भारतीय मानक
Indian Standard

IS 16927 : 2023
ISO 8404 : 2021

सचन के औज़ार — कोण पिन

(पहला पुनरीक्षण)

Tools for Moulding — Angle Pins

(First Revision)

ICS 25.120.30

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January 2023 **Price Group 7**

Metal Forming Machines Sectional Committee, PGD 04

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 8404 : 2021 'Tools for moulding — Angle pins 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.

This standard was originally published in 2018 identical with ISO 8404 : 2013. The first revision of this standard has been undertaken to align it with the latest version of the International Standard

The major changes in this revision are as follows :

a) Addition of two new types of angle pins : angle pins mounted with external thread (type C) and angle pins mounted with hexagon socket head cap screw (type D);
b) Correction of Figure 1;
c) Addition of indication of surface roughness under the head of headed angle pins (Figure 2);
d) Modification of the height of headed angle pins of diameter D1 = 40.

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 appears to certain International Standard for which Indian Standard also exist. The corresponding Indian Standard, which is to be substituted in its places is listed below along with its degree of equivalence for the editions indicated.

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 2768-1 General tolerances — Part 1 : Tolerances for linear and angular dimensions without individual tolerance indications	IS 2102 (Part 1) : 1993 General tolerances — Part 1 tolerances for linear and angular dimensions without individual tolerance indications (*third revision*)	Identical with ISO 2768-1 : 1989

The technical committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard :

International Standard	*Title*
ISO 4957	Tool steels

The 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 : 2022 'Rules for rounding off numerical values (*second revision*).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard

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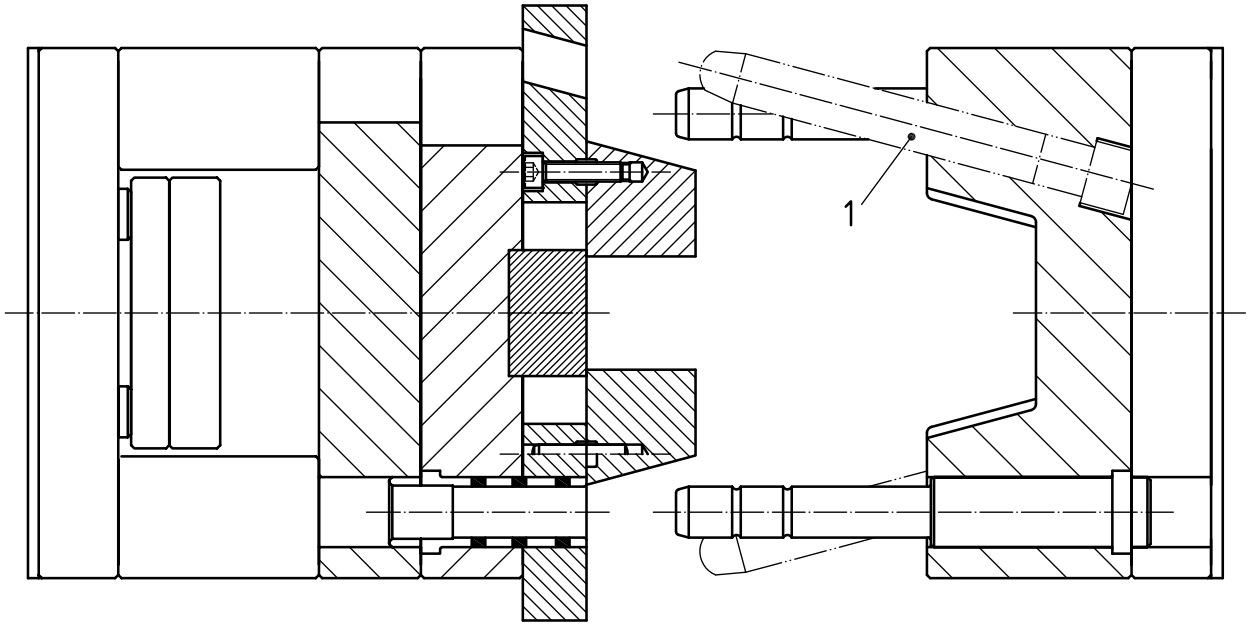
Introduction

An example of an application of this document is shown in Figure 1.



Key

1 angle pin (type A)

Figure 1 — Application example of a headed angle pin, type A

Indian Standard

TOOLS FOR MOULDING — ANGLE PINS

(First Revision)

1 Scope

This document specifies the basic dimensions, in millimetres, of headed angle pins (type A), straight angle pins (type B), angle pins mounted with external thread (type C) and angle pins mounted with hexagon socket head cap screw (type D), intended for use in diecasting dies and tools for moulding.

It also specifies the material hardness and designation of the angle pins (types A, B, C and D).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

ISO 4957, *Tool steels*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

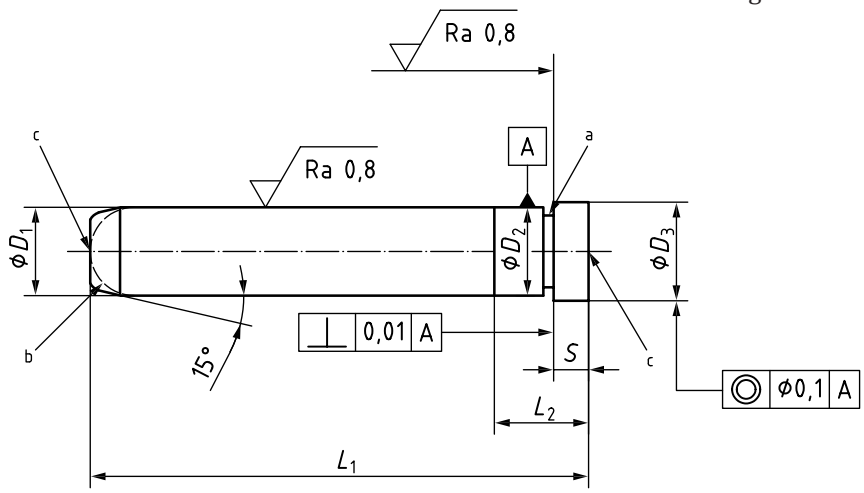
— IEC Electropedia: available at http://www.electropedia.org/

4 Dimensions

4.1 Type A — Headed angle pins

The dimensions of headed angle pins shall be in accordance with the indications of Figure 2 and Table 1.

Dimensions in millimetres
Surface roughness values in micrometres



a Radius or undercut.

b The leading end can be rounded. The choice of shape is left to the manufacturer's discretion.

c Optional centres.

The general tolerance shall be ISO 2768-m according to ISO 2768-1.

Figure 2 — Type A, headed angle pins

Table 1 — Dimensions of type A, headed angle pins

Dimensions in millimetres

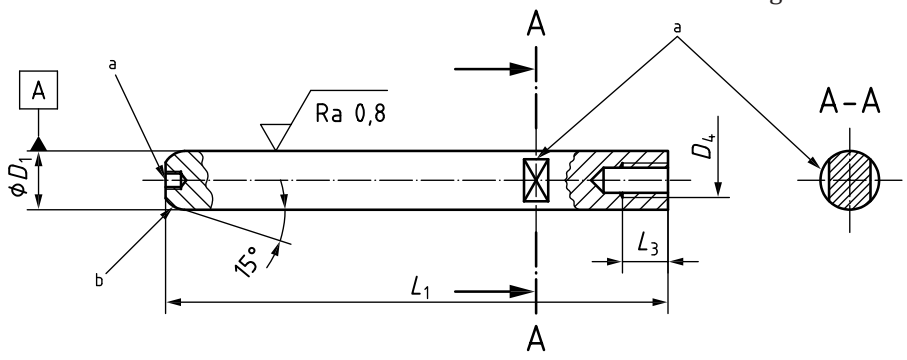
D_1 g6 D_2 m6	10	12	16	20	25	32	40
S_{min}	3	6	8	8	16	16	18
$D_3\ ^{0}_{-0,2}$	14	16	20	25	30	38	48
$L_1\ ^{0}_{-1,5}$	$L_2\ ^{-0,5}_{-1,0}$						
63	16	16					
80	16	16	26				
100	22	22	26	30			
125	22	22	26	30			
160			36	40			
200			36	40	42	47	54
250				40	42	47	62
315					42	54	62
400						54	62
500							71

NOTE Tolerance classes and limit deviations are defined in ISO 286-2.

4.2 Type B — Straight angle pins

The dimensions of straight angle pins shall be in accordance with the indications of Figure 3 and Table 2.

Dimensions in millimetres
Surface roughness values in micrometres



a Position and dimensions of width across flats or alternatively hexagon sockets are left to the manufacturer's discretion.

b The leading end can be rounded. The choice of shape is left to the manufacturer.

The general tolerance shall be ISO 2768-m according to ISO 2768-1.

Figure 3 — Type B, straight angle pin

Table 2 — Dimensions of type B, straight angle pin

Dimensions in millimetres

D_1 k6		10	12	16	20	25	32
D_4		M6	M6	M8	M10	M12	M16
L_3 $^{+1,5}_{0}$		12	12	16	20	24	32
L_1 $^{0}_{-1,5}$	63	x	x	x	x		
	80	x	x	x	x	x	
	100	x	x	x	x	x	x
	125	x	x	x	x	x	x
	160			x	x	x	x
	200			x	x	x	x
	250				x	x	x
	315					x	x
	400						x

Key

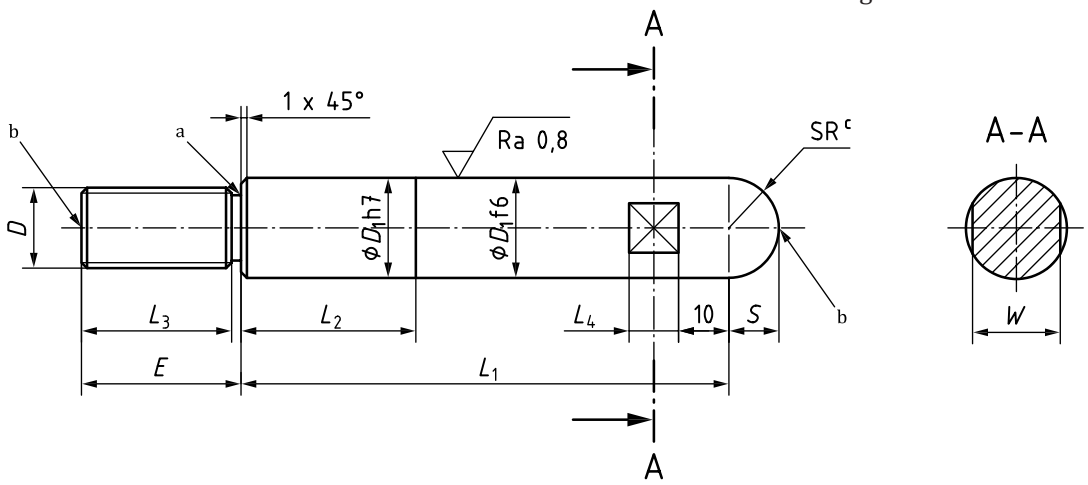
x standardized dimensions

NOTE Tolerance classes and limit deviations are defined in ISO 286-2.

4.3 Type C — Angle pins mounted with external thread

The dimensions of angle pins mounted with external thread shall be in accordance with the indications of Figure 4 and Table 3.

Dimensions in millimetres
Surface roughness values in micrometres



a Radius or undercut.

b Optional centres.

c SR = $D_1/2$.

The general tolerance shall be ISO 2768-m according to ISO 2768-1.

NOTE Tolerance classes and limit deviations are defined in ISO 286-2.

Figure 4 — Type C, angle pins mounted with external thread

Table 3 — Dimensions of type C, angle pins mounted with external thread

Dimensions in millimetres

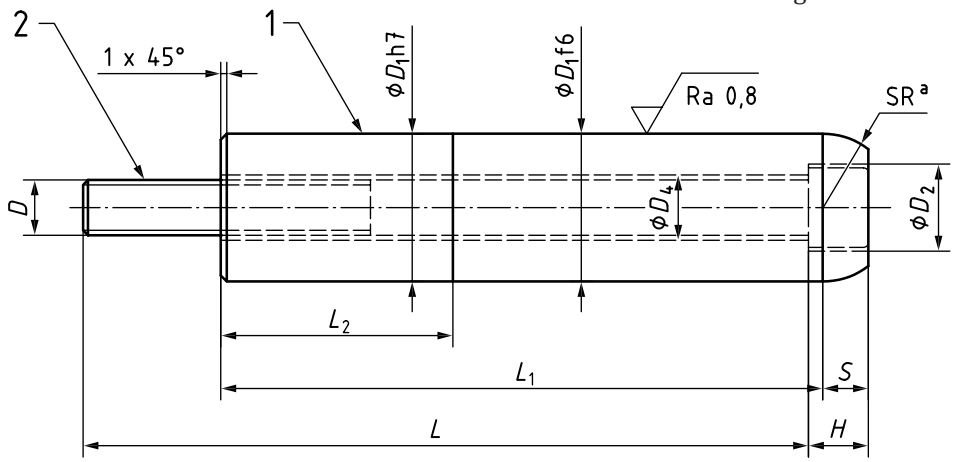
D_1	D	L_2	L_3	L_4	E	S	W	$L_1 \pm 0,2$								
								40	50	60	80	100	125	160	200	250
10	M6	$0 \leq L_2 < L_1$	15	8	17	5	7	x	x	x	x	x	x	x	x	
12	M8		20	10	22	6,5	10		x	x	x	x	x	x	x	x
16	M12		25	10	27	8	13		x	x	x	x	x	x	x	x
20	M16		30	12	32	10	17			x	x	x	x	x	x	x

Key
x standardized dimensions

4.4 Type D — Angle pins mounted with hexagon socket head cap screw

The dimensions of angle pins mounted with hexagon socket head cap screw shall be in accordance with the indications of Figure 5 and Table 4.

Dimensions in millimetres
Surface roughness values in micrometres



Key

1 angle pin

2 hexagon socket head cap screw

NOTE Tolerance classes and limit deviations are defined in ISO 286-2.

[a] SR = $D_1/2$.

The general tolerance shall be ISO 2768-m according to ISO 2768-1.

Figure 5 — Type D, angle pins mounted with hexagon socket head cap screw

Table 4 — Dimensions of type D, angle pins mounted with hexagon socket head cap screw

Dimensions in millimetres

D_1	D	D_2	D_4	L	L_2	H	S	$L_1 \pm 0,2$								
								50	60	80	100	125	160	200	250	300
16	M6	11	7	60~210	$0 \le L_2 < L_1$	6,5	5	x	x	x	x	x	x	x		
20	M8	14	9	60~270		9	6	x	x	x	x	x	x	x	x	
25	M10	17	11			11	8	x	x	x	x	x	x	x	x	
30	M12	19	14			13	10		x	x	x	x	x	x	x	
32	M12	19	14			13	10		x	x	x	x	x	x	x	
35	M16	25	18	60~320		17	10		x	x	x	x	x	x	x	x
40	M16	25	18			17	14		x	x	x	x	x	x	x	x

Key

x standardized dimensions

5 Material and hardness

Angle pins shall be made from tool steel in accordance with ISO 4957. The hardness values shall be as follows:

— shaft: (62 ± 2) HRC;

— head (type A): (45 ± 5) HRC.

NOTE Rockwell C hardness (HRC) is defined in ISO 6508 (all parts).

6 Designation

Angle pins for diecasting dies and tools for moulding in accordance with this document shall be designated by the following:

a) "Angle pin";

b) a reference of this document, i.e. ISO 8404;

c) the type of angle pin (type A or B or C or D);

d) its diameter D_1, in millimetres;

e) its length L_1, in millimetres.

EXAMPLE A type A angle pin with a diameter D_1 = 20 mm and a length of L_1 = 160 mm is designated as follows:

Angle pin ISO 8404 - A 20 × 160

Bibliography

[1] ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

[2] ISO 6508 (all parts), *Metallic materials — Rockwell hardness test*

NATIONAL ANNEX A

(National Foreword)

A-1 BIS CERTIFICATION MARKING

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked withthe Standard Mark.

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.

Copyright

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 website-www.bis.gov.in or www.standardsbis.in.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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