

Edges of workpieces

Concepts Indications on drawings

DIN
6784

Werkstückkanten; Begriffe, Zeichnungsangaben

Supersedes
DIN 6784 Part 1/09.75

As it is current practice in standards published by the International Organization for Standardization (ISO), the comma has been used throughout as a decimal marker.

Dimensions in mm

1 Field of application and purpose

This standard is intended for use in technical documentation. For edge conditions of undefined form it lays down concepts and indications for use in drawings which are independent of language.

When a specific edge form is necessary, this must be dimensioned according to DIN 406 Part 2.

2 Concepts

2.1 Edge condition of the outer edge

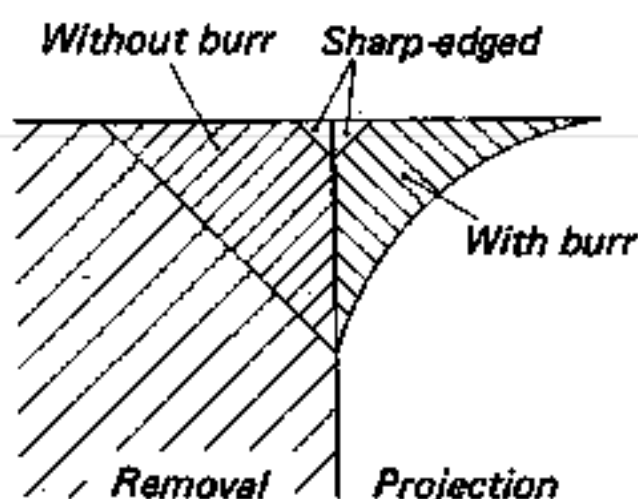


Figure 1.

2.1.1 With burr

Edge of workpiece has a projection (burr) (see figures 3, 4 and 5).

2.1.2 Sharp-edged

Edge of workpiece such that the projection or removal of material is approximately nil.

2.1.3 Without burr

Edge of workpiece with removal of material (ranging from chamfer to radiusing) (see figures 6 to 9).

2.2 Edge condition of the inner edge

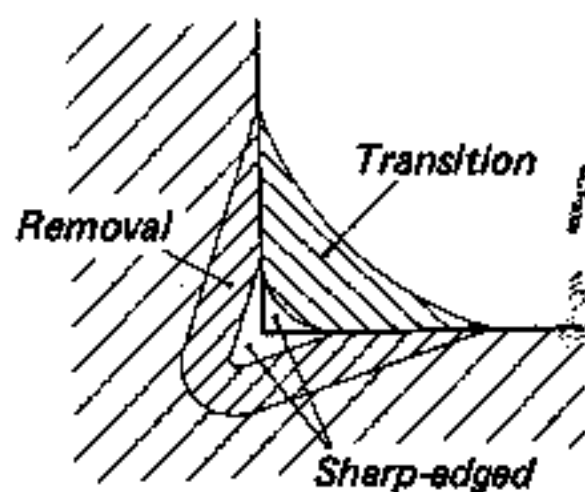


Figure 2.

2.2.1 Transition

Edge of workpiece ranging from chamfer to radiusing (see figures 10, 11 and 12).

2.2.2 Sharp-edged

Edge of workpiece such that the transition or removal of material is approximately nil.

2.2.3 Removal

Edge of workpiece with recess or re-entrant (see figures 13 and 14).

2.3 Edge region

The edge region of a workpiece is that region where the actual form of the edge is allowed to depart from the ideal geometrical, sharp-edged form. Within this region the edge form is optional.

The size of the edge region is determined by the edge dimension "a" (see figures 3 to 14). This must not be exceeded in any direction (maximum size).

2.3.1 Edge region of an outer edge

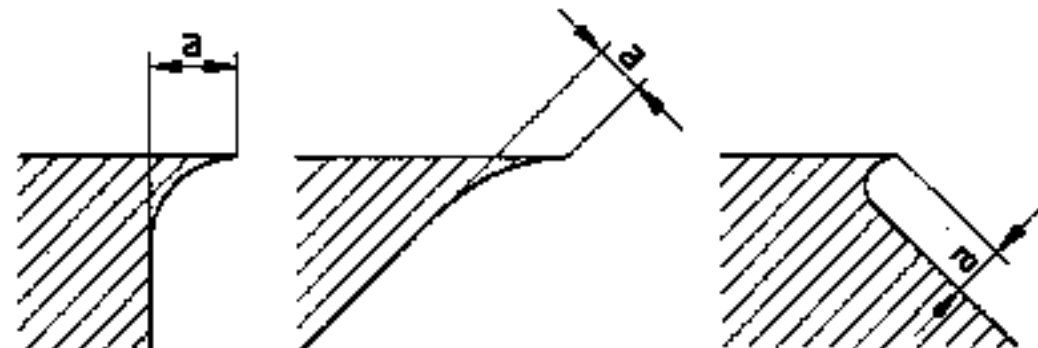


Figure 3.

Figure 4.

Figure 5.

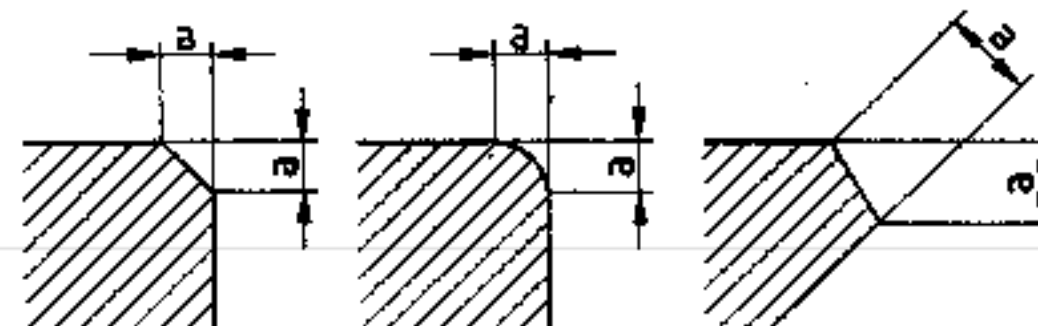


Figure 6.

Figure 7.

Figure 8.

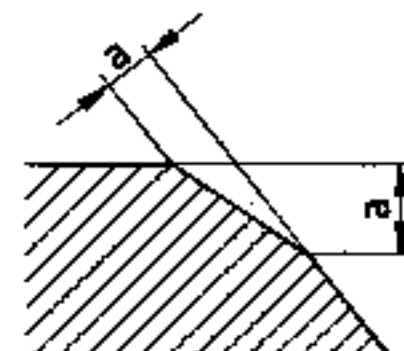


Figure 9.

Continued on pages 2 to 8

No guarantee can be given in respect of this translation. In all cases the latest German-language version of this Standard shall be taken as authoritative.

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Fachtechnisches Übersetzungsinstitut
Henry G. Freeman, Düsseldorf

Kein Umtausch
bei Änderungen

2.3.2 Edge region of an inner edge

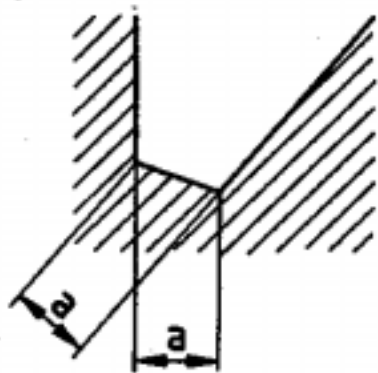


Figure 10.

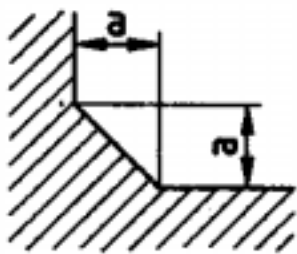


Figure 11.

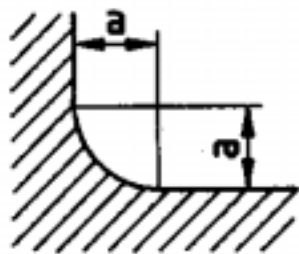


Figure 12.

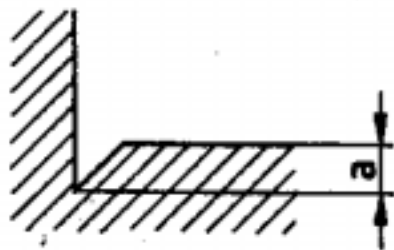


Figure 13.

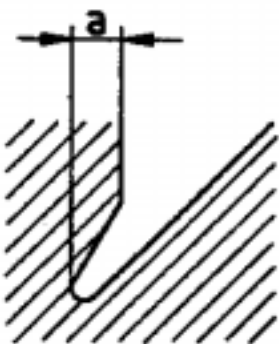


Figure 14.

3 Inscription in drawings

3.1 Reference to this standard

It is recommended that the following reference should be made to this standard in the title block or in the vicinity of the latter:

Workpiece edges according to DIN 6784

3.2 Basic symbol

The workpiece edge is characterized by the symbol according to figure 15 and the corresponding dimensions which must be entered in fields a_1 , a_2 or a_3 according to figure A.1. The length and direction of the reference arrowhead may be adapted to the requirements of the drawing (see figure 24).

For rules concerning the symbol design see appendix A.

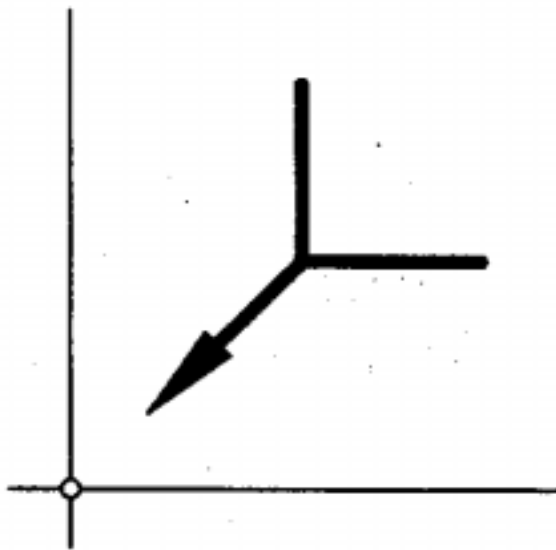


Figure 15.

3.3 Indicating the edge condition and edge dimension on the basic symbol

3.3.1 The edge dimension must be entered on the basic symbol (for example see figure 16) with the symbol element + or - for the edge condition according to table 1 (in field a_1 corresponding to the specification of figure A.1).

Table 1.

Symbol element	Meaning	
	Outer edge	Inner edge
+	with burr	transition
-	without burr	removal
±	with or without burr	transition or removal

The direction of burr or removal is then optional. The edge dimension entered counts as the maximum size.

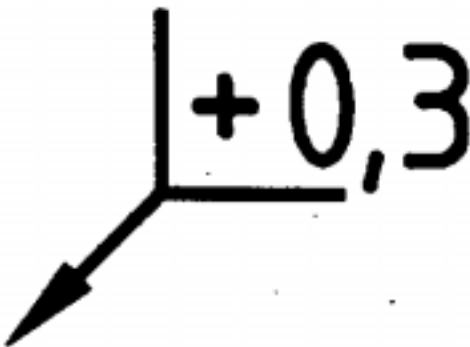


Figure 16.

3.3.2 The edge condition may also be indicated solely with the symbol element + or - without stating the edge dimension. The direction of burr or removal and the edge dimension are optional (see figures 17 and 18).



Figure 17.

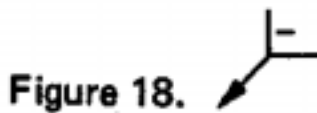


Figure 18.

3.3.3 Direction of burr or removal

If it is necessary to define the direction of burr of an outer edge or the direction of removal of an inner edge, this shall be done by entering the dimensions on a prolongation of one of the legs of the basic symbol (corresponding with fields a_2 or a_3 according to figure A.1) (see figures 19 and 20).



Figure 19.

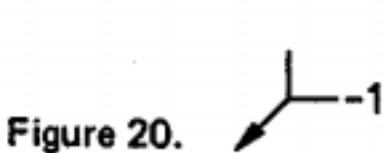


Figure 20.

3.4 Edge dimensions

3.4.1 Recommended edge dimensions "a" in mm, see table 2

Table 2.

1) + 2,5 + 1 + 0,5 + 0,3 + 0,1		for edges with burr or transition
+ 0,05 + 0,02	for sharp edges	
- 0,02 - 0,05		
- 0,1 - 0,3 - 0,5 - 1 - 2,5 1)		for edges without burr or removal
1) Further dimensions as required		

3.4.2 If it is necessary to specify an upper and a lower limit for the edge dimension, both values must be stated, the maximum size being placed above the minimum size (see figures 21 to 23). Dimensions for a specified burr direction (see subclause 3.3.3) are entered similarly.



Figure 21.

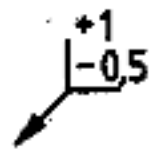


Figure 22.

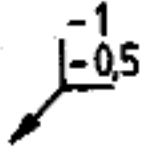


Figure 23.

3.5 Indications on drawings

3.5.1 The indication on a drawing can refer to the following edge lengths:

- to an edge perpendicular to the plane of projection (figure 24, view from the front)
- running around the periphery of a workpiece or a hole (see section in figure 24 and figure 25).

If only one view is shown, the entry generally also applies to all edges lying hidden behind the visible edge (see figures 25 and 26). Where stampings are concerned, however, a distinction must be made between the entering side and the burr side.

The direction in which the dimension figures are written always coincides with the direction in which the drawing is read *).

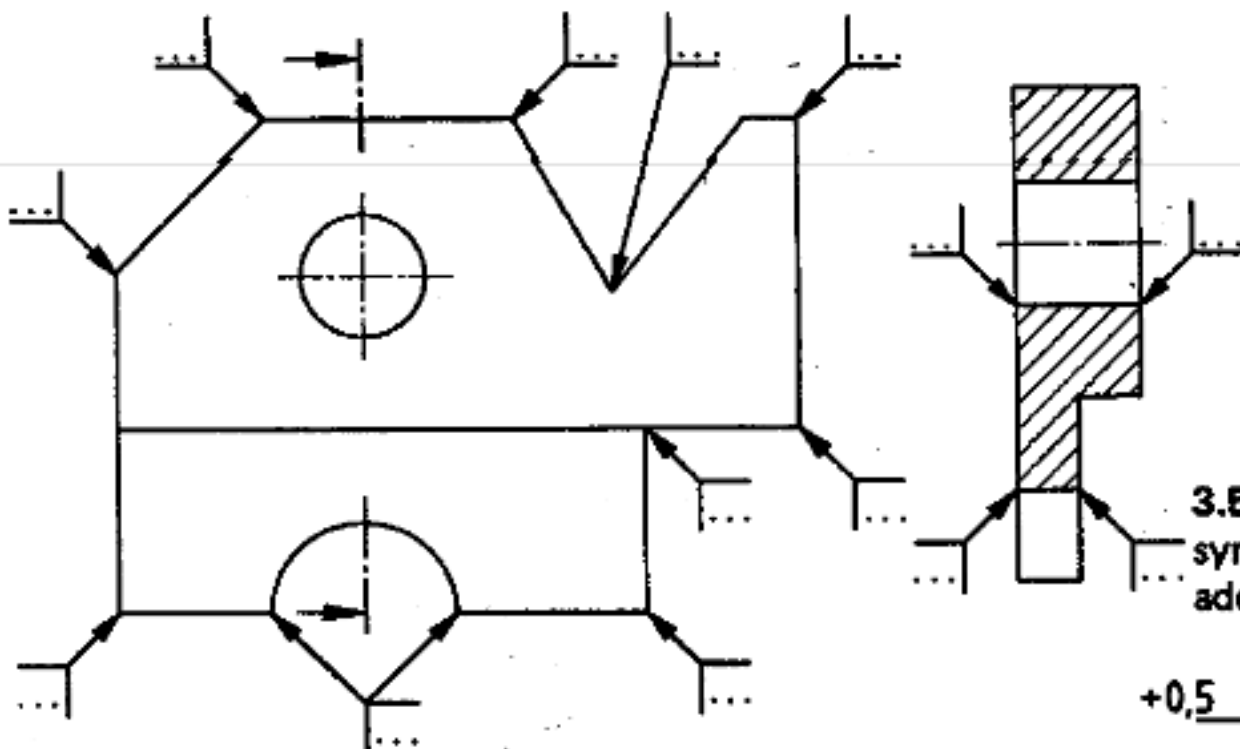


Figure 24.

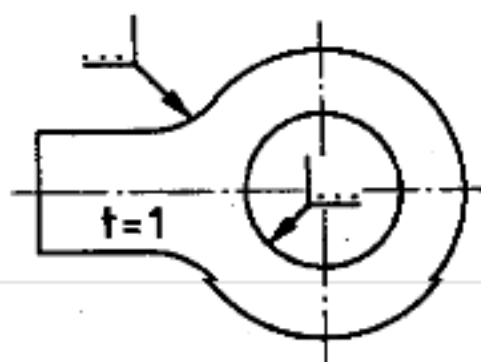


Figure 25.

3.5.2 Edge conditions which apply only to a specified length must be defined by appropriate dimensions and by a chain line (broad) (figure 26).

3.5.3 If the same edge condition information is to apply to all the edges of a workpiece, it is sufficient to enter the data once only in a suitable position on the drawing.

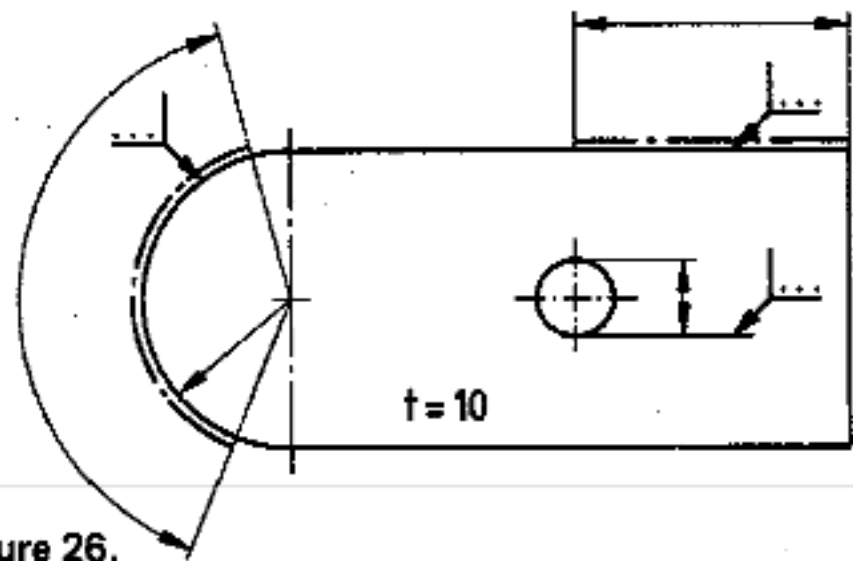


Figure 26.

3.5.4 Information which is to apply only to outer edges must be entered according to figure 27, and correspondingly for inner edges according to figure 28.

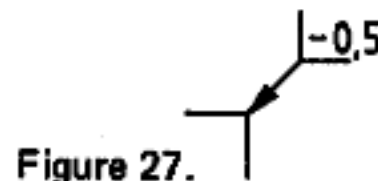


Figure 27.

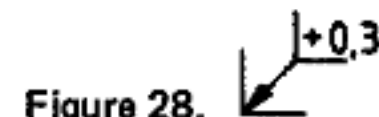


Figure 28.

3.5.5 If, in addition to a general item of information, further details regarding edge conditions are needed in the representation, these details shall be placed in brackets alongside the general information (see figure 29 and figure 30).

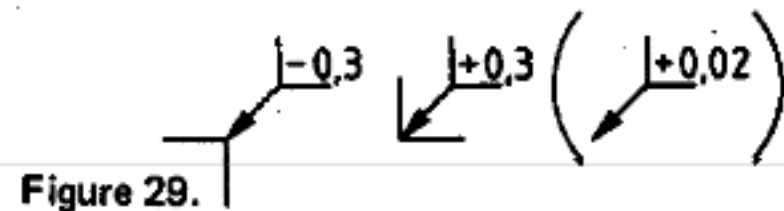


Figure 29.

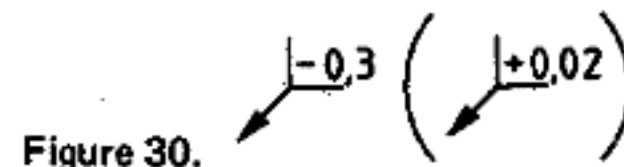


Figure 30.

3.5.6 On the lines of subclause 3.5.5, a bracketed basic symbol (see figure 31) may be entered instead of the additional information (simplified).

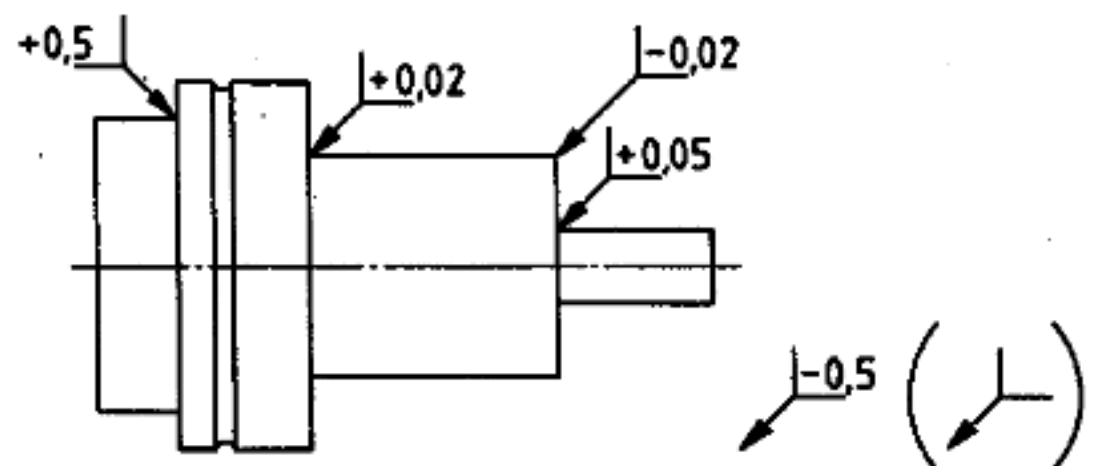


Figure 31.

*) See DIN 406 Part 2.

In figures 24 to 26 instead of dimensions only the possible position of an inscription is indicated by three dots.

4 Examples

Table 3.

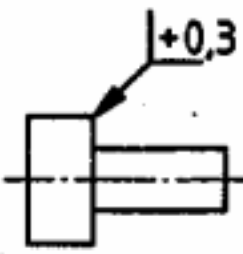
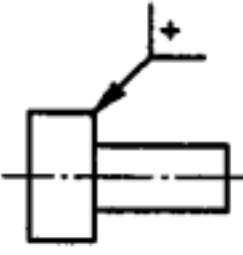
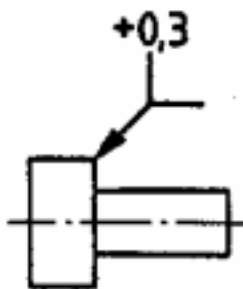
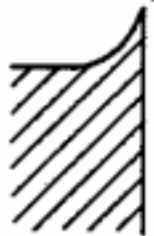
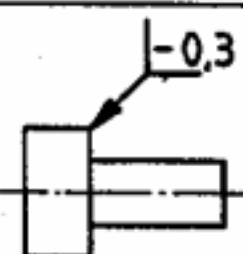
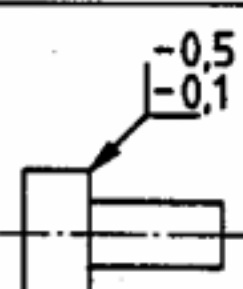
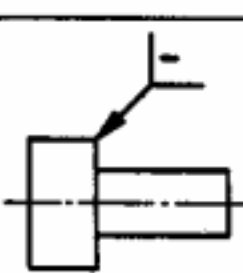
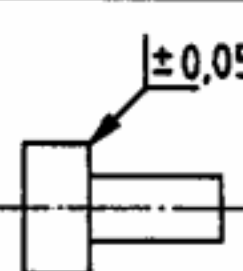
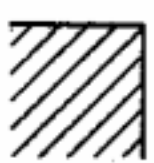
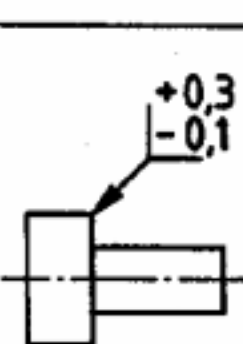
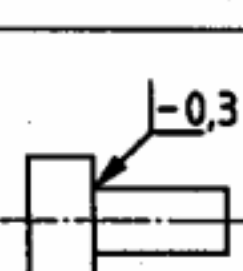
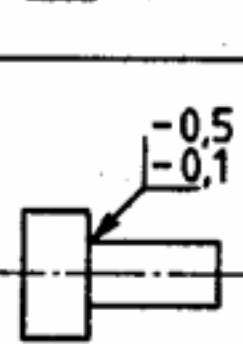
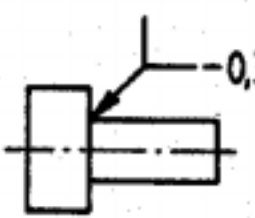
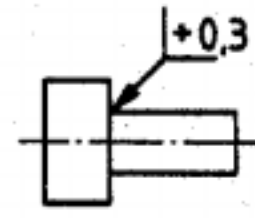
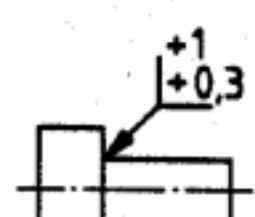
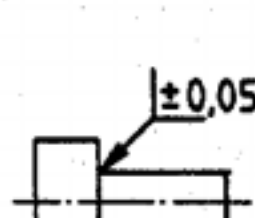
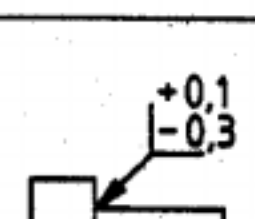
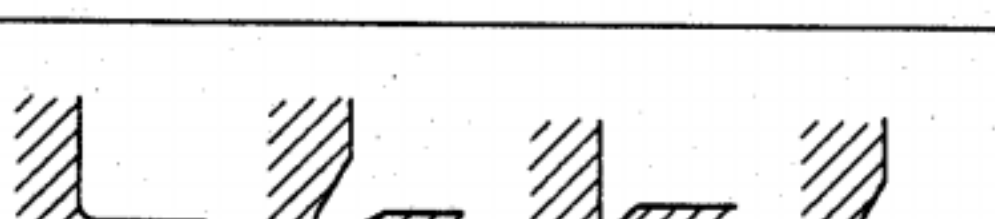
No.	Example	Meaning	Explanation
1			Outer edge with burr up to 0,3, direction of burr optional
2			Outer edge with burr, height and direction of burr optional
3			Outer edge with burr up to 0,3, direction of burr specified
4			Outer edge without burr up to 0,3, form of removal optional
5			Outer edge without burr in the region from 0,1 to 0,5, form of removal optional
6			Outer edge without burr, form of removal optional
7			Outer edge optionally with burr up to 0,05 or without burr up to 0,05 (sharp-edged), direction of burr optional
8			Outer edge optionally with burr up to 0,3 or without burr up to 0,1, direction of burr optional
9			Inner edge with removal up to 0,3, direction of removal optional
10			Inner edge with removal in the region from 0,1 to 0,5, direction of removal optional

Table 3. (continued)

No.	Example	Meaning	Explanation
11			Inner edge with removal up to 0,3, direction of removal specified
12			Inner edge with transition up to 0,3, form of transition optional
13			Inner edge with transition in the region from 0,3 to 1, form of transition optional
14			Inner edge optionally with removal up to 0,05 or transition up to 0,05 (sharp-edged), form of removal/transition optional
15			Inner edge optionally with transition up to 0,1 or removal up to 0,3, direction of removal optional

Appendix A

Symbol proportions and dimensions

To coordinate the size of the symbols laid down in this standard with other lettering in the drawing (dimensions, tolerance data), the following rules consistent with DIN 32 830 Part 2 must be observed:

A.1 General requirements

A.1.1 All symbols must be drawn in the same line width d' which, depending on the character size used for entering the dimension, is $\frac{1}{10} \cdot h$ (see table A.1).

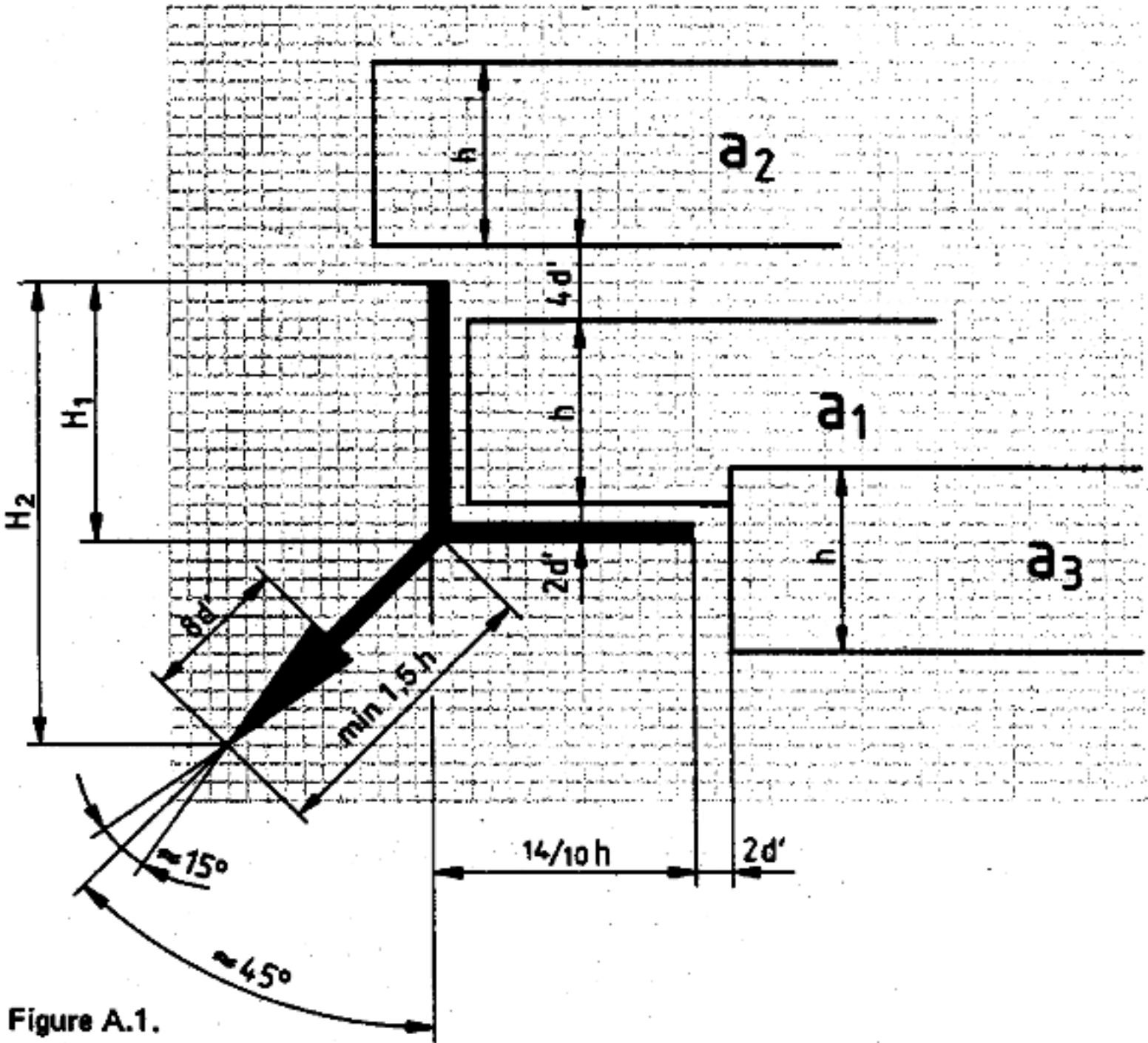
A.1.2 All characters must be drawn with the same line width d and the same height h of the style of character used for entering dimensions in the drawing concerned (preferably style B vertical according to DIN 6776 Part 1).

A.1.3 The minimum separation between adjacent lines shall be twice the width of the narrower line. It is recommended that this separation should be not less than 0,7 mm.

A.1.4 As a departure from the basic symbol laid down in figure A.1, the reference line with arrowhead according to DIN 406 Part 2 may be used (see figure 24).

A.2 Proportions

The symbol and the additional data in fields a_1 to a_3 must be drawn according to figure A.1.



A.3 Dimensions

The range of sizes to be used for the symbols and the additional data is defined as follows:

Table A.1						Dimensions in mm
Character size h (e.g. height of figures)	3,5	5	7	10	14	
Line width for symbols d'	0,35	0,5	0,7	1	1,4	
Line width for lettering	$\frac{1}{10} \cdot h$ (see subclause A.1.1)					
Symbol size H_1	5	7	10	14	20	
Height H_2 ¹⁾	8,75	12,5	17,5	25	35	
¹⁾ Height H_2 alters if, for example, data are entered with prolonged reference arrowhead (example in figure 24).						

A.4 Registration

The symbol is registered under registration No. 05587-2 according to DIN 30 600.

Standards referred to

- DIN 406 Part 2 Dimensioning in drawings; rules
DIN 6776 Part 1 Technical drawings; lettering, characters
DIN 32 830 Part 2 Rules for designing graphical symbols; graphical symbols for technical drawings

Further standards

- DIN 78 Thread ends; lengths of projection of thread ends for ISO metric threads according to DIN 13
DIN 250 Rounding radii
DIN 509 Undercuts
DIN 9830 Burr heights on stamped parts
DIN 32 830 Part 1 Rules for designing graphical symbols; general principles

Previous editions

DIN 6784 Part 1: 09.75

Amendments

Compared with the September 1975 edition of DIN 6784 Part 1, the following amendments have been made:

- a) the use of shape letter symbols and the coding of dimensions have been dispensed with;
b) the following have been added
- reference to the standard (subclause 3.1)
 - direction of burr or of removal (subclause 3.6)
 - examples No. 3 and No. 11 (table 3)
 - proportions and dimensions of symbols (appendix A).

Explanations

The edge data laid down in this standard supersede verbal information previously used, e.g. edges broken, deburred, without burr, sharp-edged, undercut, recessed. The edge condition is described independently of the shape. It is intended that it shall be imparted by the normal production process, mainly without extra effort, e.g. by non-deburring of burred edges, removal of burr, sharpening of cutting edges, formless undercutting or radiusing by the tip radius of cutting tools. A specified height of burr or direction of burr or removal can be achieved by suitable choice of the final stage of machining.

It is intended to submit this standard as a proposal for an ISO Standard.

Specifications of DIN 6784 Part 1, September 1975 edition

To enable users of this standard to interpret indications on drawings according to DIN 6784 Part 1, September 1975 edition, the superseded specifications are quoted below. When new technical documentation is being prepared these indications must no longer be used.

These interpretation aids will cease to be contained in a revised edition of this standard.

Finish and permissible dimensions

Form			Finish		Permissible dimensions				Explanation
					Outer edge		Inner edge		
A	1	smooth	medium coarse very coarse		projection		transition		With burr: projection or transition may be present.
	2	0,25			0,05				
	3	up to 0,5			up to 0,25				
	4	1,0			1,0				
B	1	smooth	medium coarse very coarse		0,25		2,5		Functional burr must be present.
	2	up to 0,5			up to 0,25				
	3	1,0			1,0				
	4	2,5			2,5				
C	1	smooth	medium coarse very coarse		projection				Sharp-edged: a small projection or a small transition or a small removal of material is permissible.
	2	from 0,01 to 0,05			—				
	3	0,025 to 0,1							
	4	0,05 to 0,5							
D	1	smooth	medium coarse very coarse		0,25 to 1,5				Without burr: no projection is permissible, but removal of material is mandatory.
	2								
	3								
	4								
E	1	smooth	medium coarse very coarse		projection	removal	transition	removal	Without burr: no projection is permissible, but removal of material is mandatory.
	2	0,01			0,01	0,025	0,025		
	3	up to 0,025			up to 0,025	up to 0,05	up to 0,05		
	4	0,05			0,05	0,1	0,1		
F	1	smooth	medium coarse very coarse		0,1	0,1	0,25	0,25	Without burr: no projection is permissible, but removal of material is mandatory.
	2	up to 0,25			up to 0,25	up to 0,5	up to 0,5		
	3	0,5			0,5	1,5	1,5		
	4	1,5			1,5	3,0	3,0		

Entering the data

Edge condition	Indication on drawing ¹⁾	Remarks
Outer edge, with burr up to 0,5; direction of burr optional		Edge of A2 form according to DIN 6784, without stipulation regarding direction of burr
Outer edge, with burr up to 0,5; direction of burr vertical		Edge of A2 form according to DIN 6784; direction of burr vertical referred to normal position of use of the drawing
Outer edge, with burr; without special stipulations regarding edge condition		Edge of A form according to DIN 6784; direction and height of burr as imparted by the preceding manufacturing process
Inner edge, removal up to 0,5, direction horizontal		Edge of D2 form according to DIN 6784; direction of recess horizontal referred to the plane of the drawing
1) For whatever finish is specified the form letter symbols and accuracy grades are to be taken from clause 3.		