing or undercut

4.4.1 Indication in one direction

Wherever indication of one direction of passing on an external edge or undercut on an internal edge is needed, the indication of size shall be given in the area a_2 or a_3 (see Figure A.1), accordingly (see Figures 14, 15 and 16).

Indication in one direction cannot be used for undercut on external edges and passing on internal edges.

For angles other than 90°, the direction cannot be specified.

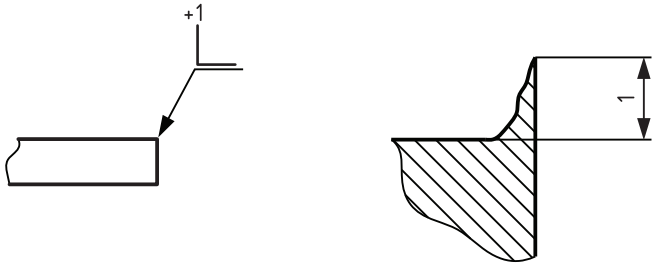


Figure 14 — Direction of the passing on an external edge

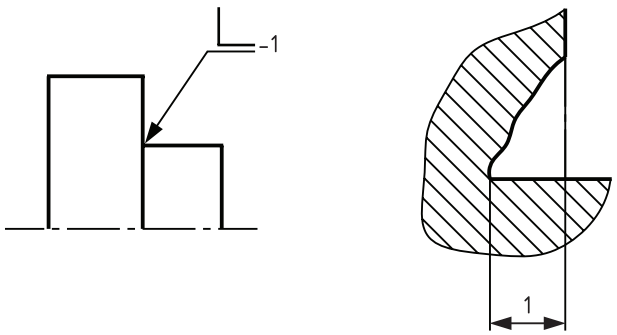


Figure 15 — Direction of the undercut on an internal edge

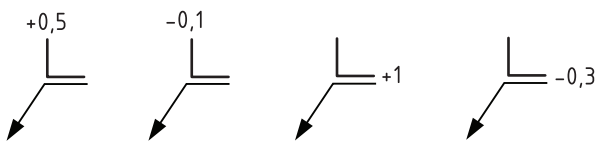


Figure 16 — Examples of indications of direction

4.4.2 Asymmetrical indication

Wherever asymmetrical indication of directions of undercut on an external edge or passing on an internal edge is needed, the indication of size shall be given in the area a_2 and a_3 (see Figure A.1), accordingly (see Figures 17, 18 and 19).

Asymmetrical indications cannot be used for passing on external edges and undercut on internal edges.

For angles other than 90°, the direction cannot be specified.

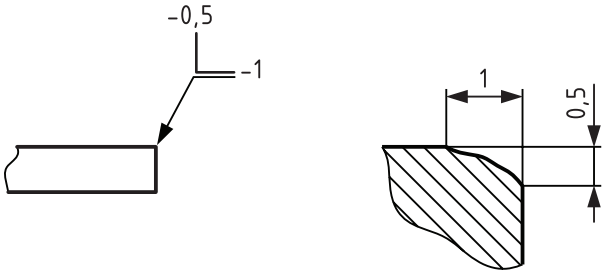


Figure 17 — Direction of undercut on an external edge

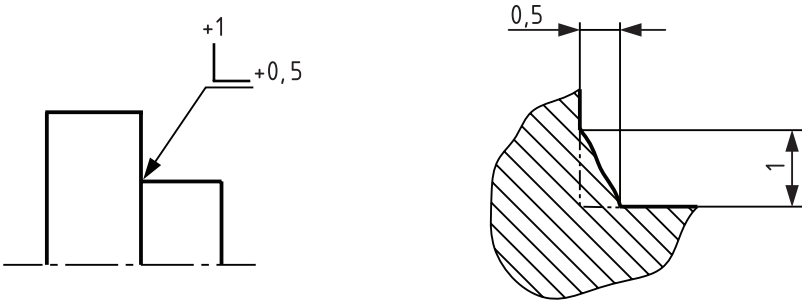


Figure 18 — Direction of the passing on an internal edge

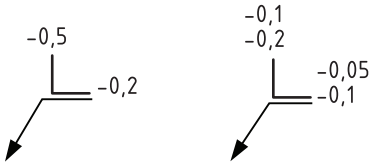


Figure 19 — Examples of asymmetrical indications of direction

4.5 Location of the basic symbol

4.5.1 General

Edges of undefined shape shall be indicated by

— an individual indication for a single edge or for all edges around the represented profile of a part,

— limited areas of the edges of the represented profile of a part, and

— general indications to not specified edges of a part.

Individual indications shall be assigned to a line (e.g. visible outlines, areas with specific treatment or extension lines), or to a point representing an edge parallel with, or vertical to, the projection plane (see Figures 20, 21 and 22).

General indications shall be indicated only once for all the edges and shall be located near the title block or in a notes area (see Figures 25 to 29 and Annex B).

4.5.2 Individual indication of edges

The following features maybe indicated:

— edges vertical to the projection plane (see Figure 20, front view);

— edges of a feature, such as a hole (see Figure 20, section);

— edges of the front and the back, if only one view is represented and the outlines of both front and back are the same (see Figure 21). If other edges exist between front and back they will be included, unless otherwise specified. Specify the quantity of edges if there is any doubt (see Figure 22) or make it clear in a separate view.

— all edges around the profile of a part represented on the drawing, if the symbol "all around" is added to the basic symbol (see Figures 21 and 22). The "all around" symbol shall not be used in sectional representations. For further information concerning the application of this symbol element, see ISO 128-22:1999, Annex B.

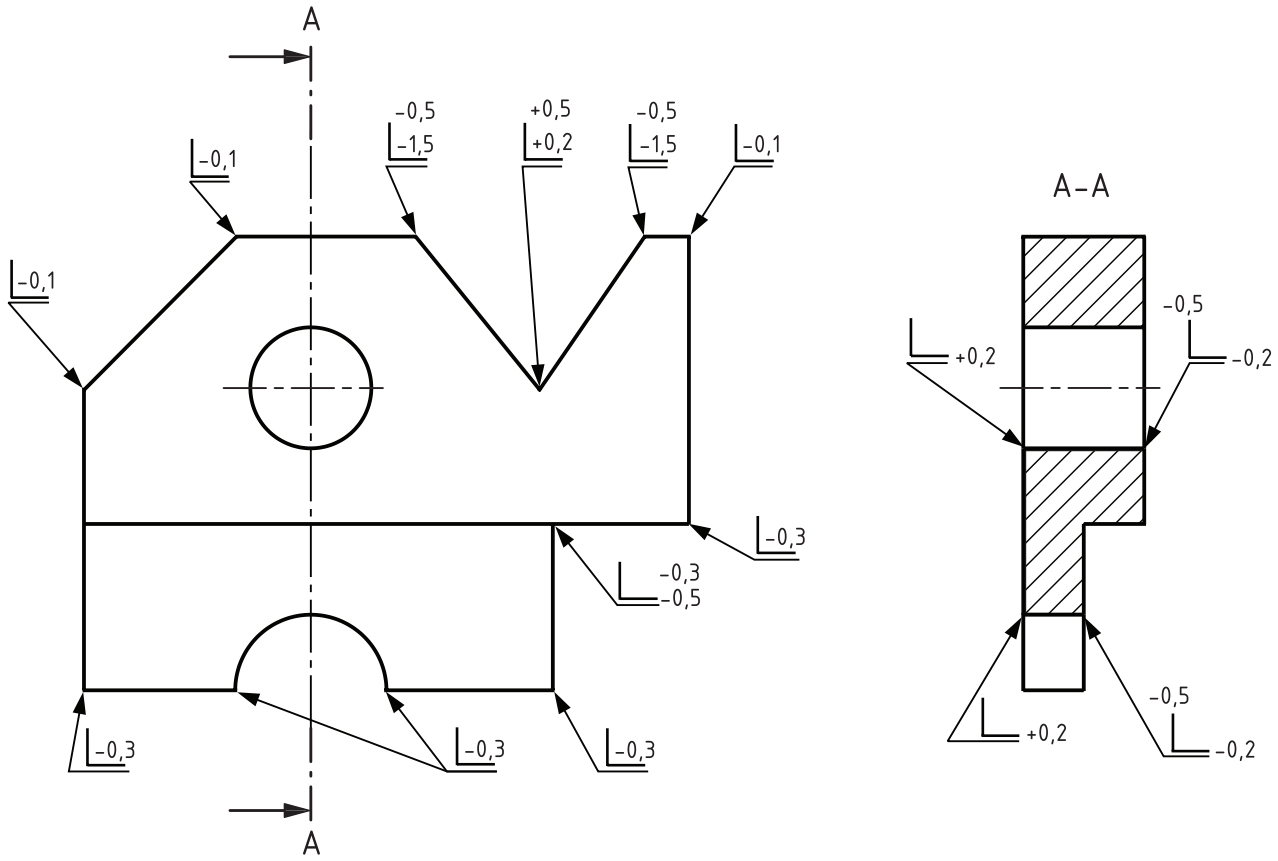


Figure 20 — Edges vertical to the projection plane

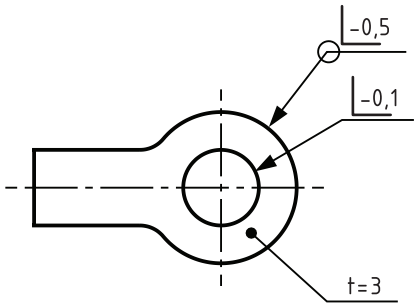


Figure 21 — Edges around the profile of a part, both sides

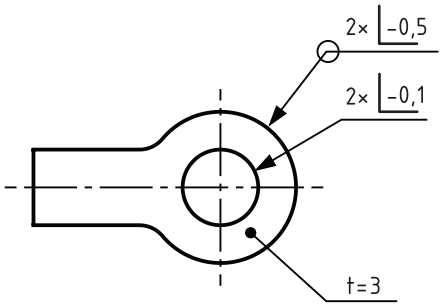


Figure 22 — Edges around a profile of a part, both sides clearly defined

4.5.3 Indication of limited areas

If the specification for the condition of an edge is valid only for a part of the length of that edge, this shall be indicated with the corresponding dimension. The limited area shall be represented by a long-dashed dotted wide line, see ISO 128-24, line type 04,2 (see Figure 23), or with the between symbol according to ISO 1101 (see Figure 24).

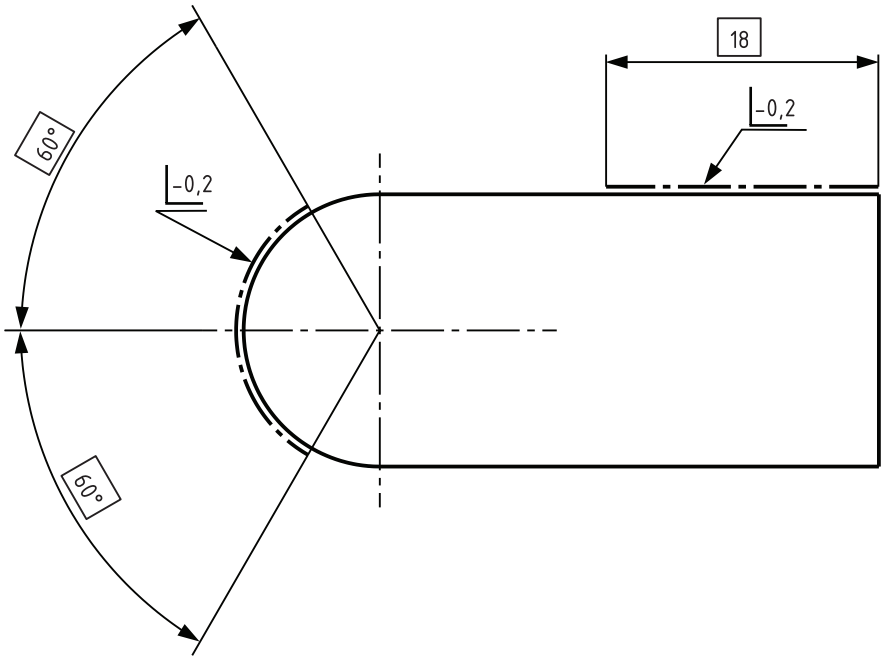


Figure 23 — Limited areas of an edge represented by long-dashed-dotted lines

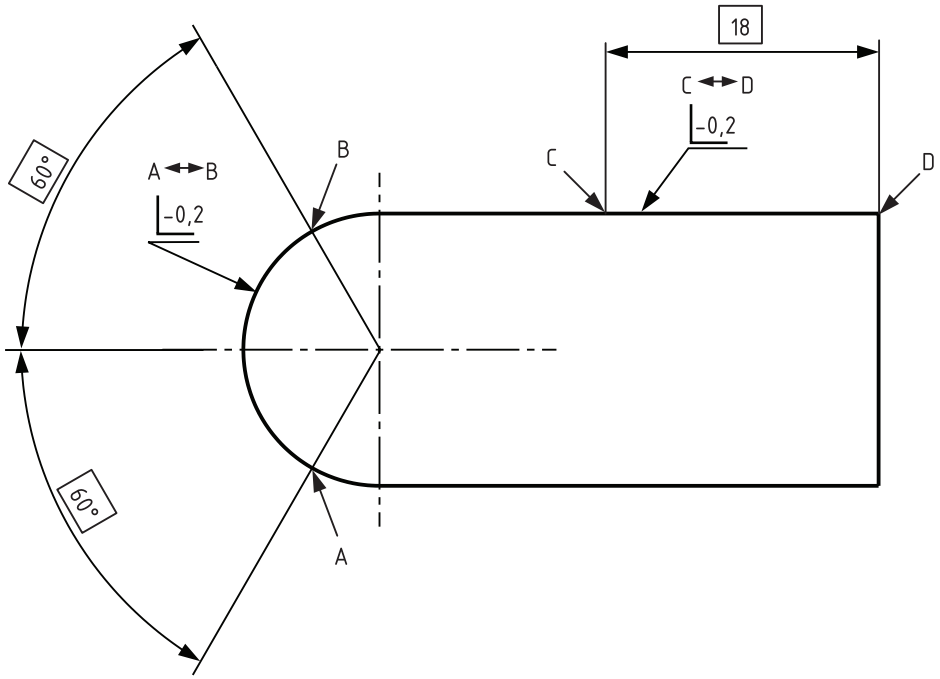
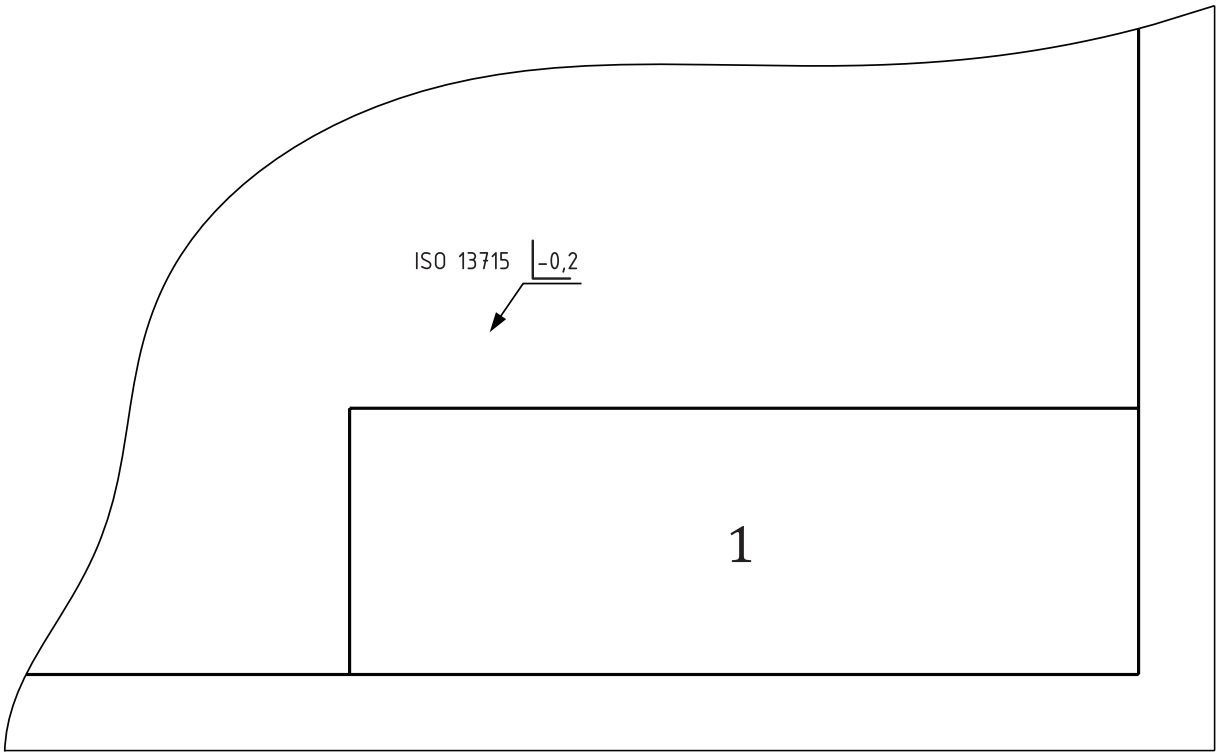


Figure 24 — Limited areas of an edge represented by between symbols

4.5.4 General indication of edges

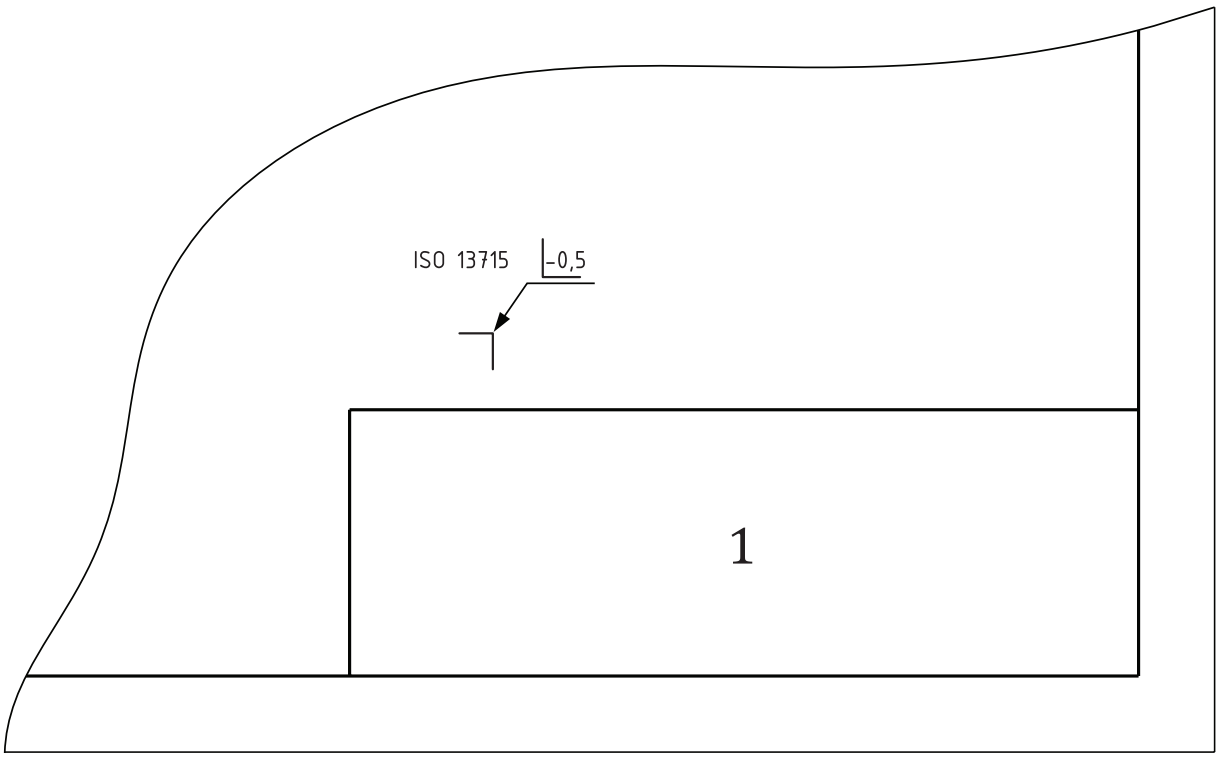
If the specification for the condition of edges is referring to all edges of a part, one general indication at the appropriate position on the drawing, near the title block or in a notes area (see Figure 25) will suffice. General indications of conditions common to only external or internal edges shall be indicated in accordance with Figures 26 and 27, respectively.



Key

1 title block

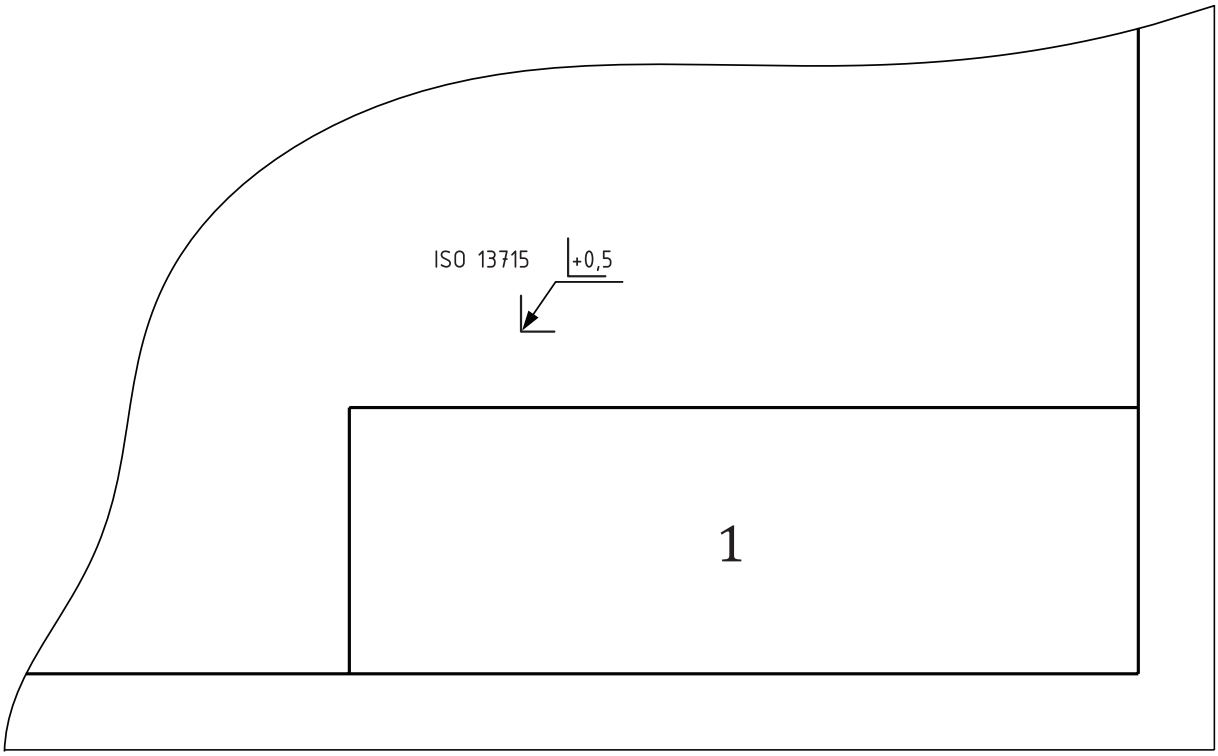
Figure 25 — Condition for all edges



Key

1 title block

Figure 26 — Condition for all external edges



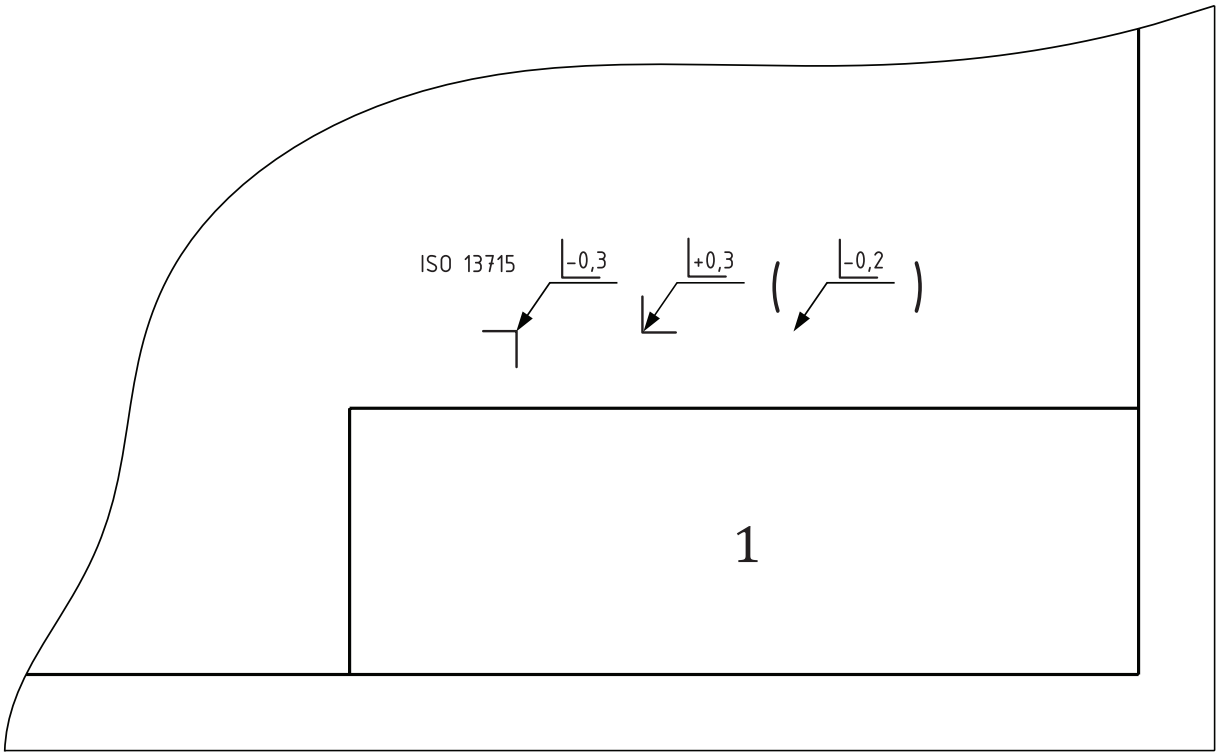
Key

1 title block

Figure 27 — Condition for all internal edges

4.5.5 Exceptions from general indications of edges

To emphasize in a general indication that another condition for some edges is required elsewhere on the drawing, an additional indication in parentheses shall be placed to the right of the general indication (see Figure 28).

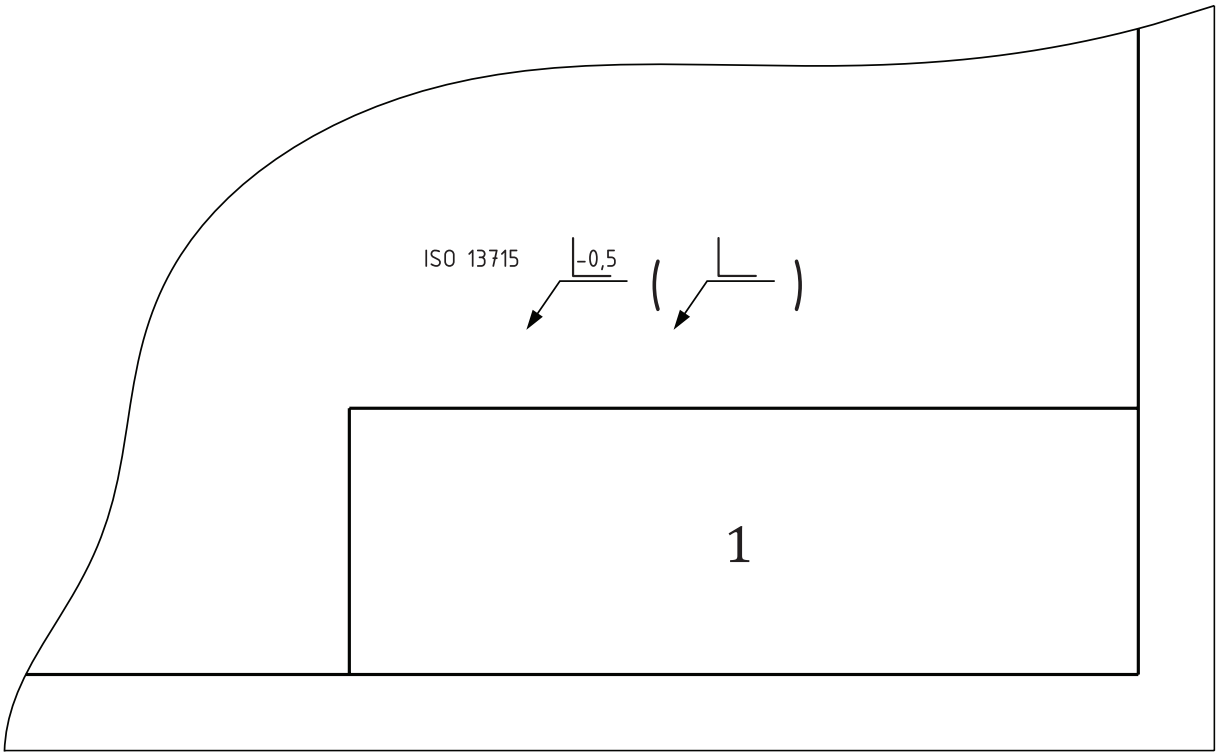


Key

1 title block

Figure 28 — External and internal edges with exception

If more than one additional requirement, only the basic symbol shall appear in parentheses to the right of the general indication (see Figure 29).



Key

1 title block

Figure 29 — Condition for all edges with more than one exception

4.6 Reference to this document

This document is to be referenced to on the drawing. The following indication as shown in Figure 30, shall be stated in or near the title block or in a notes area.

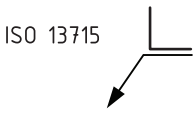


Figure 30 — Reference to this document

Annex A
(normative)

Proportions and dimensions of graphical symbols

A.1 General requirements

In order to harmonize the size of the graphical symbols specified in this document with that of the other indications on the drawing (dimensions, tolerances, etc.), observe the rules prescribed in ISO 81714-1.

Lettering shall be of the same height and line width as that used for dimensioning. The distance between lines should be twice the line width.

A.2 Proportions

The graphical symbols and the additional indications in the areas a_1 to a_3 shall be draughted in accordance with Figure A.1.

The use of the all-around symbol element is optional; the angle of the leader line will depend on the case of application. The length of the leader line should be equal to, or greater than 1,5 × *h*. If appropriate, the reference line may be extended.

A.3 Dimensions

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

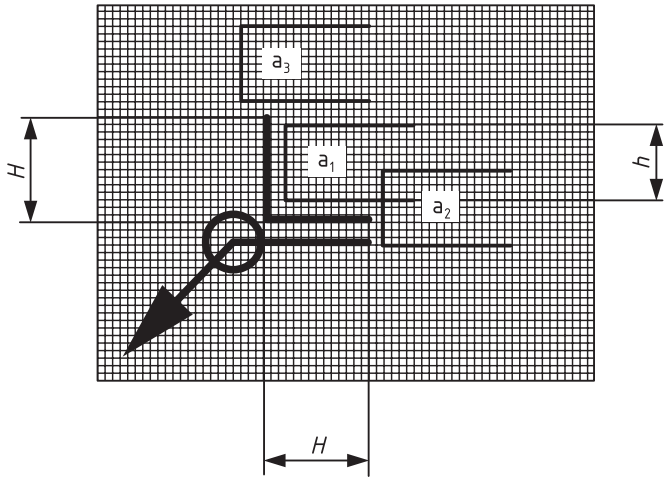


Figure A.1 — Proportions

Table A.1 — Dimensions

Dimensions in millimetres

Lettering height, *h*	3,5	5	7	10	14
Line width for symbols and lettering type B ISO 3098-1, *d*	0,35	0,5	0,7	1	1,4
Symbol height, *H*	5	7	10	14	20

Annex B
(informative)

Examples of indication of undefined edges

For examples of indication of edges, see Table B.1.

Table B.1 — Indication and associated meaning for undefined edges

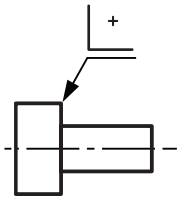
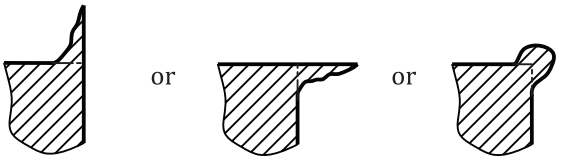
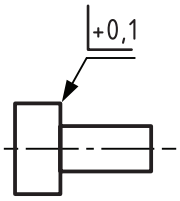
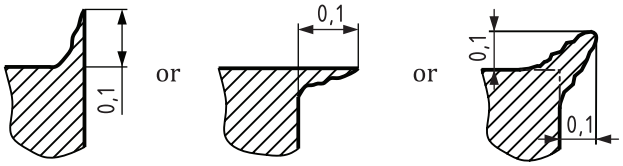
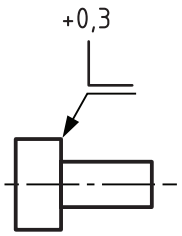
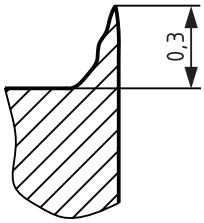
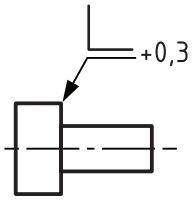
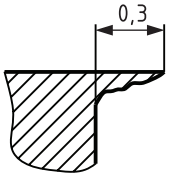
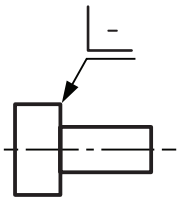
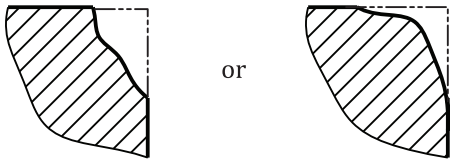
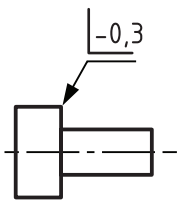
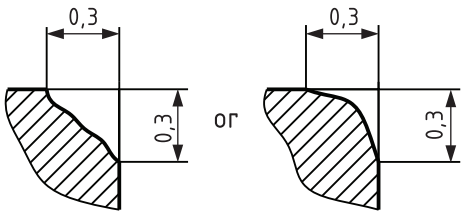
No.	Indication	Meaning	Explanation
B.1			External edge Passing permitted Size undefined Direction undefined
B.2			External edge Passing permitted Size 0 mm to 0,1 mm Direction undefined
B.3			External edge Passing permitted Size 0 mm to 0,3 mm Direction defined
B.4			External edge Passing permitted Size 0 mm to 0,3 mm Direction defined
B.5			External edge Undercut required Size undefined Direction undefined
B.6			External edge Undercut required Size 0 mm to 0,3 mm Direction undefined

Table B.1 *(continued)*

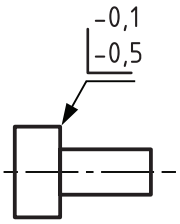
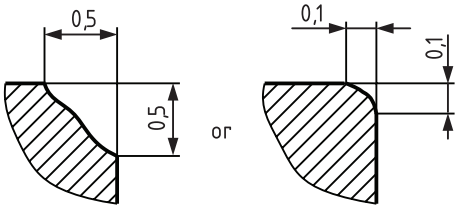
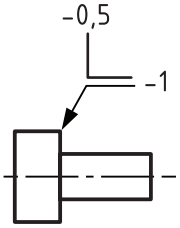
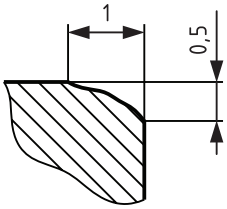
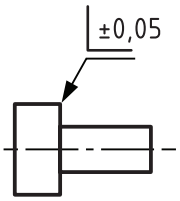
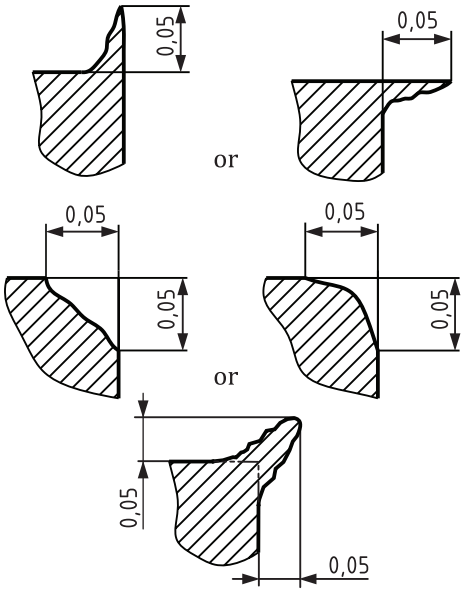
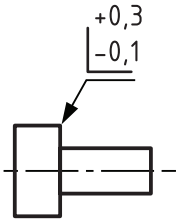
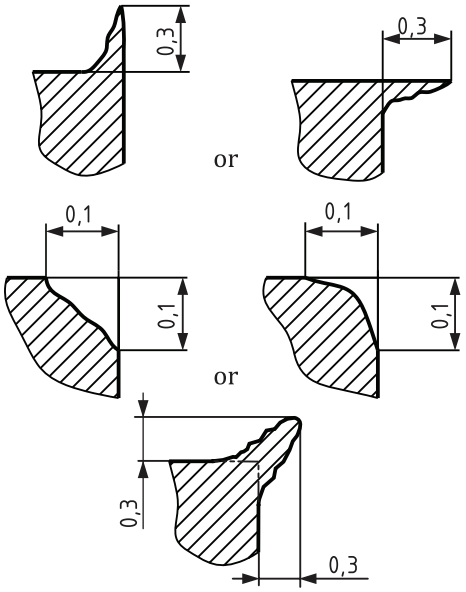
No.	Indication	Meaning	Explanation
B.7			External edge Undercut required Size 0,1 mm to 0,3 mm Direction undefined
B.8			External edge Undercut required Size 0 to 0,5 vertical Size 0 to 1 horizontal Direction defined
B.9			External edge Passing permitted Size 0 to 0,05 Undercut permitted Size 0 mm to 0,05 mm Direction undefined
B.10			External edge Passing permitted Size 0 mm to 0,3 mm Undercut permitted Size 0 mm to 0,1 mm Direction undefined

Table B.1 *(continued)*

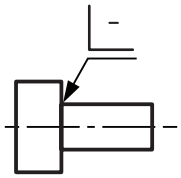
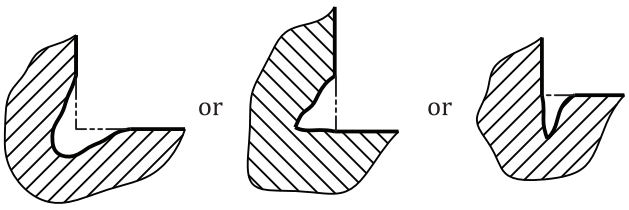
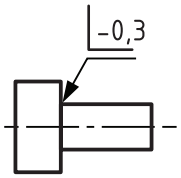
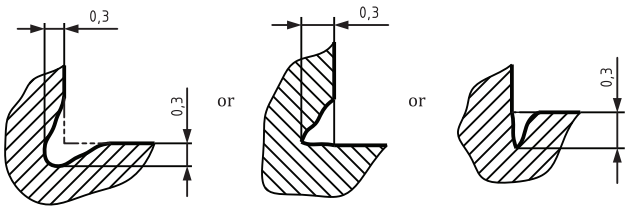
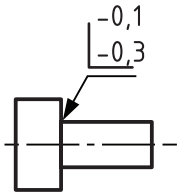
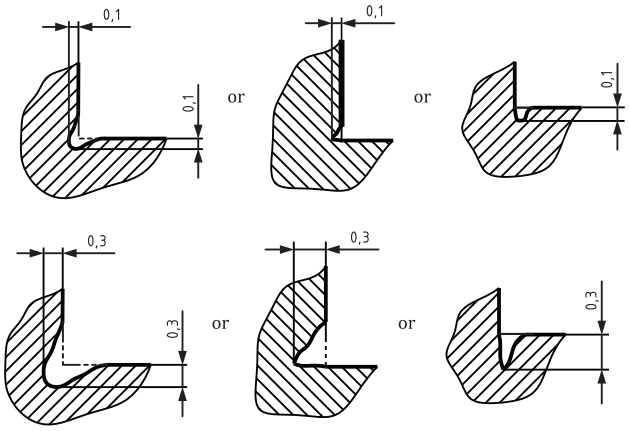
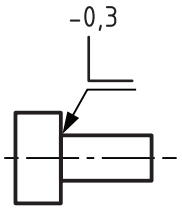
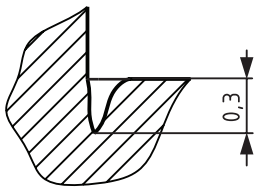
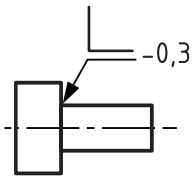
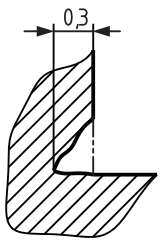
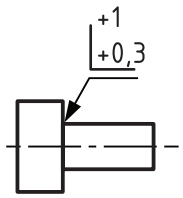
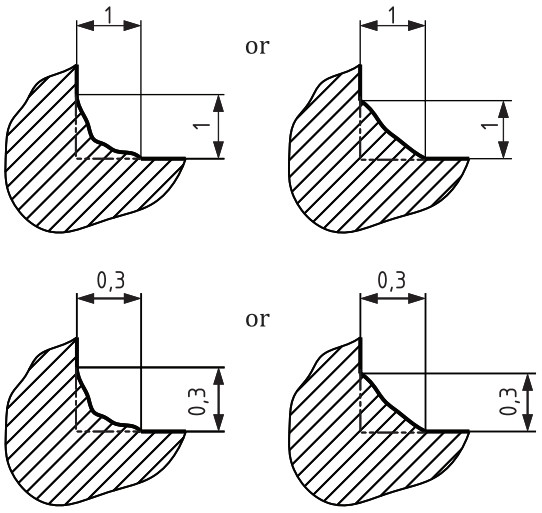
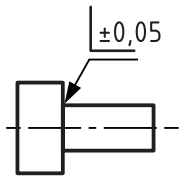
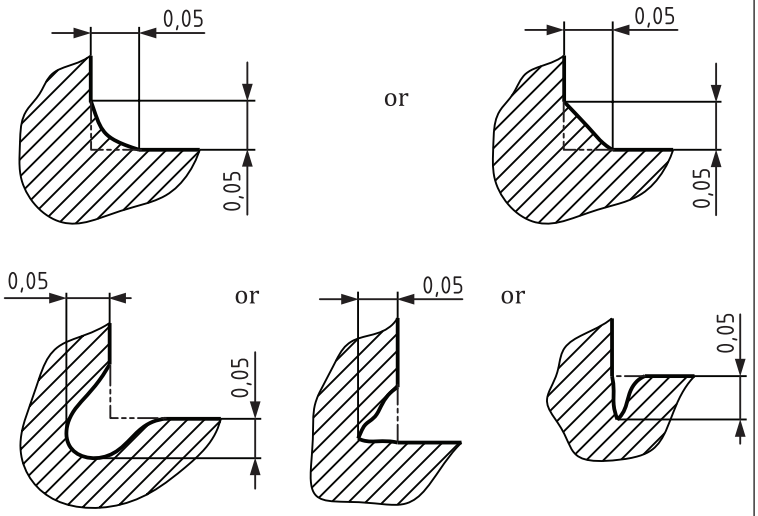
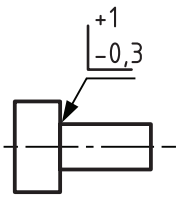
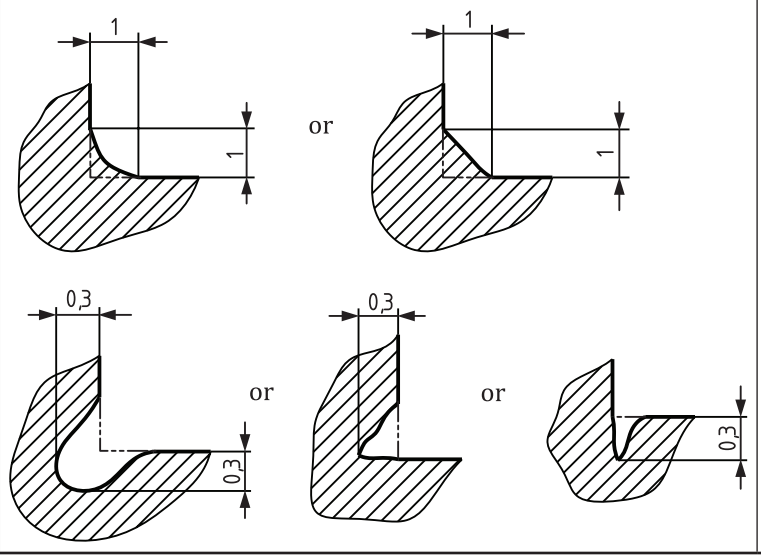
No.	Indication	Meaning	Explanation
B.11			Internal edge Undercut required Size undefined Direction undefined
B.12			Internal edge Undercut required Size 0 mm to 0,3 mm Direction undefined
B.13			Internal edge Undercut required Size 0,1 mm to 0,3 mm Direction undefined
B.14			Internal edge Undercut required Size 0 mm to 0,3 mm Direction defined
B.15			Internal edge Undercut required Size 0 mm to 0,3 mm Direction defined

Table B.1 *(continued)*

No.	Indication	Meaning	Explanation
B.16			Internal edge Passing permitted Size 0,3 mm to 1 mm Direction undefined
B.17			Internal edge Passing permitted Size 0 mm to 0,05 mm Undercut permitted Size 0 mm to 0,05 mm Direction undefined
B.18			Internal edge Passing permitted Size 0 mm to 1 mm Undercut permitted Size 0 mm to 0,3 mm Direction undefined

Bibliography

[1] ISO 128-20, *Technical drawings — General principles of presentation — Part 20: Basic conventions for lines*

[2] ISO 128-22:1999, *Technical drawings — General principles of presentation — Part 22: Basic conventions and applications for leader lines and reference lines*

[3] ISO 128-24, *Technical drawings — General principles of presentation — Part 24: Lines on mechanical engineering drawings*

[4] ISO 129-1, *Technical drawings — Indication of dimensions and tolerances — Part 1: General principles*

[5] ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

[6] ISO 3098-1, *Technical product documentation — Lettering — Part 1: General requirements*

[7] ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

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