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## Tools for moulding — Flat ejector pins

*Outillage de moulage — Éjecteurs lames*

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Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
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Published in Switzerland

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 8693 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

This third edition cancels and replaces the second edition (ISO 8693:1998), of which it constitutes a minor revision. In particular, the indication of surface textures has been updated in accordance with ISO 1302:2002.

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# Tools for moulding — Flat ejector pins

## 1 Scope

This International Standard specifies the dimensions and tolerances, in millimetres, of flat ejector pins which are used in compression and injection moulds and in die casting dies.

It also gives material guidelines and hardness requirements, and specifies the designation of flat ejector pins.

Ejector pins with cylindrical head are specified in ISO 6751; shouldered ejector pins are specified in ISO 8694.

## 2 Dimensions

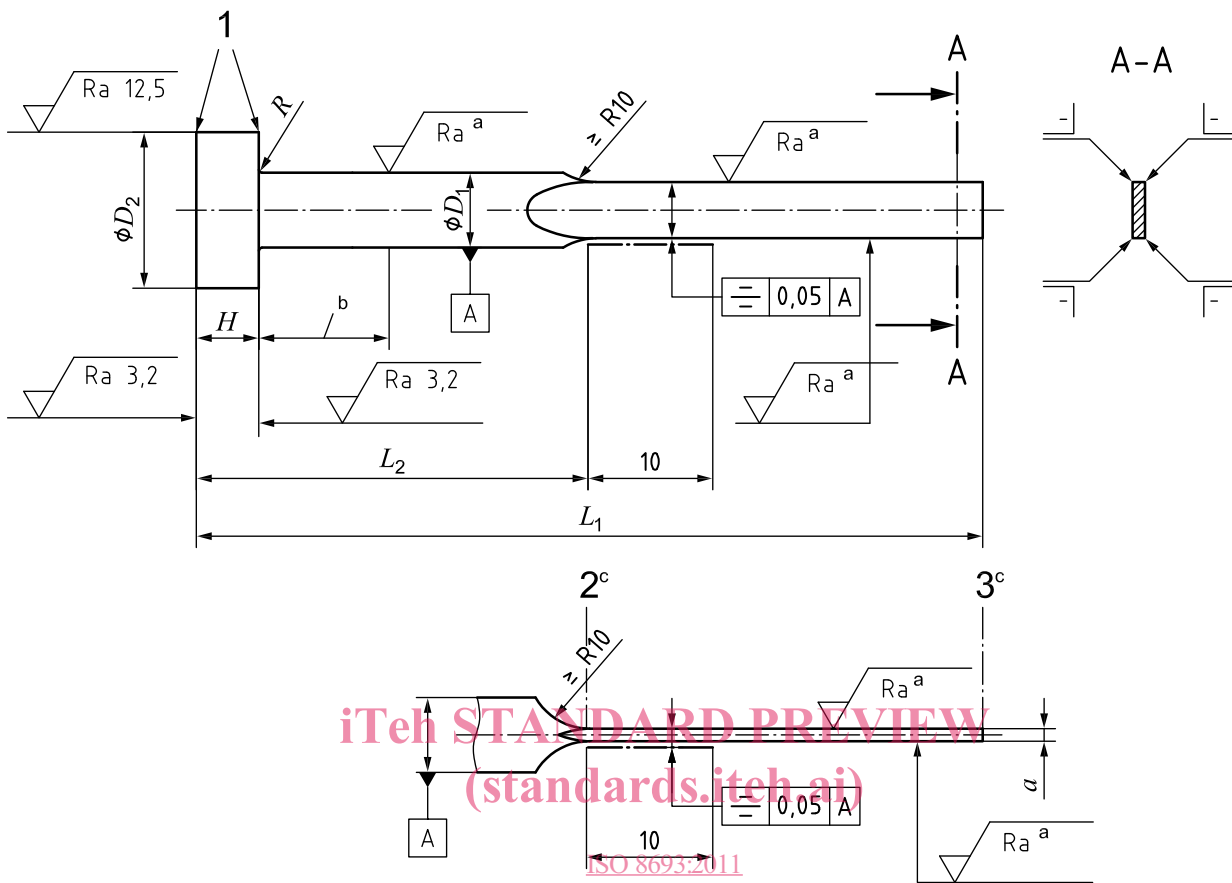
The dimensions of flat ejector pins shall be in accordance with the indications of Figure 1 and Tables 1 and 2.

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Surface roughness values in micrometres



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**Key**

- 1 edges without burrs
- 2 gauge plane 2
- 3 gauge plane 1
- <sup>a</sup>  $Ra\ 0,8$  for hot worked steel.  $Ra\ 0,4$  for alloyed cold worked steel.
- <sup>b</sup> It is permitted to provide the ejector pin with an alternative surface roughness or a small variation on the diameter,  $D_1$ , for a certain length.
- <sup>c</sup> See note a to Tables 1 and 2.

**Figure 1 — Flat ejector pins**

Table 1 — Flat ejector pins of hot worked steel

Dimensions in millimetres

$D_1$	$D_2$	$a^a$	$b^a$	$L_1$										$H$	$R$	
				$+2$												
				$0$												
				$-0$												
				63	80	100	125	160	200	250	315	400				
				$L_2$												
				$-1$												
				$-2$												
				32	40	50	63	80	100	125	160	200				
4	8	0,8	3,5	X	X	X	X						3	0,3		
		1		X	X	X	X									
		4,2	3,8	X	X	X	X									
		4	3,5		X	X	X	X								
		4,2		3,8		X	X	X	X							
		5	10	1	4,5		X	X	X	X						
				1,2				X	X	X						
		6	12	1,5	5,5		X	X	X	X						5
2						X	X	X								
8	14	1,5	7,5					X	X	X	X	7	0,8			
		2						X	X	X	X					
10	16	1,5	9,5						X	X	X	7	0,8			
		2						X	X	X	X					
12	18	2	11,5						X	X	X	7	0,8			
		2,5						X	X	X	X					
16	22	2	15,5						X	X	X	7	0,8			
		2,5						X	X	X	X					

<sup>a</sup> These limit dimensions apply to 100 mm length. For lengths greater than 100 mm, the limit deviations shall be multiplied by  $(L_1 - L_2) \times 10^{-2}$ . The dimensional tolerance is at its maximum at gauge plane 2.

Table 2 — Flat ejector pins of alloyed cold worked steel

Dimensions in millimetres

$D_1$ h11	$D_2$ 0 -0,2	$a^a$ 0 -0,015	$b^a$ 0 -0,015	$L_1$ +2 0								$H$ 0 -0,05	$R$ +0,2 0
				63	80	100	125	160	200	250	315		
				$L_2$ -1 -2									
				32	40	50	63	80	100	125	160		
4	8	0,8	3,5	X	X	X	X					3	0,3
		1		X	X	X	X						
4,2		3,8	X	X	X	X							
4		1,2	3,5		X	X	X	X					
4,2	3,8			X	X	X	X						
5	10	1	4,5		X	X	X	X				5	0,5
		1,2				X	X	X					
6	12	1,5	5,5			X	X	X	X			7	0,8
		2				X	X	X					
8	14	1,5	7,5				X	X	X	X		5	0,5
		2					X	X	X				
10	16	1,5	9,5					X	X	X	X	7	0,8
		2						X	X	X			
12	18	2	11,5						X	X	X	7	0,8
		2,5						X	X	X			

<sup>a</sup> These limit dimensions apply to 100 mm length. For lengths greater than 100 mm, the limit deviations shall be multiplied by  $(L_1 - L_2) \times 10^{-2}$ . The dimensional tolerance is at its maximum at gauge plane 2.

### 3 Material and hardness

Flat ejector pins shall be made of hot worked steel or alloyed cold worked steel. The hardness of the shaft and head shall conform to the indication of Table 3.



Table 3 — Material and hardness

Material	Hardness <sup>a</sup>	
	Shaft	Head
Hot worked steel	Min. 1 400 MPa core strength min. 950 HV 0,3	(45 ± 5) HRC hot-forged
Alloyed cold worked steel	(60 ± 2) HRC	
<sup>a</sup> The point at which hardness is measured is left to the manufacturer's discretion.		

#### 4 Designation

Flat ejector pins according to this International Standard shall be designated by:

- a) "Flat ejector pin";
- b) reference to this International Standard, i.e. ISO 8693;
- c) the width,  $a$ , and thickness,  $b$ , in millimetres;
- d) the length,  $L_1$ , in millimetres;
- e) the material.

EXAMPLE A flat ejector pin with width  $a = 0,8$  mm, thickness  $b = 3,5$  mm, length  $L_1 = 63$  mm and made of hot worked steel is designated as follows:

**Flat ejector pin ISO 8693 - 0,8 × 3,5 - 63 - Hot worked steel**