भारतीय मानक

Indian Standard

IS 16799 : 2018
ISO 8977 : 2003

दाबन के औजार — मैट्रिक्स

Tools for Pressing — Matrixes

ICS 25.120.10

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November 2018 **Price Group 4**

Metal Forming Machines Sectional Committee, PGD 04

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 8977 : 2003 ‘Tools for pressing — Matrixes’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Metal Forming Machines Sectional Committee and approval of the Production and General Engineering Division Council.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appear to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard, which is to be substituted in its place, is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 8020 : 2002 Tools for pressing — Punches with cylindrical head and straight or reduced shank	IS 4296 (Part 2) : 2015 Tools for pressing: Part 2 Punches with cylindrical head and straight or reduced shank	Identical

This standard also makes a reference to the BIS Certification Marking of the product. Details of which are given in National Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
TOOLS FOR PRESSING — MATRIXES

1 Scope

This International Standard lays down the basic dimensions and tolerances in millimetres for headless and headed matrixes, in the outside diameter range of 5 mm to 50 mm.

It gives examples of material and hardness, and specifies a designation for matrixes that meet the requirements of this International Standard.

The dimensions and tolerances of the matrixes specified in this International Standard are adapted to conform to those for punches specified in ISO 8020.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

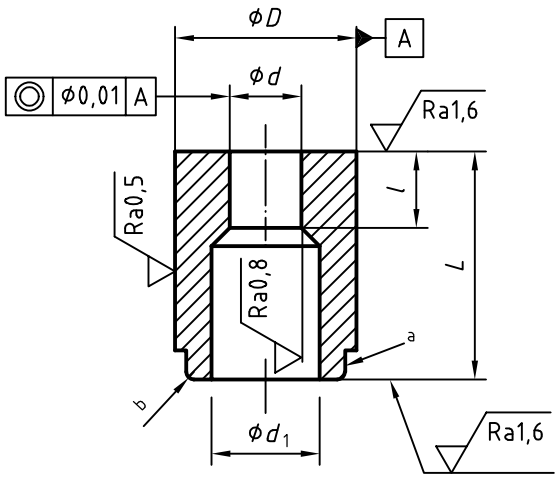
ISO 8020:2002,*Tools for pressing — Punches with cylindrical head and straight or reduced shank*

3 Dimensions

3.1 Matrixes with round cutting shapes

See Figures 1 and 2 and Table 1.

Surface roughness values in micrometres

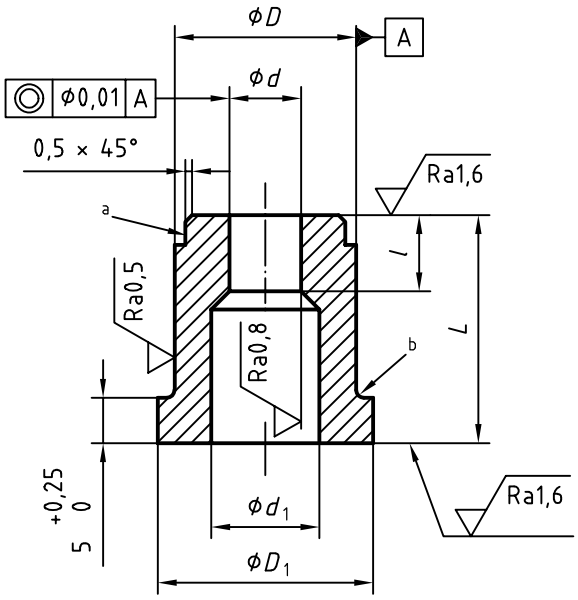


a Optional lead

b Chamfer left to the manufacturer's discretion

Figure 1 — Type A — Headless matrix with round cutting shape

Surface roughness values in micrometres



a Optional lead

b Execution left to the manufacturer's discretion

Figure 2 — Type B — Headed matrix with round cutting shape

Table 1 — Dimensions

Dimensions in millimetres

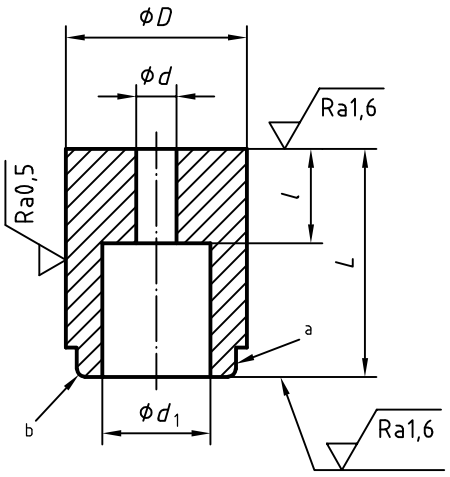
D		d	D_1	L			l		d_1
Type A	Type B	$^{+0,02}_{0}$	$^{0}_{-0,25}$	$^{+0,5}_{0}$					
n5[a]	m5[a]			20	25	32	min.	max.	max.
5		$1 \leqslant d \leqslant 2,4$	8	×			2		2,8
6		$1,6 \leqslant d \leqslant 3$	9	×	×		3		3,5
8		$2 \leqslant d \leqslant 3,5$	11	×	×		4		4
10		$2,5 \leqslant d \leqslant 5$	13	×	×	×	4	8	5,8
13		$4 \leqslant d \leqslant 7$	16	×	×	×	5	8	8
16		$6 \leqslant d \leqslant 9$	19	×	×	×	5	8	9,5
20		$8 \leqslant d \leqslant 11$	23	×	×	×	8	20	12
25		$10,7 \leqslant d \leqslant 16$	28	×	×	×	8	20	17,3
32		$15 \leqslant d \leqslant 20$	35	×	×	×	8	20	20,7
40		$19 \leqslant d \leqslant 27$	43		×	×	8	20	27,7
50		$26 \leqslant d \leqslant 36$	53			×	8	20	37

[a] h5 on special request.

3.2 Blank matrixes for shaped cutting shapes

See Figures 3 and 4 and Table 2.

Surface roughness values in micrometres

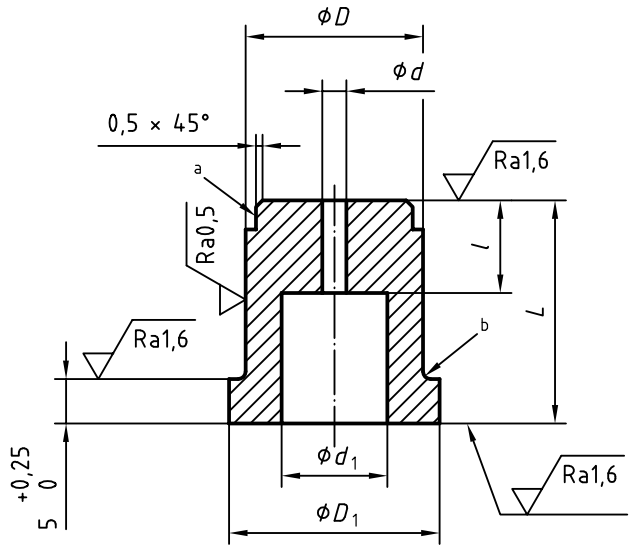


a Optional lead

b Chamfer left to the manufacturer's discretion

Figure 3 — Type C — Blank headless matrix with shaped cutting shape

Surface roughness values in micrometres



a Optional lead

b Execution left to the manufacturer's discretion

Figure 4 — Type D — Blank headed matrix with shaped cutting shape

Table 2 — Dimensions

Dimensions in millimetres

D Type C n5[a]	D Type D m5[a]	d	D_1 $^{0}_{-0,25}$	L $^{+0,5}_{0}$ 20	L 25	L 32	l min.	l max.	d_1 [b] max.
8		1	11	×	×		4		4
10		1	13	×	×	×	4	8	5,8
13		1,2	16	×	×	×	5	8	8
16		1,2	19	×	×	×	5	8	9,5
20		1,5	23	×	×	×	8	20	12
25		1,5	28	×	×	×	8	20	17,3
32		1,5	35	×	×	×	8	20	20,7
40		1,5	43		×	×	8	20	27,7
50		1,5	53			×	8	20	37

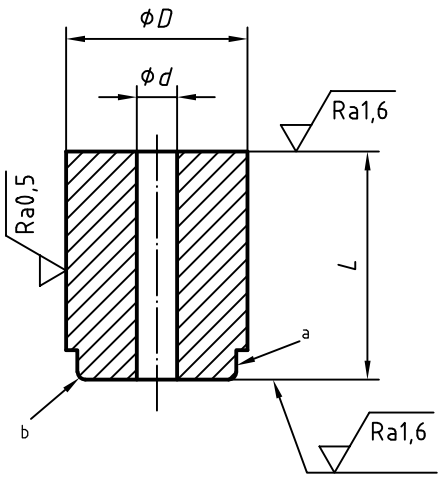
a h5 on special request.

b Shape of the bore is left to the manufacturer's discretion.

3.3 Matrix blanks

See Figures 5 and 6 and Table 3.

Surface roughness values in micrometres

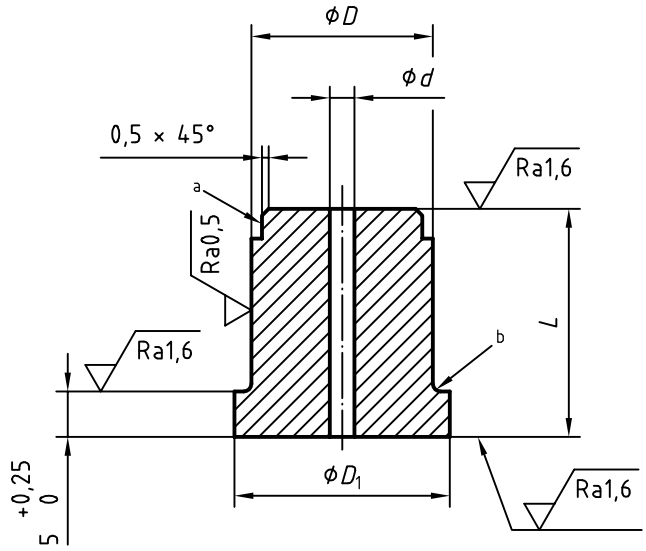


a Optional lead

b Chamfer left to the manufacturer's discretion

Figure 5 — Type E — Headless matrix blank

Surface roughness values in micrometres



a Optional lead

b Execution left to the manufacturer's discretion

Figure 6 — Type F — Headed matrix blank

Table 3 — Dimensions

Dimensions in millimetres

D		d	D_1 $^{0}_{-0,25}$	L $^{+0,5}_{0}$		
Type E n5[a]	Type F m5[a]			20	25	32
8		1	11	×	×	
10		1	13	×	×	×
13		1,2	16	×	×	×
16		1,2	19	×	×	×
20		1,5	23	×	×	×
25		1,5	28	×	×	×
32		1,5	35	×	×	×
40		1,5	43		×	×
50		1,5	53			×

[a] h5 on special request.

4 Material and hardness

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

a) alloyed cold work steel with 5 % to 12 % Cr: (60 ± 2) HRC;

b) high-speed steel: (62 ± 2) HRC.

5 Designation

Matrixes in accordance with this International Standard shall be designated by:

a) “Matrix”;

b) reference to this International Standard, i.e. ISO 8977;

c) the type of matrix (A, B, C, D, E, F, AS, AR, AO, BS, BR or BO);

d) its external diameter, D;

e) its tolerance on diameter D;

f) its point diameter, d (if required);

g) its overall length, L;

h) the depth of the working part, l;

i) its material (alloyed cold work steel with 5 % to 12 % Cr or high speed steel).

EXAMPLE A headless matrix, type A, of external diameter D = 10 mm with an h5 tolerance, point diameter d = 4 mm, total length L = 20 mm and having a depth of working part l = 4 mm in high speed steel is designated as follows:

Matrix ISO 8977 - A 10 h5 × 4 × 20 × 4 - high speed steel

Annex A
(informative)

Example of matrixes

A.1 General

Matrixes in accordance with this International Standard are also used with cutting shapes other than round ones. Examples for matrixes with square, rectangular or oblong shapes are shown in clause A.2. The dimensions of matrixes in clause A.2 are adapted to the types of punches in accordance with ISO 8020. Matrixes (punches) with other than round shapes are designed so that on assembly, they can only be mounted in one direction. This can be achieved by fitting the matrixes with a locking device. For matrixes, this device is always fitted on the longest side of the shape (profile) and thus complies with the requirements for punches in accordance with ISO 8020.

A.2 Examples for matrixes with individual cutting shapes

See Figures A.1 to A.6 (dimensions in millimetres) and Table A.1.

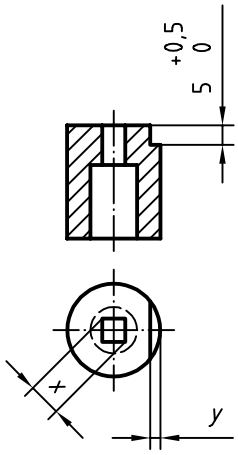


Figure A.1 — Type AS — Headless matrix with square cutting shape

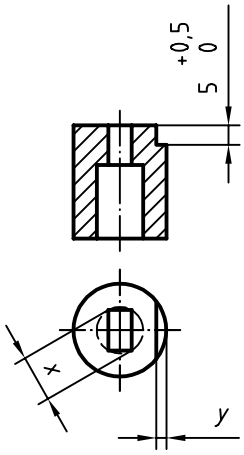


Figure A.2 — Type AR — Headless matrix with rectangular cutting shape

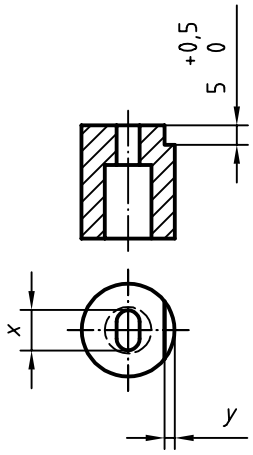


Figure A.3 — Type AO — Headless matrix with oblong cutting shape

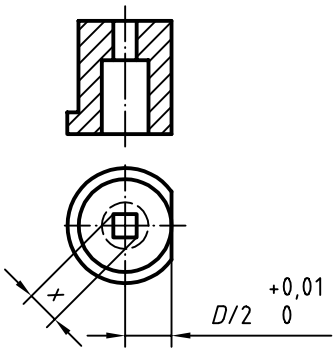


Figure A.4 — Type BS — Headed matrix with square cutting shape

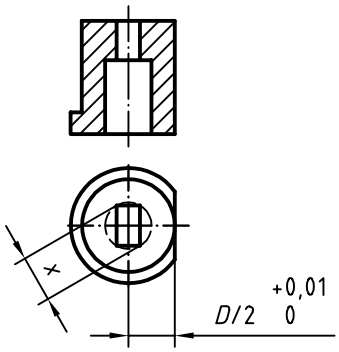


Figure A.5 — Type BR — Headed matrix with rectangular cutting shape

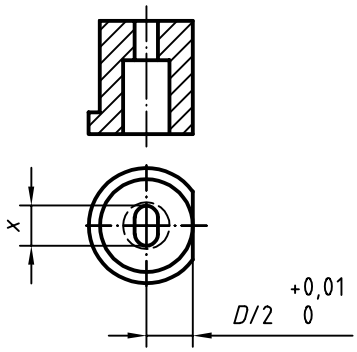


Figure A.6 — Type BO — Headed matrix with oblong cutting shape

Table A.1 — Dimensions

Dimensions in millimetres

D	x max.	y $^{0}_{-0,01}$
8	3,5	1
10	5	
13	7	1,5
16	9	
20	11	
25	16	2,5
32	20	
40	27	
50	36	

NATIONAL ANNEX A

(*National Foreword*)

A-1 BIS CERTIFICATION MARKING

The product may also be marked with the Standard Mark.

A-1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc No.: PGD 04 (10176).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi