INTERNATIONAL STANDARD

ISO 8405

Fourth edition
2020-10

Tools for moulding — Ejector sleeves with cylindrical head — Basic series for general purposes

Outillage de moulage — Éjecteurs tubulaires à tête cylindrique — Série de base pour usages généraux

Reference number
ISO 8405:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO 8405:2013) which has been technically revised.

The main changes compared to the previous edition is as follows:

— addition of ejector sleeves of diameter 0,8, 1,2, 1,5, 1,6, 1,7, 3,5, 3,7, 4,5, 7, 8,5, 9, 10,5, 11, 14 and 16;

— correction of the formulae giving the value of concentricity tolerance, t;

— addition of a surface roughness of 1,6 at the end of the ejector sleeve shaft and of 3,2 on diameter D_3;

— modification of the indication of the hardness of shaft for hot worked steel.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Tools for moulding — Ejector sleeves with cylindrical head — Basic series for general purposes

1 Scope

This document specifies the dimensions and tolerances, in millimetres, of ejector sleeves with cylindrical head which are used in compression and injection moulds and in diecasting dies.

It also gives material guidelines and hardness requirements, and specifies the designation of ejector sleeves with cylindrical head.

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 6751, *Tools for moulding — Ejector pins with cylindrical head*

3 Terms and definitions

No terms and definition are listed in this document

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

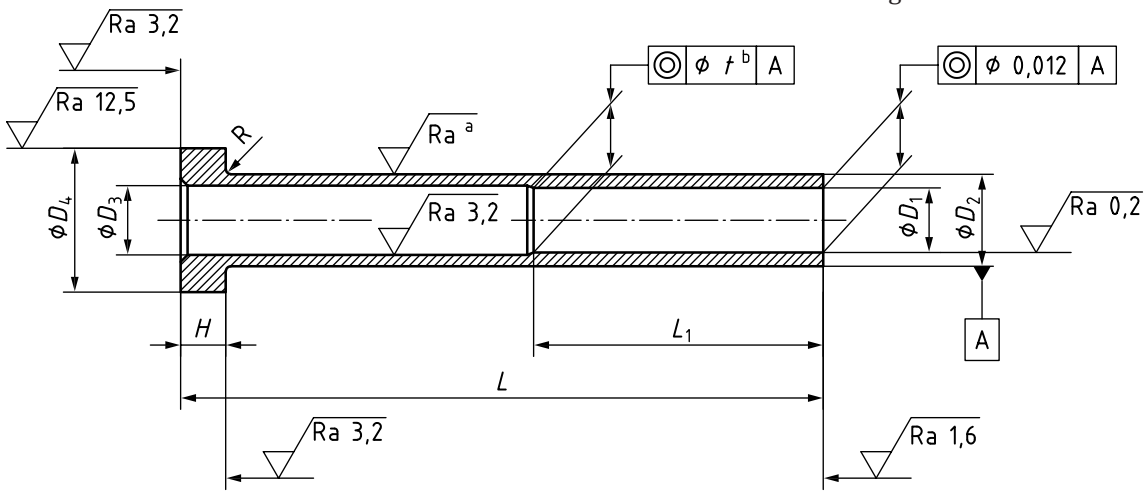
— ISO Online browsing platform: available at https://www.iso.org/obp

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

4 Dimensions

The dimensions of ejector sleeves with cylindrical head shall be in accordance with the indications of Figure 1 and Table 1.

Surface roughness values in micrometres



a Ra 0,8 for hot worked steel. Ra 0,4 for alloyed cold worked steel.

b $t = 0{,}012\ (L_1 \times 10^{-1})$
where L_1 is expressed in millimeters.

Figure 1 — Ejector sleeves

Table 1 — Ejector sleeves

Dimensions in millimetres

D_1[a] H5		D_2 g6	D_3	D_4 0 −0,2	L_1 ±1 0	L ±1 0										H[b] 0 −0,05	R +0,2 0
Standard size	Over-size					75	100	125	150	175	200	225	250	275	300		
0,8		4	$2{,}4^{+0{,}1}_{-0{,}1}$	8	12	×	×									3	0,3
1,2					20	×	×										
1,5						×	×	×	×								
1,6						×	×	×	×	×							
1,7						×	×	×	×	×							
2			$2{,}5^{+0{,}2}_{-0{,}1}$		35	×	×	×									
	2,2					×	×	×	×	×	×	×	×				
2,5		5	$3^{+0{,}2}_{-0{,}1}$	10		×	×	×									
	2,7					×	×	×	×	×	×	×					
3			$3{,}5^{+0{,}2}_{-0{,}1}$			×	×	×	×								
	3,2					×	×	×	×	×	×	×	×	×			

Key

× standardized dimensions

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

a For repair, the following diameters for D_1 are recommended: 2,2; 2,7; 3,2; 3,7, 4,2; 5,2; 6,2; 8,2; 10,2; 12,5.

b For shaft diameters, D_2, larger than those given in this table, up to 32 mm, the ratio of head height and diameter shall be the same as for ejector pins given in ISO 6751.

Table 1 *(continued)*

D_1[a] H5		D_2 g6	D_3	D_4 0 −0,2	L_1 +1 0	L +1 0										H[b] 0 −0,05	R +0,2 0
Standard size	Over-size					75	100	125	150	175	200	225	250	275	300		
3,5		6	$4^{+0,2}_{-0,1}$	12	45	×	×	×	×	×	×	×	×	×		5	0,5
	3,7					×	×	×	×	×	×	×	×				
4		8	$4,5^{+0,2}_{-0,1}$	14		×	×	×	×	×	×						
	4,2		$5^{+0,2}_{-0,1}$			×	×	×	×	×	×	×	×	×			
4,5						×	×	×	×	×	×	×	×	×			
5			$5,5^{+0,3}_{-0,1}$			×	×	×	×	×	×						
	5,2					×	×	×	×	×	×	×	×	×			
6		10	$6,5^{+0,3}_{-0,1}$	16			×	×	×	×	×	×	×				
	6,2					×	×	×	×	×	×	×	×	×	×		
7		12	$7,5^{+0,3}_{-0,1}$	20			×		×		×		×		×	7	0,8
8			$8,5^{+0,3}_{-0,1}$				×	×	×	×	×	×	×	×	×		
	8,2					×	×	×	×	×	×	×	×	×	×		
8,5			$9^{+0,3}_{-0,1}$				×	×	×	×	×	×	×	×	×		
9		14	$9,5^{+0,3}_{-0,1}$	22			×		×		×		×		×		
10			$10,5^{+0,3}_{-0,1}$				×	×	×	×	×	×	×	×	×		
	10,2						×	×	×	×	×	×	×	×	×		
10,5			$11^{+0,3}_{-0,1}$				×	×	×	×	×	×	×	×	×		
11			$11,5^{+0,3}_{-0,1}$				×		×		×		×		×		
12		16	$12,5^{+0,3}_{-0,1}$					×	×	×	×	×	×	×	×		
	12,5		$13^{+0,3}_{-0,1}$				×	×	×	×	×	×	×	×	×		
14		18	$14,5^{+0,3}_{-0,1}$	26			×	×	×	×	×	×	×	×	×		
16		20	$16,5^{+0,3}_{-0,1}$		55		×	×	×	×	×	×	×	×	×	8	1

Key

× standardized dimensions

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

[a] For repair, the following diameters for D_1 are recommended: 2,2; 2,7; 3,2; 3,7, 4,2; 5,2; 6,2; 8,2; 10,2; 12,5.

[b] For shaft diameters, D_2, larger than those given in this table, up to 32 mm, the ratio of head height and diameter shall be the same as for ejector pins given in ISO 6751.

5 Material and hardness

Ejector sleeves with cylindrical head shall be made of hot worked steel or alloyed cold worked steel. The hardness of the shaft and head, respectively, are given in Table 2.

Table 2 — Material and hardness

Material	Hardness[a]	
	Shaft	Head
Hot worked steel	min. 1 400 MPa core strength Nidriting min. 950 HV 0,3	(45 ± 5) HRC hot-forged
Alloyed cold worked steel	(60 ± 2) HRC	
NOTE 1 Rockwell C hardness (HRC) is defined in ISO 6508 (all parts).		
NOTE 2 Vickers hardness (HV) is defined in ISO 6507 (all parts).		
[a] The point at which hardness is measured is left to the manufacturer's discretion.		

6 Designation

Ejector sleeves with cylindrical head according to this document shall be designated by the following:

a) "Ejector sleeve with cylindrical head";

b) a reference to this document (i.e. ISO 8405);

c) the diameter, D_1, in millimetres;

d) the length, L, in millimetres;

e) the material.

EXAMPLE An ejector sleeve with cylindrical head with diameter D_1 = 2 mm, length L = 75 mm, and made of hot worked steel is designated as follows:

Ejector sleeve with cylindrical head ISO 8405 - 2 - 75 - Hot worked steel

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 6507 (all parts), *Metallic materials — Vickers hardness test*

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