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**Tools for pressing — Spring plungers  
with helicoidal compression steel  
spring or gas spring**

*Outillage de presse — Poussoirs à ressort compressés par ressort  
hélicoïdal en acier ou par ressort à gaz*

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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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.

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](http://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](http://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](http://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*.

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](http://www.iso.org/members.html).

## Introduction

This document was developed on the basis of VDI/Guideline 3004 "Spring plungers with helical compression steel spring or nitrogen gas spring".

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# Tools for pressing — Spring plungers with helicoidal compression steel spring or gas spring

## 1 Scope

This document specifies dimensions, stroke and forces of spring plungers with steel spring or gas spring.

This document applies to spring plungers which are used in tool manufacture for separating the tool and the sheet-metal part after stamping or forming operations.

It also gives information concerning their use and installation example of spring plungers steel spring or gas spring.

## 2 Normative references

There are no normative references in this document.

## 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 Basic principles

In the case of spring plungers with steel springs or gas springs, lateral forces are to be kept as low as possible. In the gas spring version, the filler opening is located vertically in the cylinder bottom (no filling through the piston rod).

## 5 Calculation basics

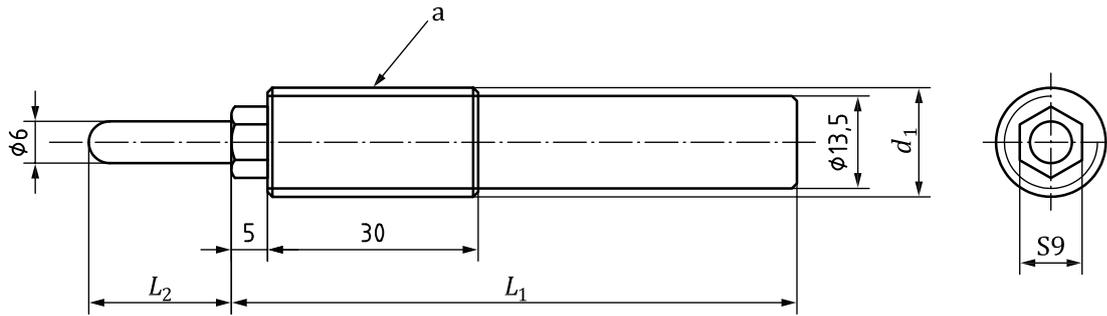
The calculation basics for spring plungers with gas springs are identical to those in the ISO 11901 series, except that the maximum impact velocity of 0,8 m/s shall not be exceeded.

Maximum recommended working stroke is 90 % of  $L_2$  (see [Table 2](#)).

## 6 Dimensions

### 6.1 Spring plunger with steel spring

The dimensions of spring plungers with steel spring shall be in accordance with the indications of [Figure 1](#) and [Table 1](#).



**Key**

- S width across flat (see ISO 272)
- a The thread shall be locally fixed by any locking device.

**Figure 1 — Spring plunger with steel spring – Version with maintenance-free guide bush for absorbing axial forces and bending compressive stress**

**Table 1 — Dimension for spring plunger with steel spring**

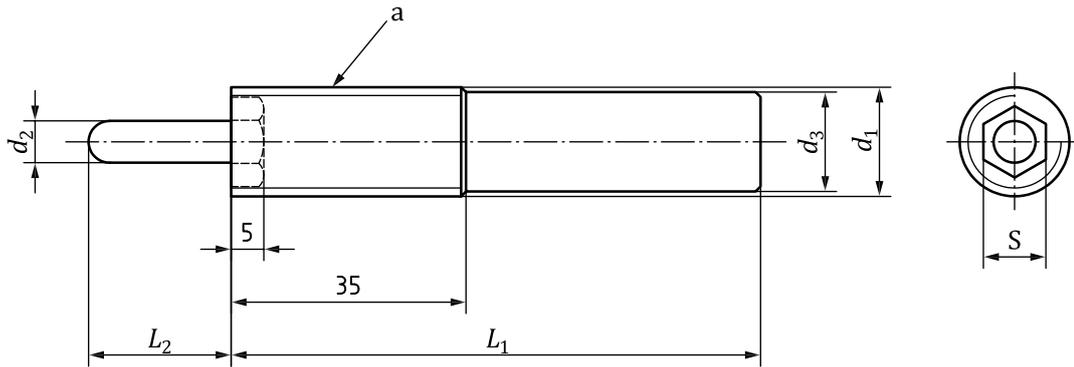
$d_1$	$L_1$ mm	$L_2$ max. stroke mm	Initial force approximately N	Final force approximately N	Comment
M16 × 1,5	60	15	15	56	—
	80	20	15	75	—
	150	50	13	47	version with maintenance-free guide bush for absorbing axial forces and bending compressive stress

**6.2 Spring plunger with gas spring**

The dimensions of spring plungers with gas spring shall be in accordance with the indications of [Figure 2](#), [Figure 5](#) and [Table 2](#).

The dimensions of the fitting tool for spring plungers with gas spring shall be in accordance with the indications of [Figure 3](#).

**CAUTION — It is not allowed for safety reasons to remove forward sealing set.**

**Key**

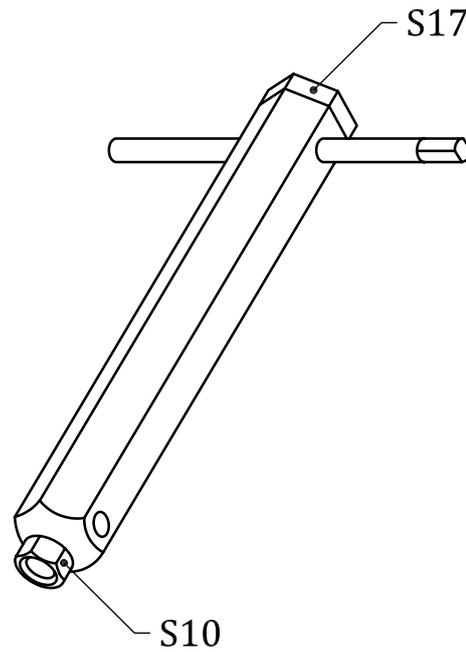
- S width across flat (see ISO 272)  
 a The thread shall be locally fixed by any locking device.

**Figure 2 — Spring plunger with gas spring****Table 2 — Dimensions for spring plunger with gas spring**

$d_1$	$d_2$	$d_3$ max.	$d_4$	$L_1$ max.	$L_2$ max. stroke	S	Initial force <sup>a</sup>	
							(at 20 bar)	(at 150 bar)
	mm	mm	mm	mm	mm	mm	N	N
M16 × 1,5	6	13,5	20	80	20	10	56	425
				110	50			
				140	80			
M24 × 1,5	12	21,5	28	80	20	17	226	1696
				110	50			
				140	80			

<sup>a</sup> The filling pressure is measured at 20 °C.

**CAUTION — Lateral forces shall not be applied if spring plungers with gas spring are used.**



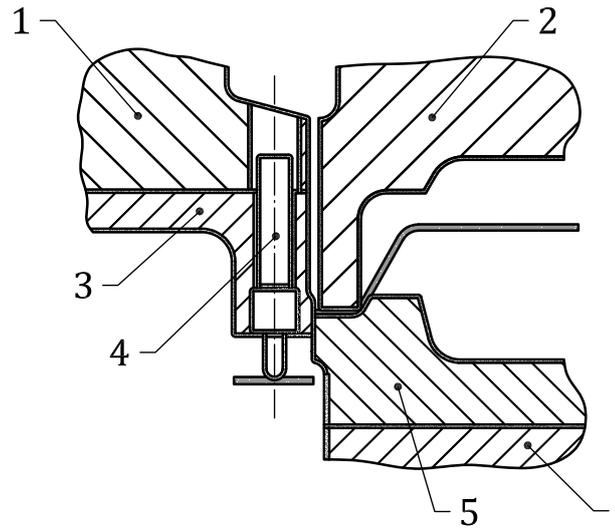
**Key**

S width across flat (see ISO 272)

**Figure 3 — Fitting tool for spring plungers with gas spring**

## 7 Installation example

An installation example of gas spring plunger for snipping application is given in [Figure 4](#).

**Key**

- initial position of the sheet before snipping operation
- 1 upper die
- 2 blank holder
- 3 cutting bar
- 4 spring plunger (secure against dropping out)
- 5 cutting bar
- 6 lower die

**Figure 4 — Installation example of gas spring plunger for snipping application**

An installation example of plunger with steel spring and with gas spring is given in [Figure 5](#).