
Press tools for tablets — Punches and dies

Outillage de presse pour comprimés — Poinçons et matrices



Reference number
ISO 18084:2011(E)

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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.

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The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 18084 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

This second edition cancels and replaces the first edition (ISO 18084:2005), of which it constitutes a minor revision. In particular, key item 5 and key item 34 of Figure 1 and detail X of Figure 7 have been corrected.

Press tools for tablets — Punches and dies

1 Scope

This International Standard specifies the main dimensions, tolerances and characteristics of punches and dies for all kinds of tablets.

This International Standard deals with measures which are relevant for the interchangeability of the press punches between the different tableting machines of various manufacturers.

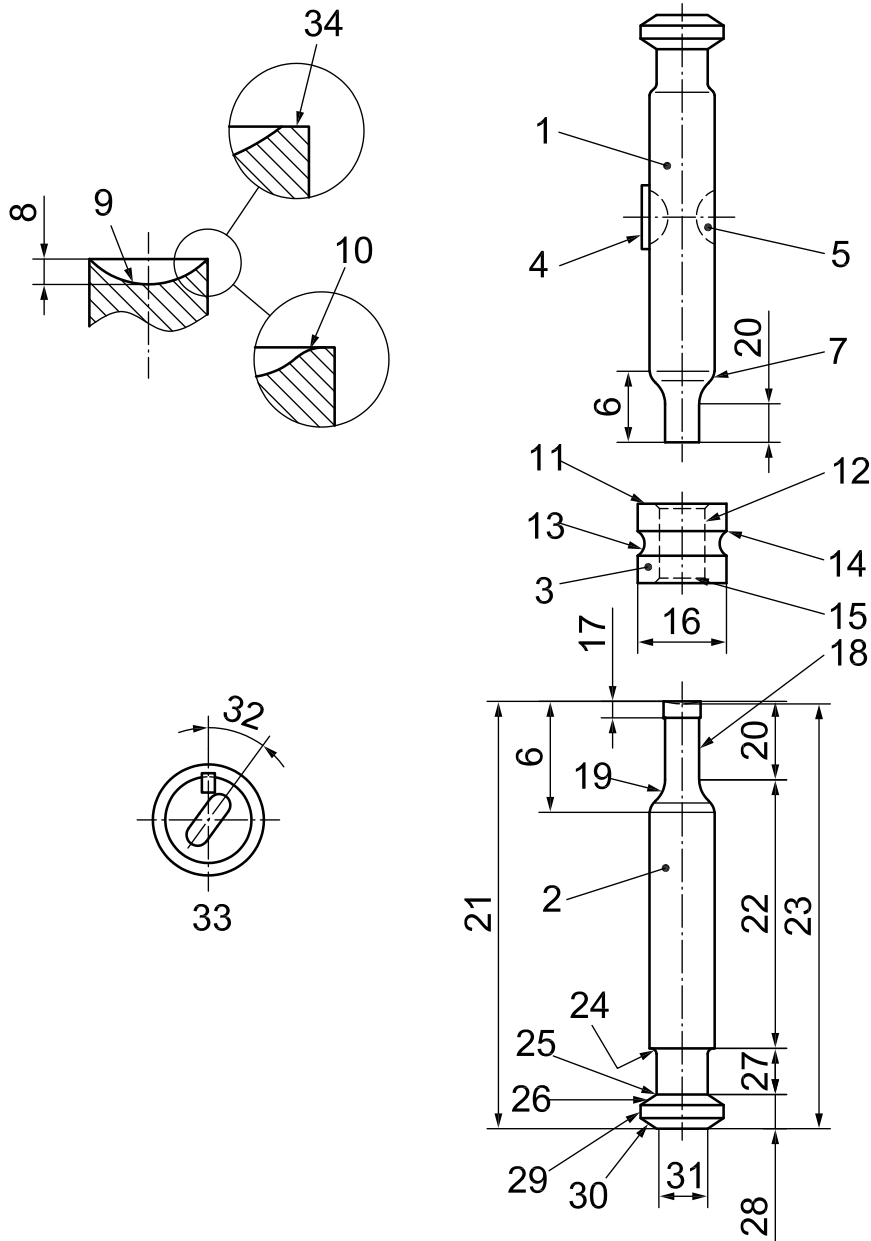
2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

3 Nomenclature

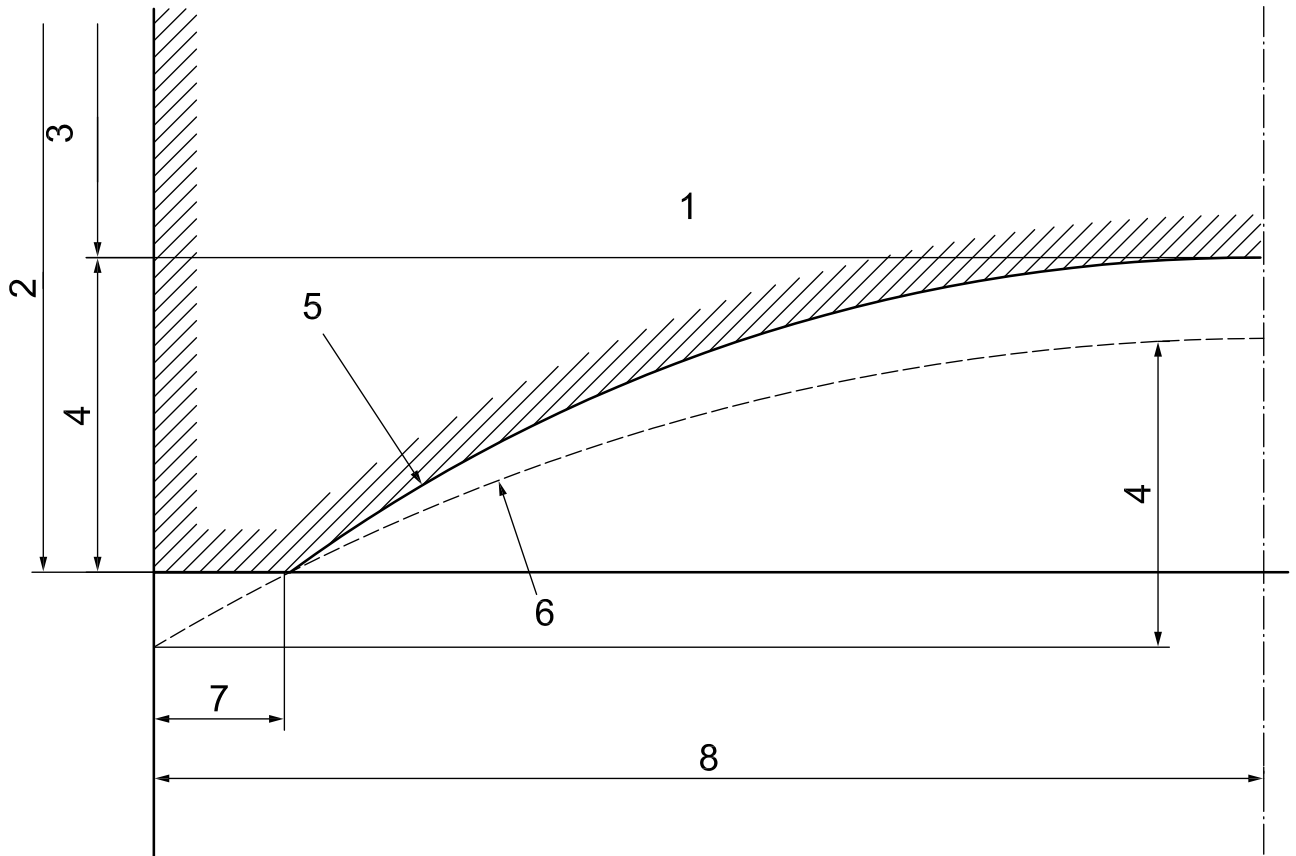
See Figures 1 and 2.



Key

- | | | |
|-----------------------------|----------------------------------|----------------------------------|
| 1 upper punch | 13 die groove | 25 neck-to-head radius |
| 2 lower punch | 14 protection radius or shoulder | 26 inside head angle |
| 3 die | 15 chamfer or radius | 27 neck under head |
| 4 key | 16 outer diameter | 28 head |
| 5 keyway | 17 tip straight | 29 head outer diameter |
| 6 stem (tip to full barrel) | 18 relief | 30 outside head angle |
| 7 barrel-to-stem chamfer | 19 barrel-to-stem radius | 31 head flat |
| 8 cup depth | 20 working length of the tip | 32 key orientation angle |
| 9 tip face | 21 overall length | 33 upper punch face key position |
| 10 blended land | 22 barrel | 34 land |
| 11 face | 23 working length | |
| 12 bore | 24 barrel-to-neck radius | |

Figure 1 — Punch and die terminology

**Key**

1	punch	4	depth cup	7	land
2	overall length	5	practical radius	8	tip face diameter
3	working length	6	nominal radius		

Figure 2 — Terminology related to tip face profile

4 Dimensions and tolerances

4.1 Punches

4.1.1 Upper punches

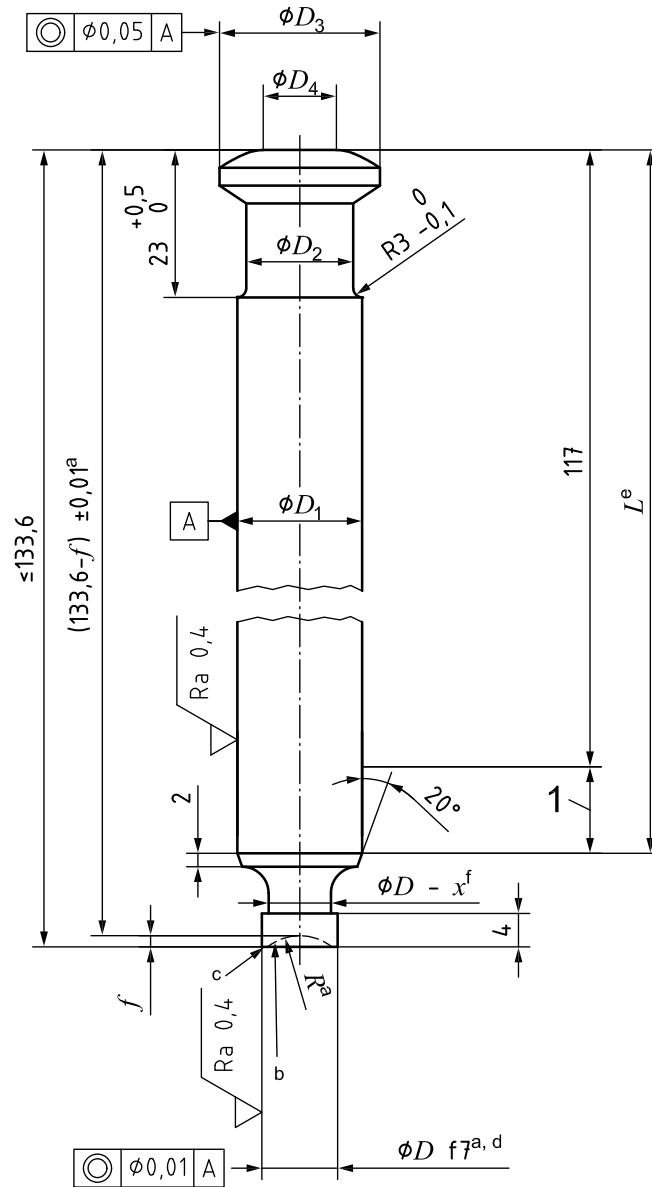
4.1.1.1 Upper punches without key

The dimensions and tolerance of upper punches without key shall be in accordance with the indications of Figure 3 and Table 1. The dimensions and tolerance of punch head shall be in accordance with the indications of Annex A.

4.1.1.2 Upper punches with key

The dimensions and tolerance of upper punches with key shall be in accordance with the indications of Figure 4 and Table 1. The dimensions and tolerance of punch head shall be in accordance with the indications of Annex A.

Dimensions in millimetres,
Surface roughness values in micrometres
General tolerance: ISO 2768-m



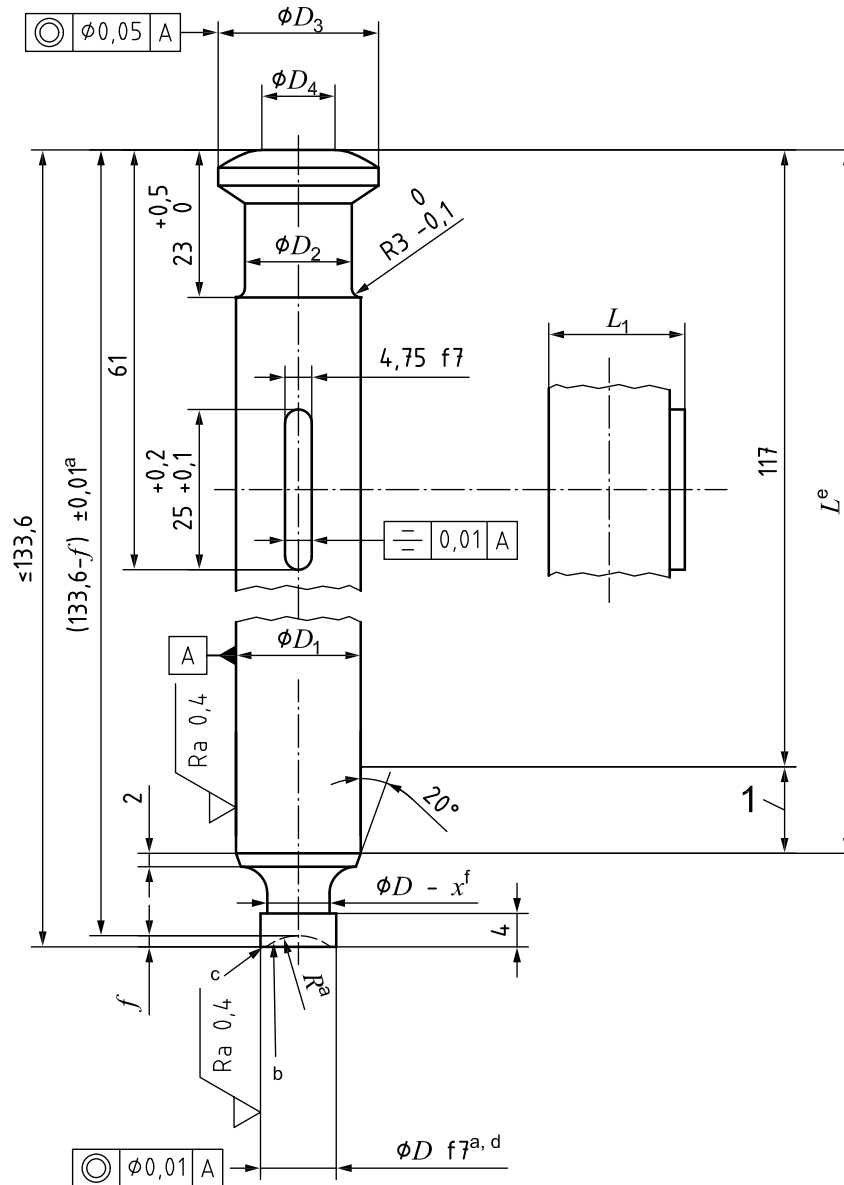
Key

1 dust cup place

- a The values of D , R and $(133,6 - f) \pm 0,01$ shall be defined by the user.
- b The appearance of the cup radius and the land shall correspond to a polished mirror (i.e. $0,025\ \mu\text{m} \leq Ra \leq 0,10\ \mu\text{m}$).
- c The land (see Figure 2, key item 7) varies according to D and the tablet dimensions, and should be equal to:
 - 0,05 for $D < 5$
 - 0,1 for $5 \leq D < 20$
 - 0,2 for $D \geq 20$.
- d For shape tooling, the tolerance of all dimensions of the tip should correspond to f7 applied to the largest dimension.
- e The values of L shall be subject to agreement between the manufacturer and the user.
- f x shall be subject to agreement between the manufacturer and the user.

Figure 3 — Upper punches without key

Dimensions in millimetres,
Surface roughness values in micrometres
General tolerance: ISO 2768-m



Key

1 dust cup place

a The values of D , R and $(133,6 - f) \pm 0,01$ shall be defined by the user.

b The appearance of the cup radius and the land shall correspond to a polished mirror (i.e. $0,025 \mu\text{m} \leq Ra \leq 0,10 \mu\text{m}$).

c The land (see Figure 2, key item 7) varies according to D and the tablet dimensions, and shall be equal to:

- 0,05 for $D < 5$
- 0,1 for $5 \leq D < 20$
- 0,2 for $D \geq 20$.

d For shape tooling, the tolerance of all dimensions of the tip should correspond to f7 applied to the largest dimension.

e The values of L shall be subject to agreement between the manufacturer and the user.

f x shall be subject to agreement between the manufacturer and the user.

Figure 4 — Upper punches with key

Table 1 — Dimensions of upper punches

Dimensions in millimetres

D_1	D_2	D_3	D_4	L_1
h6	0 -0,1	0 -0,1	$\pm 0,2$	0 -0,2
19	15,8	25,27	9,6	20,7
25,35	22	31,6	16	27

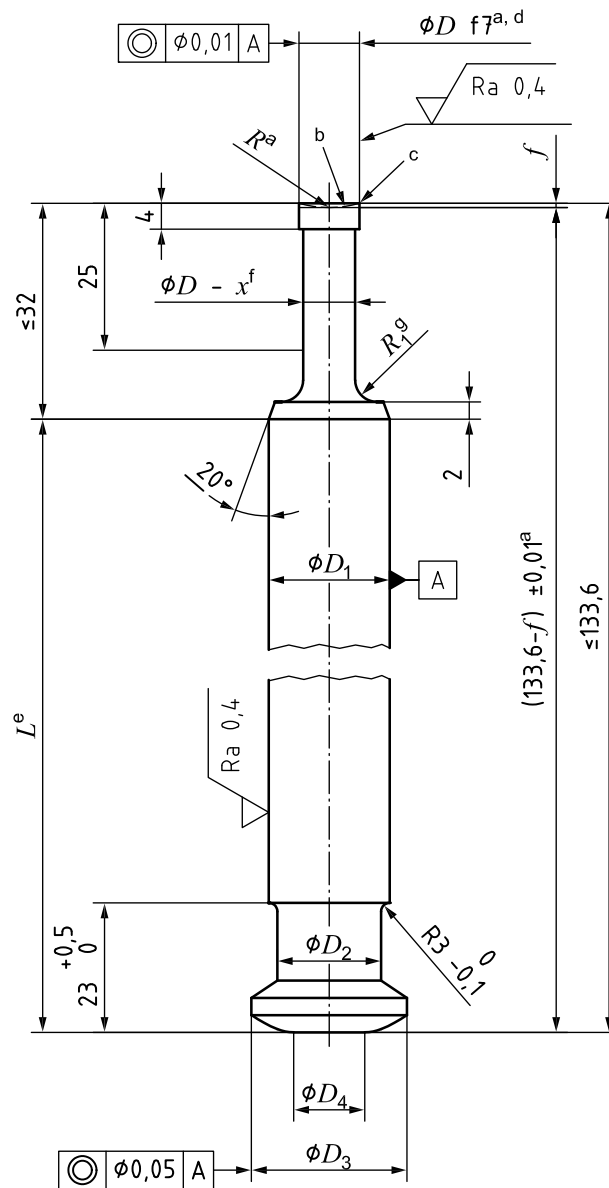
4.1.2 Lower punches**4.1.2.1 Lower punches without key**

The dimensions and tolerance of lower punches without key shall be in accordance with the indications of Figure 5 and Table 2. The dimensions and tolerance of punch head shall be in accordance with the indications of Annex A.

4.1.2.2 Lower punches with key

The dimensions and tolerance of lower punches with key shall be in accordance with the indications of Figure 6 and Table 2. The dimensions and tolerance of punch head shall be in accordance with the indications of Annex A.

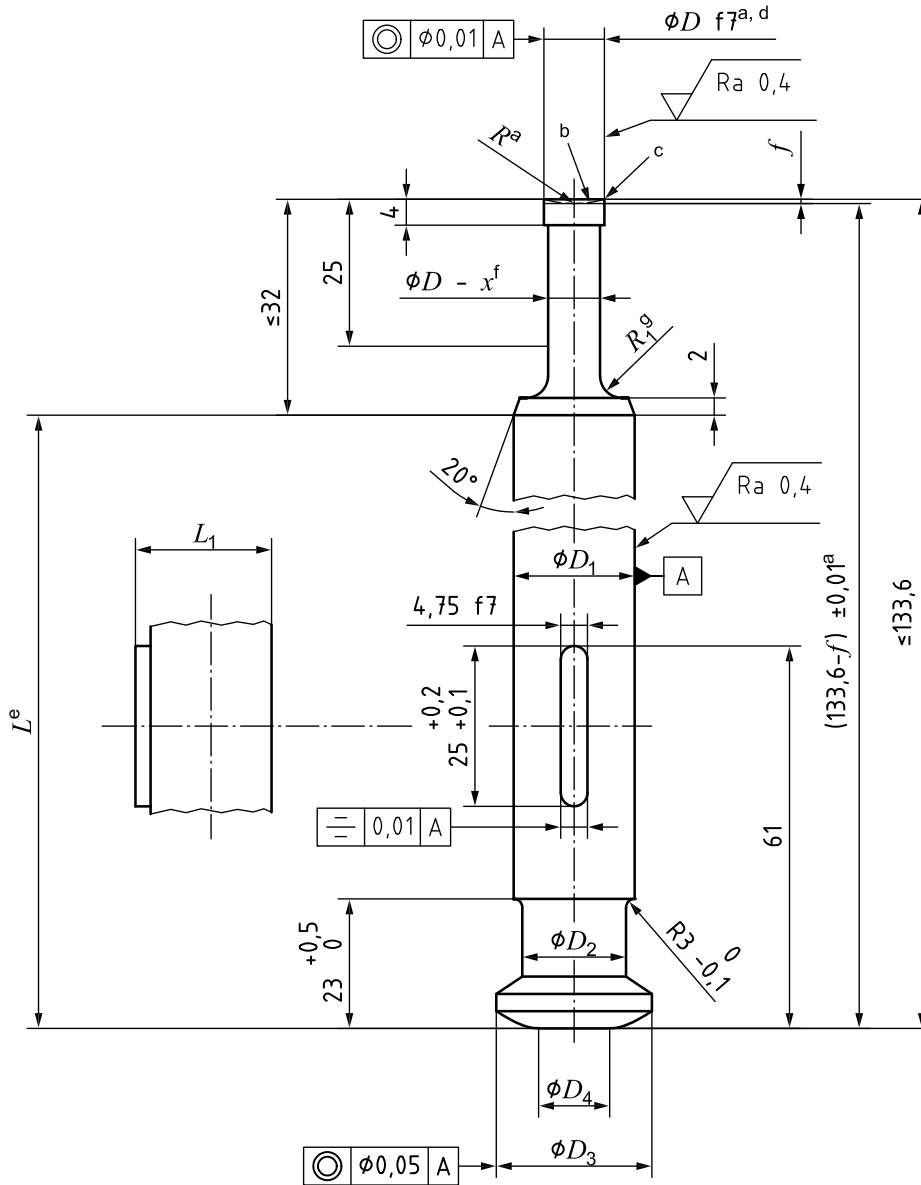
Dimensions in millimetres,
Surface roughness values in micrometres
General tolerance: ISO 2768-m



- a The values of D , R and $(133,6 - f) \pm 0,01$ shall be defined by the user.
- b The appearance of the cup radius and the land shall correspond to a polished mirror (i.e. $0,025 \mu\text{m} \leq Ra \leq 0,10 \mu\text{m}$).
- c The land (see Figure 2, key item 7) varies according to D and the tablet dimensions, and should be equal to:
 - 0,05 for $D < 5$
 - 0,1 for $5 \leq D < 20$
 - 0,2 for $D \geq 20$.
- d For shape tooling, the tolerance of all dimensions of the tip should correspond to f7 applied to the largest dimension.
- e The values of L shall be subject to agreement between the manufacturer and the user.
- f x shall be subject to agreement between the manufacturer and the user.
- g The value of the radius varies according to diameter D and the form.

Figure 5 — Lower punches without key

Dimensions in millimetres,
Surface roughness values in micrometres
General tolerance: ISO 2768-m



- a The values of D , R and $(133,6 - f) \pm 0,01$ shall be defined by the user.
- b The appearance of the cup radius and the land shall correspond to a polished mirror (i.e. $0,025 \mu\text{m} \leq Ra \leq 0,10 \mu\text{m}$).
- c The land (see Figure 2, key item 7) varies according to D and the tablet dimensions, and should be equal to:
 - 0,05 for $D < 5$
 - 0,1 for $5 \leq D < 20$
 - 0,2 for $D \geq 20$.
- d For shape tooling, the tolerance of all dimensions of the tip should correspond to f7 applied to the largest dimension.
- e The values of L shall be subject to agreement between the manufacturer and the user.
- f x shall be subject to agreement between the manufacturer and the user.
- g The value of the radius varies according to diameter D and the form.

Figure 6 — Lower punches with key

Table 2 — Dimensions of lower punches

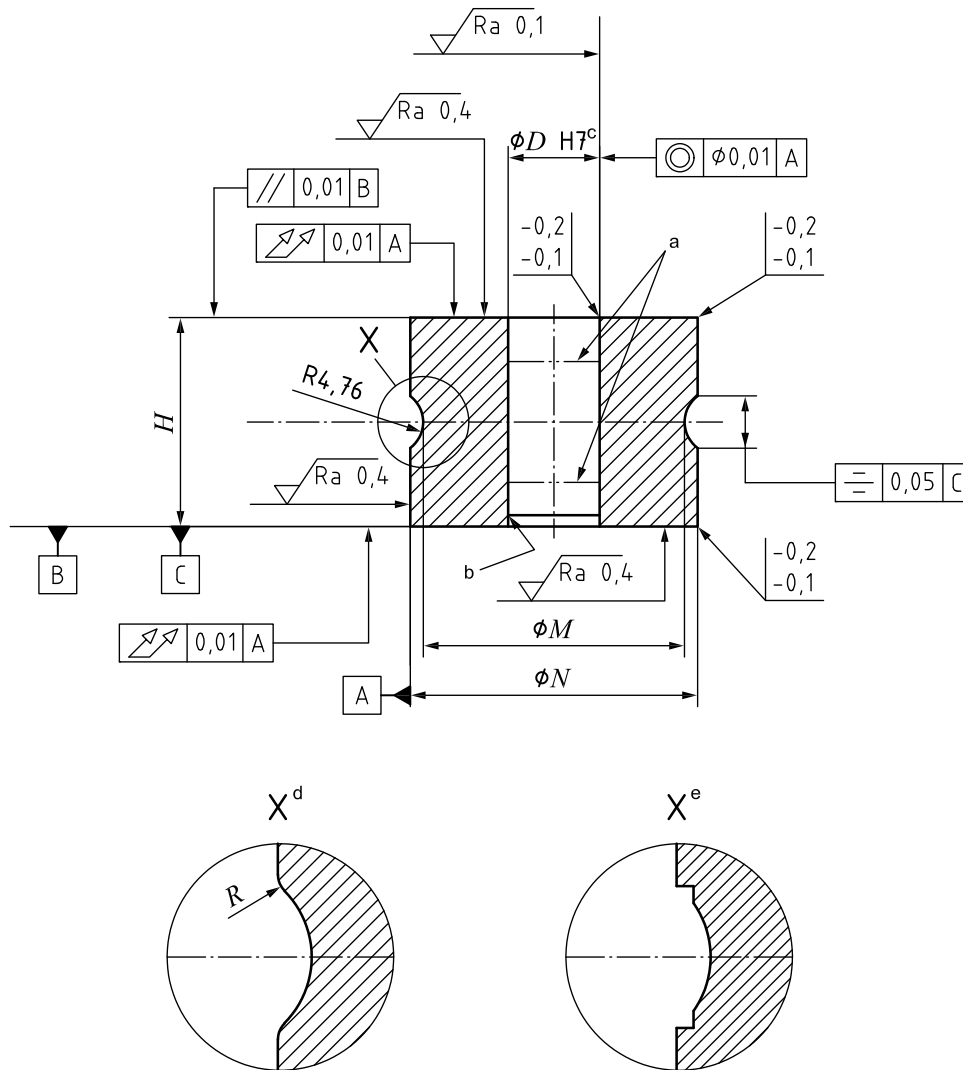
Dimensions in millimetres

D_1	D_2	D_3	D_4	L_1
h6	0 -0,1	0 -0,1	$\pm 0,2$	0 -0,2
19	15,8	25,27	9,6	20,7
25,35	22	31,6	16	27

4.2 Dies

The dimensions and tolerance of dies shall be in accordance with the indications of Figure 7 and Table 3.

Dimensions in millimetres,
Surface roughness values in micrometres
General tolerance: ISO 2768-m



- a Option tapered 1 % on 5 mm. Upon agreement between the user and the manufacturer, this may be different.
- b Chamfer or radius, according to agreement between the user and the manufacturer.
- c For shape tooling, the tolerance of all dimensions of the tip should correspond to H7 applied to the largest dimension.
- d Option with radius.
- e Option with groove.

Figure 7 — Dies

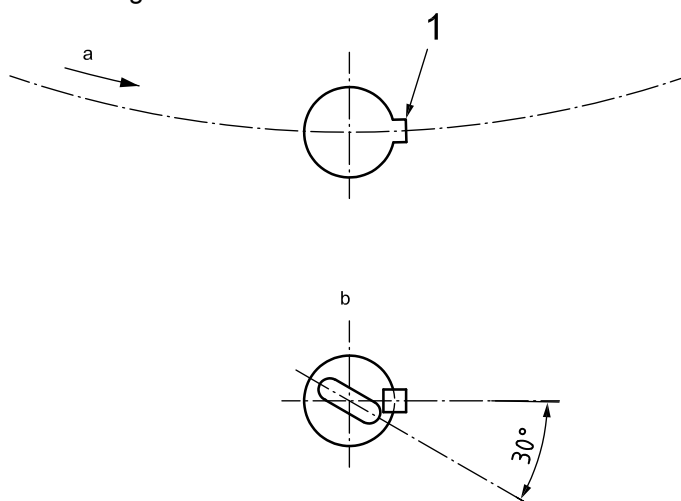
Table 3 — Dimensions for dies

Dimensions in millimetres

<i>N</i>	<i>M</i>	<i>H</i>
h6	$\pm 0,1$	h6
21	19,4	22,22
24	21,5	
30,16	27,8	
38,1	35,7	23,81

4.3 Positioning of punch with key in relation to machine turret and tablet shape to be executed

The positioning of punch with key in relation to machine turret and tablet shape to be executed shall be in accordance with the indications of Figure 8.



Key

- 1 key position in direction of rotation of turret
- a Direction of rotation of turret.
- b Top view of lower punch.

Figure 8 — Positioning of punch with key in relation to machine turret and tablet shape to be executed

5 Designation

5.1 Designation of punches

Punches according to this International Standard shall be designated by

- a) “Upper punch without key” or “Upper punch with key” or “Lower punch with key” or “Lower punch without key”;
- b) reference to this International Standard, i.e. ISO 18084;
- c) the punch diameter, D_1 , in millimetres.

EXAMPLE An upper punch with key having a diameter D_1 of 19 mm is designated as follows:

Upper punch with key ISO 18084 - 19

5.2 Designation of dies

Dies according to this International Standard shall be designated by:

- a) "Die";
- b) reference to this International Standard, i.e. ISO 18084;
- c) the die diameter, N , in millimetres.

EXAMPLE A die of diameter $N = 21$ mm is designated as follows:

Die ISO 18084 - 21

6 Marking

6.1 Marking of punches

Punches shall have marking which includes at least the following information:

- a) manufacturer's identification;
- b) number of the punch in the series;
- c) identification number.

6.2 Marking of dies

Dies shall have marking on one of the flat surfaces which includes at least the following information:

- a) manufacturer's identification;
- b) number of the die in the series;
- c) identification number.

7 Material

The material and hardness are left to the manufacturer's discretion.

Annex A
(normative)

Detail of punch head

The detail of the punch head is given in Figure A.1.

Dimensions in millimetres,
Surface roughness values in micrometres
General tolerance: ISO 2768-m

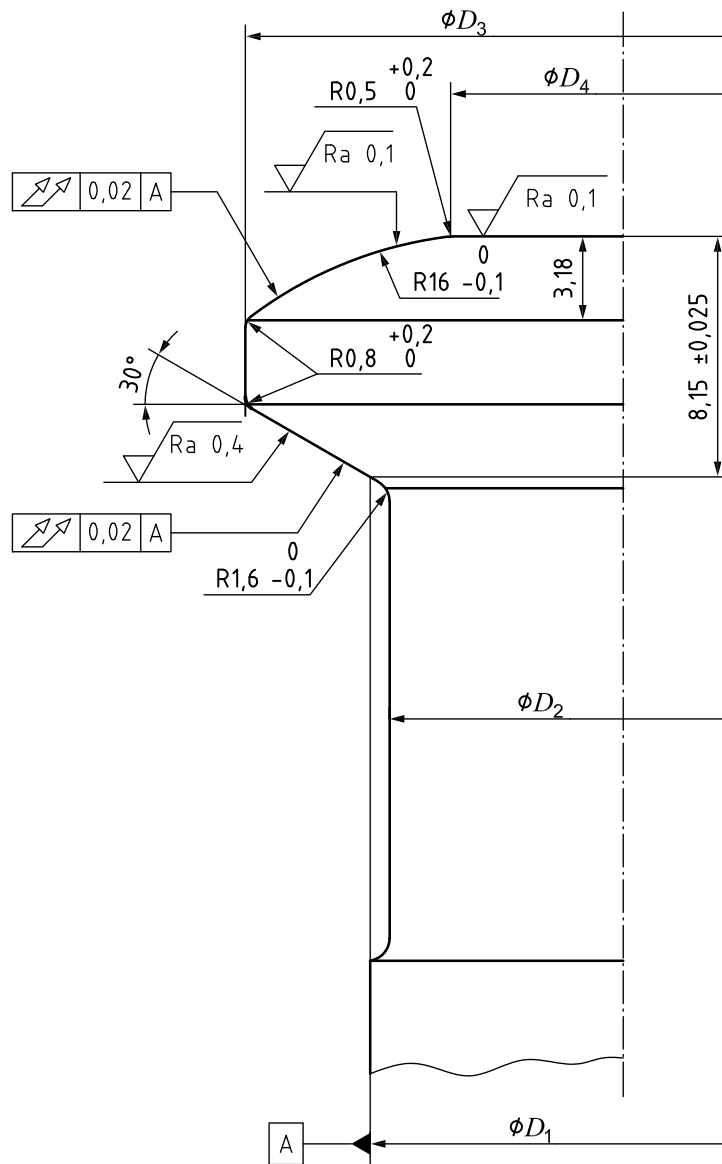


Figure A.1 — Detail of punch head

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- [1] ISO 1302:2002, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

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