

INTERNATIONAL STANDARD

ISO
8020

Second edition
1992-02-01

Tools for pressing — Punches with cylindrical head and reduced shank

Outillage de presse — Poinçons à tête cylindrique et à corps épaulé



Reference number
ISO 8020:1992(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

International Standard ISO 8020 was prepared by Technical Committee ISO/TC 29, *Small tools*, Sub-Committee SC 8, *Tools for pressing and moulding*.

This second edition cancels and replaces the first edition (ISO 8020:1986). The tolerances on the diameters and the point diameters have been technically revised.

Annex A of this International Standard is for information only.

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International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Tools for pressing — Punches with cylindrical head and reduced shank

1 Scope

This International Standard specifies the basic dimensions and tolerances, in millimetres, of cylindrical head punches with reduced shank.

Cylindrical head punches with reduced shank are standardized in round, oblong, square and rectangular shapes.

It gives examples of materials and their hardness, and specifies the designation of punches in accordance with this International Standard.

These punches are available with shank diameters, D_1 , from 5 mm to 32 mm.

The main use of the punches specified in this International Standard is for punching holes in steel sheet. They may also be used for punching holes in other materials.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8695:1987, *Tools for pressing — Punches — Nomenclature and terminology*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 8695 apply.

4 Dimensions

4.1 Perforating punches

4.1.1 Blanks — Type A

See figure 1 and table 1.

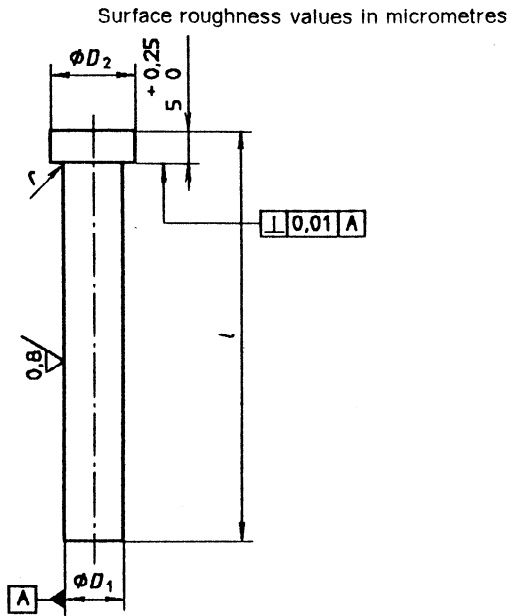


Figure 1

Table 1

Shank diameter D_1	Head diameter D_2	r	Overall length l					
			56	63	71	80	90	100
m5	$\begin{smallmatrix} 0 \\ -0,25 \end{smallmatrix}$	$\pm 0,1$	x	x	x	x	x	x
5	8	0,25	x	x	x	x	x	x
6	9		x	x	x	x	x	x
8	11		x	x	x	x	x	x
10	13	0,4	x	x	x	x	x	x
13	16		x	x	x	x	x	x
16	19		x	x	x	x	x	x
20	24	0,4	x	x	x	x	x	x
25	29		x	x	x	x	x	x
32	36		x	x	x	x	x	x

4.1.2 Perforating punches, round — Type B

See figure 2 and table 2.

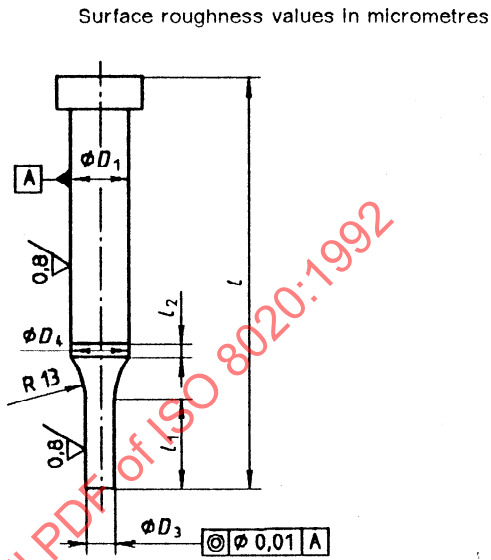


Figure 2

Table 2

Shank diameter D_1	Range of point diameter D_3	Overall length l					
		56	63	71	80	90	100
5	$1 \leq D_3 \leq 4,9$	x	x	x	x	x	x
6	$1,6 \leq D_3 \leq 5,9$	x	x	x	x	x	x
8	$2,5 \leq D_3 \leq 7,9$	x	x	x	x	x	x
10	$4 \leq D_3 \leq 9,9$	x	x	x	x	x	x
13	$5 \leq D_3 \leq 12,9$	x	x	x	x	x	x
16	$8 \leq D_3 \leq 15,9$	x	x	x	x	x	x
20	$12 \leq D_3 \leq 19,9$	x	x	x	x	x	x
25	$16,5 \leq D_3 \leq 24,9$	x	x	x	x	x	x
32	$20 \leq D_3 \leq 31,9$	x	x	x	x	x	x

NOTE — The point length l_1 , diameter D_4 and length l_2 are left to the manufacturer's discretion. See 4.1.1 for dimensions and tolerances of the head and tolerances of D_1 and l .

4.1.3 Perforating punches, square (S), rectangular (R) and oblong (O) — Type C

See figure 3 and table 3.

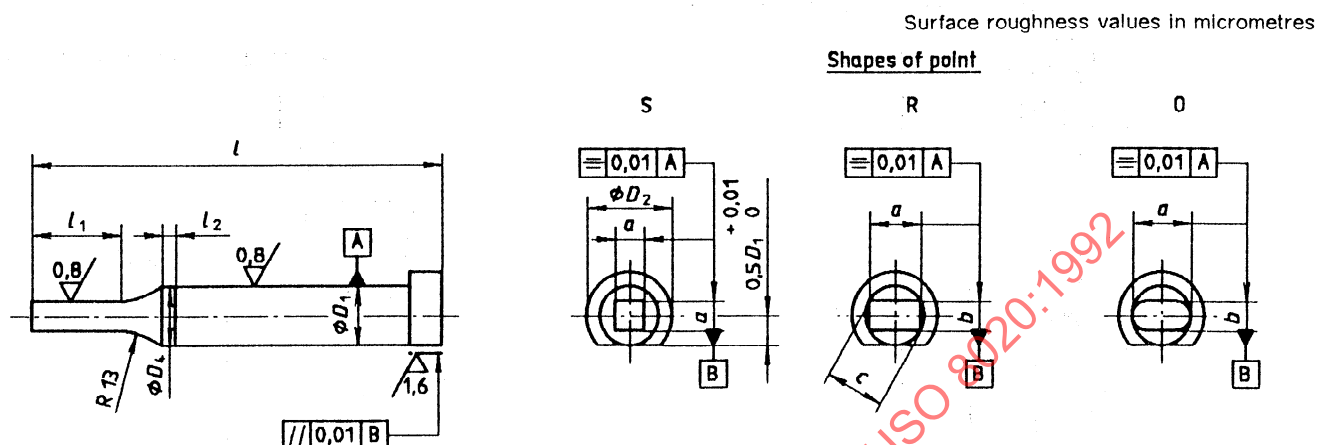


Figure 3

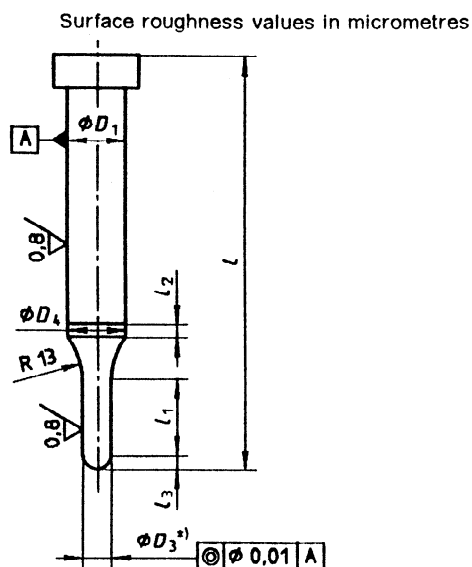
Table 3

Shank diameter D_1	Range of point dimensions for shape		Overall length l					
	S	R or O						
	a j6	b, a and c j6	56	63	71	80	90	100
5	$1 \leq a \leq 3,5$	$1 \leq b, a \text{ and } c \leq 4,9$	x	x	x	x	x	
6	$1,6 \leq a \leq 4,2$	$1,6 \leq b, a \text{ and } c \leq 5,9$	x	x	x	x	x	x
8	$2 \leq a \leq 5,6$	$2 \leq b, a \text{ and } c \leq 7,9$	x	x	x	x	x	x
10	$3,5 \leq a \leq 7$	$3,5 \leq b, a \text{ and } c \leq 9,9$	x	x	x	x	x	x
13	$4,5 \leq a \leq 9,1$	$4,5 \leq b, a \text{ and } c \leq 12,9$	x	x	x	x	x	x
16	$6 \leq a \leq 11,3$	$6 \leq b, a \text{ and } c \leq 15,9$	x	x	x	x	x	x
20	$8 \leq a \leq 14,1$	$8 \leq b, a \text{ and } c \leq 19,9$	x	x	x	x	x	x
25	$10 \leq a \leq 17,6$	$10 \leq b, a \text{ and } c \leq 24,9$	x	x	x	x	x	x
32	$10 \leq a \leq 22,6$	$10 \leq b, a \text{ and } c \leq 31,9$	x	x	x	x	x	x

NOTE — The point length l_1 , diameter D_1 and length l_2 are left to the manufacturer's discretion. See 4.1.1 for dimensions and tolerances of the head and tolerances of D_1 and l .

4.2 Pilot punches — Type D

See figure 4 and table 4.



*) The diameter D_3 of the pilot shall be smaller than the diameter of the equivalent punch.

Figure 4

4.3 Perforating punches with ejector

4.3.1 Blanks — Type E

See figure 5 and table 5.

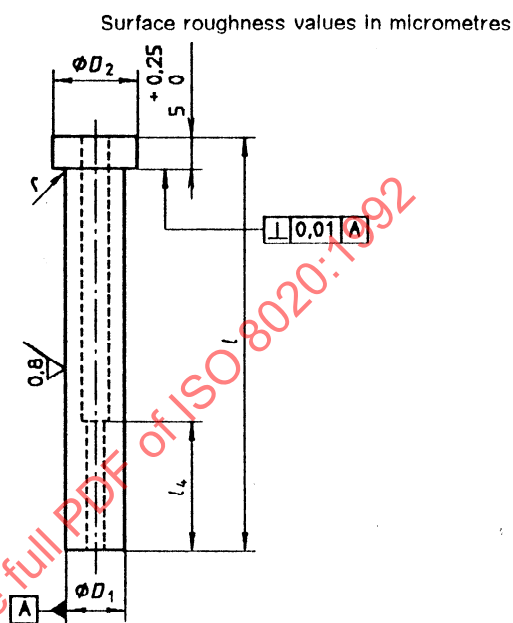


Figure 5

Table 4

Shank diameter D_1	Range of point diameter D_3	Overall length l					
		56	63	71	80	90	100
	J6						
5	$0,99 \leq D_3 \leq 4,9$	x	x	x	x	x	x
6	$1,9 \leq D_3 \leq 5,9$	x	x	x	x	x	x
8	$2,4 \leq D_3 \leq 7,9$	x	x	x	x	x	x
10	$3,9 \leq D_3 \leq 9,9$	x	x	x	x	x	x
13	$4,9 \leq D_3 \leq 12,9$	x	x	x	x	x	x
16	$7,9 \leq D_3 \leq 15,9$	x	x	x	x	x	x
20	$11,9 \leq D_3 \leq 19,9$	x	x	x	x	x	x
25	$15 \leq D_3 \leq 24,9$	x	x	x	x	x	x
32	$19,9 \leq D_3 \leq 31,9$	x	x	x	x	x	x

NOTE — The point lengths l_1 and l_3 , the point shape, diameter D_4 and length l_2 are left to the manufacturer's discretion. See 4.1.1 for dimensions and tolerances of the head and tolerances of D_1 and l .

Table 5

Shank diameter D_1	Head diameter D_2	r	Overall length l					
			$+1$ 0					
m5	0 $-0,25$	$\pm 0,1$	56	63	71	80	90	100
5	8	0,25	x	x	x	x	x	x
6	9		x	x	x	x	x	x
8	11		x	x	x	x	x	x
10	13	0,4	x	x	x	x	x	x
13	16		x	x	x	x	x	x
16	19		x	x	x	x	x	x
20	24	0,4	x	x	x	x	x	x
25	29		x	x	x	x	x	x
32	36		x	x	x	x	x	x

NOTE — The length l_4 and the ejector components are left to the manufacturer's discretion.

4.3.2 Perforating punches with ejector, round — Type F

See figure 6 and table 6.

Surface roughness values in micrometres

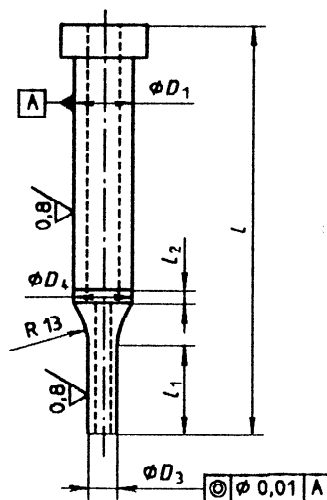


Figure 6

Table 6

Shank diameter D_1	Range of point diameter D_3 j6	Overall length l					
		56	63	71	80	90	100
5	$1,6 \leq D_3 \leq 4,9$	x	x	x	x	x	
6	$2,5 \leq D_3 \leq 5,9$	x	x	x	x	x	x
8	$3 \leq D_3 \leq 7,9$	x	x	x	x	x	x
10	$4 \leq D_3 \leq 9,9$	x	x	x	x	x	x
13	$5 \leq D_3 \leq 12,9$	x	x	x	x	x	x
16	$8 \leq D_3 \leq 15,9$	x	x	x	x	x	x
20	$12 \leq D_3 \leq 19,9$	x	x	x	x	x	x
25	$16,5 \leq D_3 \leq 24,9$	x	x	x	x	x	x
32	$20 \leq D_3 \leq 31,9$	x	x	x	x	x	x

NOTE — The point length l_1 , diameter D_4 , length l_2 and the ejector components are left to the manufacturer's discretion. See 4.3.1 for dimensions and tolerances of the head and tolerances of D_1 and l .

4.3.3 Perforating punches with ejector, square (S), rectangular (R) and oblong (O) — Type G

See figure 7 and table 7.

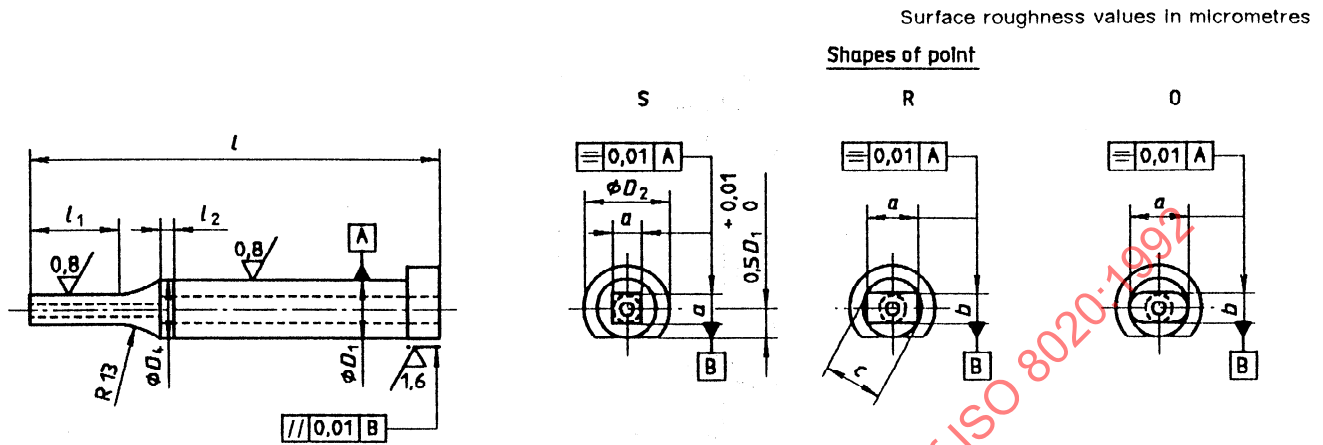


Figure 7

Table 7

Shank diameter D_1	Range of point dimensions for shape		Overall length					
	S	R or O	l					
	a j6	$b, a \text{ and } c$ j6	56	63	71	80	90	100
5 6 8	$1 \leq a \leq 3,5$ $1,6 \leq a \leq 4,2$ $2 \leq a \leq 5,6$	$1 \leq b, a \text{ and } c \leq 4,9$ $1,6 \leq b, a \text{ and } c \leq 5,9$ $2 \leq b, a \text{ and } c \leq 7,9$	x x x	x x x	x x x	x x x	x x x	 x x
10 13 16	$3,5 \leq a \leq 7$ $4,5 \leq a \leq 9,1$ $6 \leq a \leq 11,3$	$3,5 \leq b, a \text{ and } c \leq 9,9$ $4,5 \leq b, a \text{ and } c \leq 12,9$ $6 \leq b, a \text{ and } c \leq 15,9$	x x x	x x x	x x x	x x x	x x x	x x x
20 25 32	$8 \leq a \leq 14,1$ $10 \leq a \leq 17,6$ $10 \leq a \leq 22,6$	$8 \leq b, a \text{ and } c \leq 19,9$ $10 \leq b, a \text{ and } c \leq 24,9$ $10 \leq b, a \text{ and } c \leq 31,9$	x x x	x x x	x x x	x x x	x x x	x x x
NOTE — The point length l_1 , diameter D_2 , length l_2 and the ejector components are left to the manufacturer's discretion. See 4.3.1 for dimensions and tolerances of the head and tolerances of D_1 and l .								

5 Material and hardness

The material is left to the manufacturer's discretion. The following hardness values are given as examples:

a) tool steel with 5 % to 12 % Cr

— point: (62 ± 2) HRC

— head: (45 ± 5) HRC

b) high-speed steel

— point: (64 ± 2) HRC

— head: (52 ± 5) HRC

Various shapes of the point are shown in 4.1.2 to 4.3.3.

6 Designation

A punch in accordance with this International Standard shall be designated by

- a) "Punch";
- b) reference to this International Standard;
- c) the type of punch (A, B, C, D, E, F or G), and its shape (S, R or O) if necessary;
- d) its shank diameter, D_1 , in millimetres;
- e) for types B, C, D, F and G, the point dimensions (D_3 , a , or $a \times b$), in millimetres;

- f) its overall length, l , in millimetres.

EXAMPLES

A round perforating punch (type B) of shank diameter $D_1 = 5$ mm, of point diameter $D_3 = 2$ mm and of overall length $l = 56$ mm is designated as follows:

Punch ISO 8020-B-5 $\times$ 2 $\times$ 56

A rectangular perforating punch (type CR) of shank diameter $D_1 = 5$ mm, of point dimensions $a \times b = 2$ mm $\times$ 3 mm and of overall length $l = 56$ mm is designated as follows:

Punch ISO 8020-CR-5 $\times$ 2 $\times$ 3 $\times$ 56

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