

# INTERNATIONAL STANDARD

**ISO**  
**10071**

First edition  
1991-02-15

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## Tools for pressing — Ball-lock punches

*Outillage de presse — Poinçons à bille*  
**iTeh STANDARD PREVIEW**  
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ISO 10071:1991

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Reference number  
ISO 10071:1991(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 10071 was prepared by Technical Committee ISO/TC 29, *Small tools*.

Annex A of this International Standard is for information only.

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# Tools for pressing — Ball-lock punches

## 1 Scope

This International Standard lays down interchangeability dimensions and tolerances, in millimetres, for ball-lock punches.

Ball-lock punches are standardized in round, square, rectangular and oblong shapes, and dimension ranges are given for these shapes.

They are available in 6 mm to 25 mm shank diameter sizes.

This International Standard gives materials and hardness as examples, and specifies the designation of ball-lock punches.

The main use of punches defined 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*.

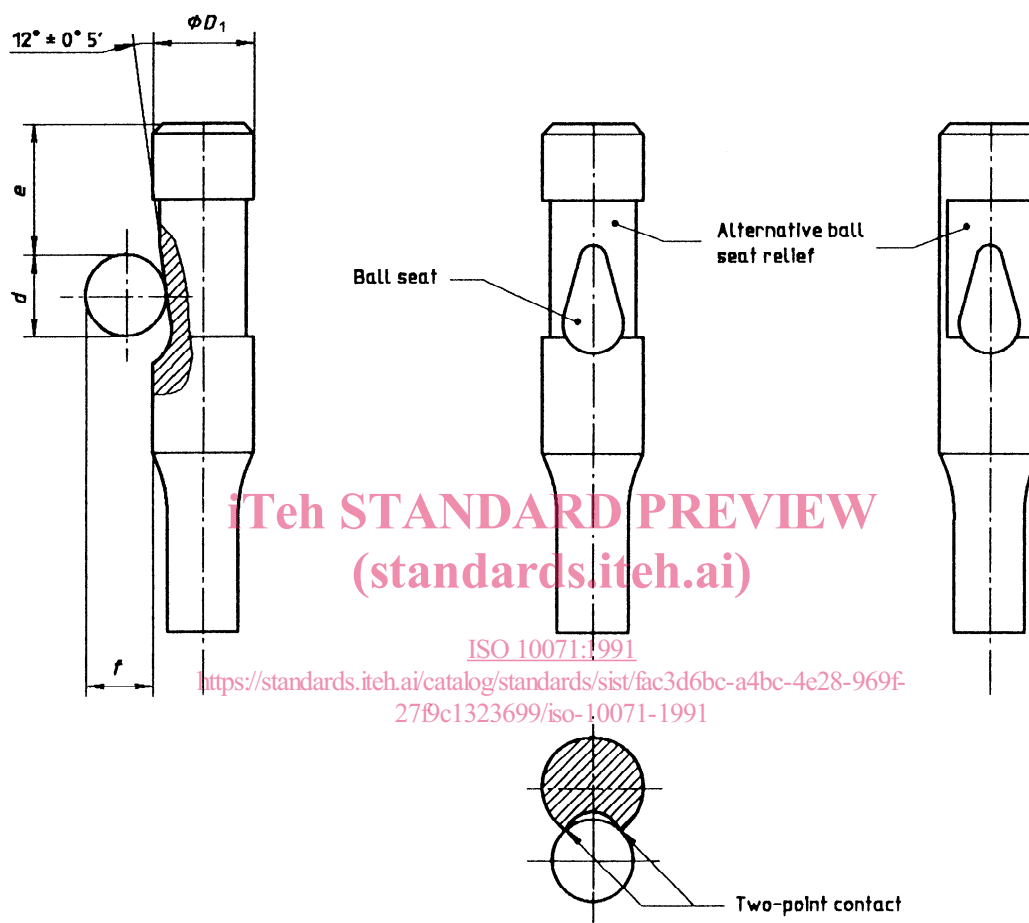
## 3 Definitions

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

## 4 Dimensions

### 4.1 Basic dimensions — Ball in working position

See figure 1 and table 1.



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Figure 1

Table 1

$D_1$	$d$	$e$	$f$
g5		$\begin{matrix} +0,2 \\ 0 \end{matrix}$	$\begin{matrix} 0 \\ -0,1 \end{matrix}$
6	6	14	5,2
10	8	12,4	6,7
13	8	12,4	6,7
16	8	12,4	6,7
20	8	12,4	6,7
25	8	12,4	6,7

4.2 Blanks — Type A

See figure 2 and table 2.

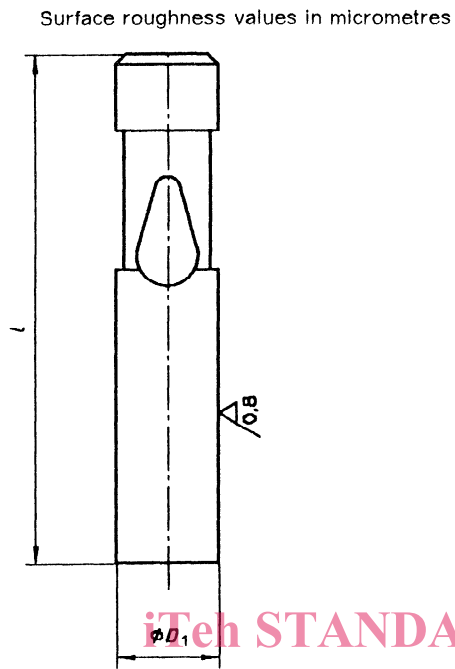


Table 2

$D_1$ g5	$l$ $+0,5$ $0$				
	50	56	63	71	80
6	x	x	x	x	x
10	x	x	x	x	x
13	x	x	x	x	x
16		x	x	x	x
20		x	x	x	x
25		x	x	x	x

NOTE — See 4.1 for the dimension of the ball and dimensions and tolerances of the ball seat.

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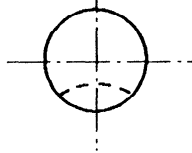


Figure 2

4.3 Round — Type B

See figure 3 and table 3.

Surface roughness values in micrometres

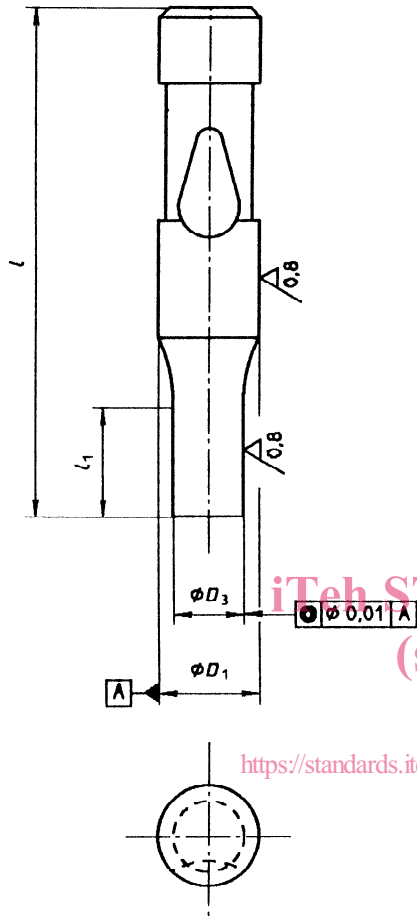


Table 3

$D_1$ g5	Range of point diameter $D_3$ j6	$l$ $+0,5$ $0$				
		50	56	63	71	80
6	$1,6 \leq D_3 \leq 5,9$	x	x	x	x	x
10	$3,5 \leq D_3 \leq 9,9$	x	x	x	x	x
13	$6 \leq D_3 \leq 12,9$	x	x	x	x	x
16	$8,5 \leq D_3 \leq 15,9$		x	x	x	x
20	$12,5 \leq D_3 \leq 19,9$		x	x	x	x
25	$18 \leq D_3 \leq 24,9$		x	x	x	x

NOTE — The point length  $l_1$  is left to the manufacturer's discretion. See 4.1 for the dimension of the ball and dimensions and tolerances of the ball seat.

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Figure 3

4.4 Punches, square (S), rectangular (R) and oblong (O) shapes — Type C

See figure 4 and table 4.

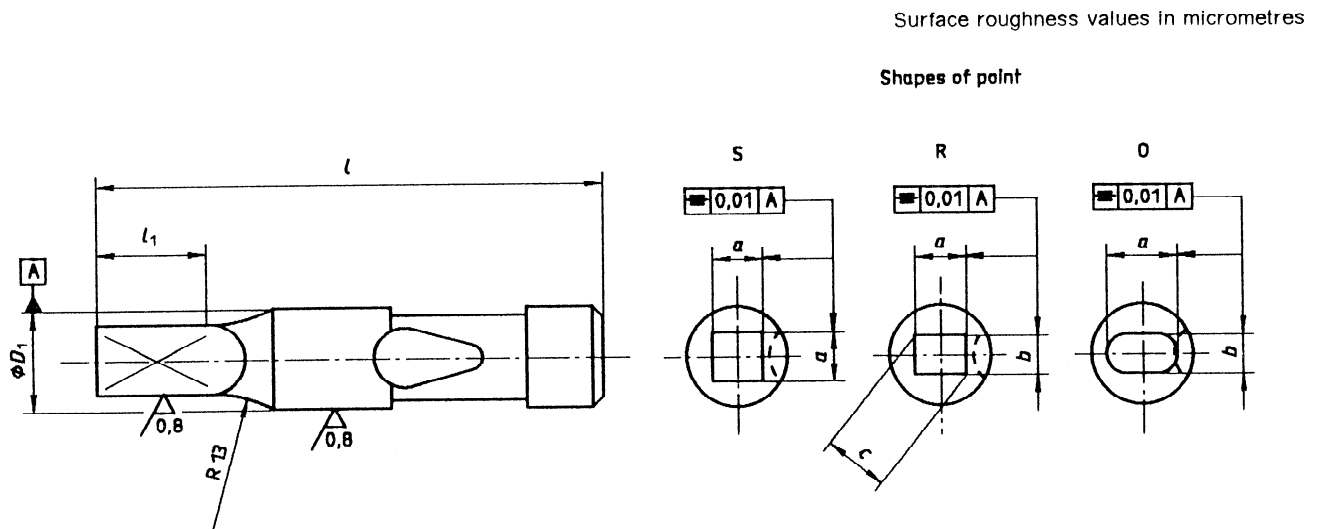


Figure 4

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Table 4

$D_1$	Range of point size		$l$				
	S	R or O	$+0,5$ $0$				
g5	$a$	$b, a$ and $c$					
	j6	j6	50	56	63	71	80
6	$1,6 \leq a \leq 4,2$	$1,6 \leq b, a \text{ and } c \leq 5,9$	x	x	x	x	x
10	$3,2 \leq a \leq 7$	$3,2 \leq b, a \text{ and } c \leq 9,9$	x	x	x	x	x
13	$5 \leq a \leq 9,1$	$5 \leq b, a \text{ and } c \leq 12,9$	x	x	x	x	x
16	$6,5 \leq a \leq 11,2$	$6,3 \leq b, a \text{ and } c \leq 15,9$		x	x	x	x
20	$8,5 \leq a \leq 14,1$	$8 \leq b, a \text{ and } c \leq 19,9$		x	x	x	x
25	$11 \leq a \leq 17,6$	$10 \leq b, a \text{ and } c \leq 24,9$		x	x	x	x

NOTE — The point length  $l_1$  is left to the manufacturer's discretion. See 4.1 for the dimension of the ball and dimensions and tolerances of the ball seat.

4.5 Pilot punch — Type D

See figure 5 and table 5.

Surface roughness values in micrometres

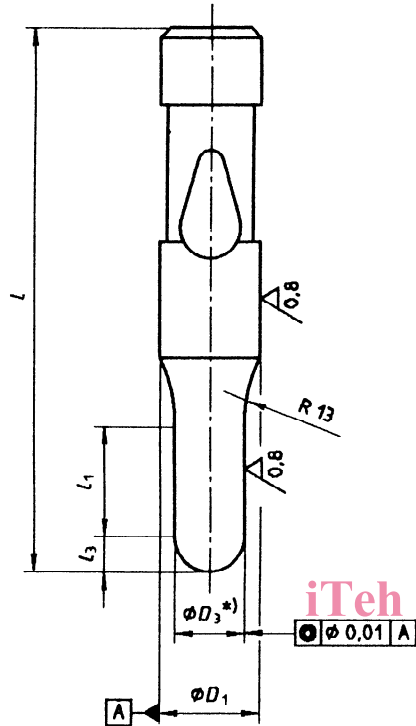


Table 5

$D_1$ g5	Range of point diameter $D_3$ j6	$l$ +0,5 0				
		50	56	63	71	80
6	$1,59 \leq D_3 \leq 5,9$	x	x	x	x	x
10	$3,49 \leq D_3 \leq 9,9$	x	x	x	x	x
13	$5,99 \leq D_3 \leq 12,9$	x	x	x	x	x
16	$8,49 \leq D_3 \leq 15,9$		x	x	x	x
20	$12,49 \leq D_3 \leq 19,9$		x	x	x	x
25	$17,99 \leq D_3 \leq 24,9$		x	x	x	x

NOTE — The point lengths  $l_1$  and  $l_3$  and point shape are left to the manufacturer's discretion. See 4.1 for the dimension of the ball and dimensions and tolerances of the ball seat.

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

Figure 5



4.6 Ejector punch, blanks — Type E

See figure 6 and table 6.

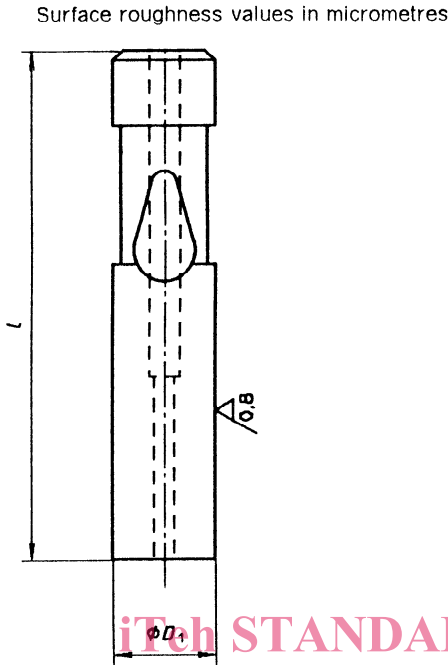


Table 6

$D_1$ g5	$l$ $+0,5$ $0$				
	50	56	63	71	80
6	x	x	x	x	x
10	x	x	x	x	x
13	x	x	x	x	x
16		x	x	x	x
20		x	x	x	x
25		x	x	x	x

NOTE — See 4.1 for the dimension of the ball and dimensions and tolerances of the ball seat.

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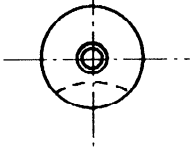


Figure 6