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**Road vehicles — Pneumatic braking  
systems —**

**Part 2:**

Pipes, male fittings and tapped holes with  
conical sealing surface

*Véhicules routiers — Dispositifs de freinage pneumatique —*

*Partie 2: Tuyauteries, raccords mâles et logements à surface d'étanchéité  
conique*



## Foreword

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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.

International Standard ISO 4039-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 2, *Braking systems and equipment*.

ISO 4039 consists of the following parts, under the general title *Road vehicles — Pneumatic braking systems*:

- *Part 1: Pipes, male fittings and tapped holes with facial sealing surface*
- *Part 2: Pipes, male fittings and tapped holes with conical sealing surface*

Annexes A and B of this part of ISO 4039 are for information only.

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# Road vehicles — Pneumatic braking systems —

## Part 2:

## Pipes, male fittings and tapped holes with conical sealing surface

### 1 Scope

This part of ISO 4039 specifies the essential dimensions and material requirements for metallic and thermoplastic pipes, male fittings and tapped holes with a conical sealing surface, of the metric series, used in pneumatic braking systems on road vehicles using compressed air at a pressure below 2 MPa (20 bar).

Annex A gives, for information, an indication as to the relationship between this part of ISO 4039 and ISO 6149, and a recommendation on how to indicate conformity with this part of ISO 4039.

### 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 4039. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4039 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9227:1990, *Corrosion tests in artificial atmospheres - Salt spray tests*.

### 3 Pipes

#### 3.1 Dimensions

The external diameter,  $D_1$ , shall be as specified in table 1. It may be used in any combination with the threads specified in table 2.

**Table 1 - Dimensions of pipes**

Dimensions in millimetres

External diameter, $D_1$	6	8	10	12	14	15	16	18	20
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#### 3.2 Materials

Pipes may be made of metal (examples: steel, copper, copper alloys, etc.) or thermoplastics (example: polyamide, etc.).

#### 3.3 Surface condition

The inner and outer surfaces of the pipes shall be free from oxidation, and shall be smooth and clean.

The outer surface shall be protected against corrosion. Sensitivity to corrosion shall be evaluated in accordance with one of the methods specified in ISO 9227, to be agreed between the interested parties, but with a minimum exposure to salt spray of 200 h.

## **4 Tapped holes and male fittings**

### **4.1 Tapped hole dimensions with conical sealing surface**

Tapped holes with a conical sealing surface shall conform to figure 1 and to the dimensions given in table 2.

### **4.2 Dimensions of male fittings**

Male fittings shall conform to figure 2 and to the dimensions given in table 3.

### **4.3 Surface condition**

The requirements of 3.3 apply.

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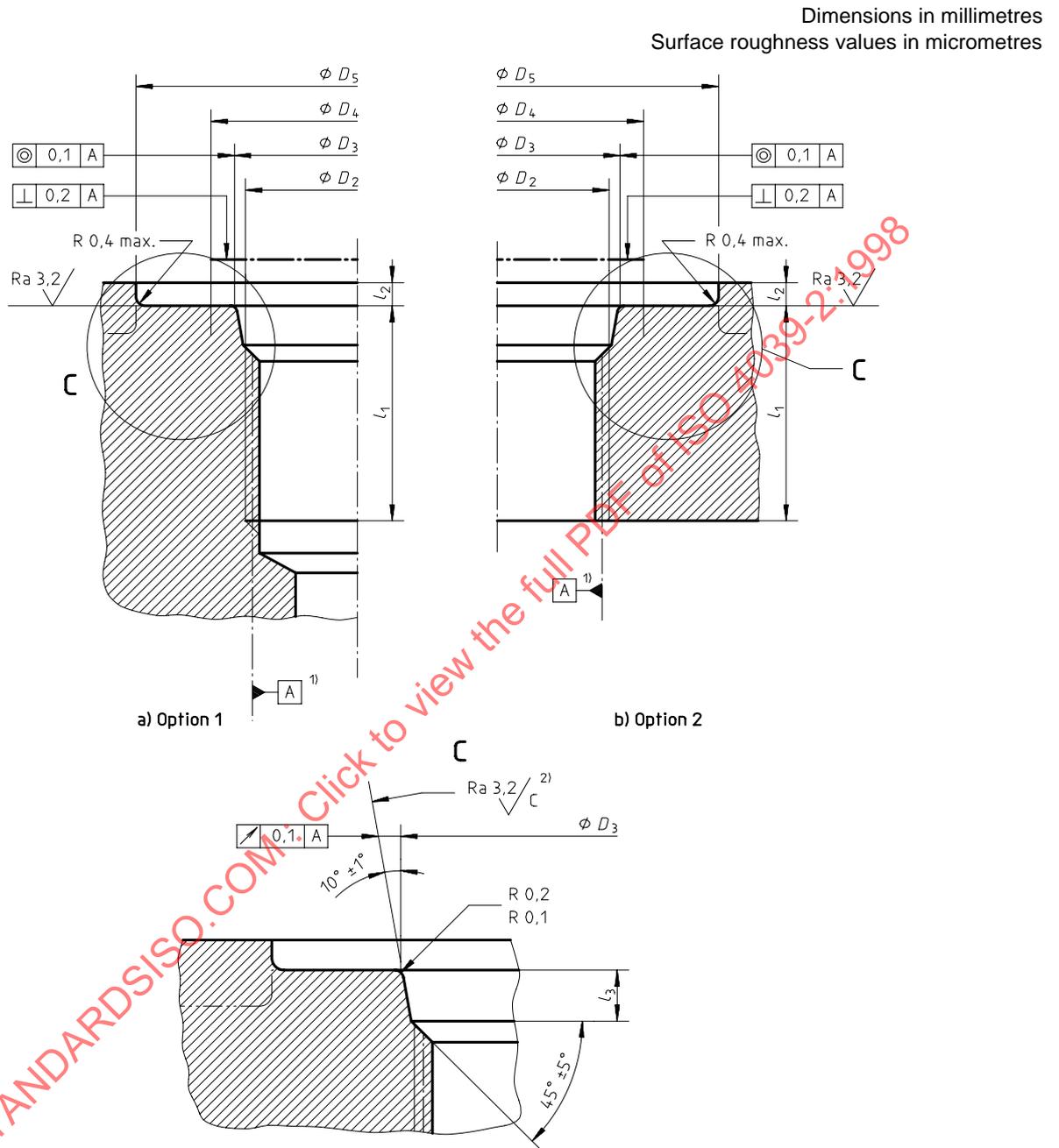


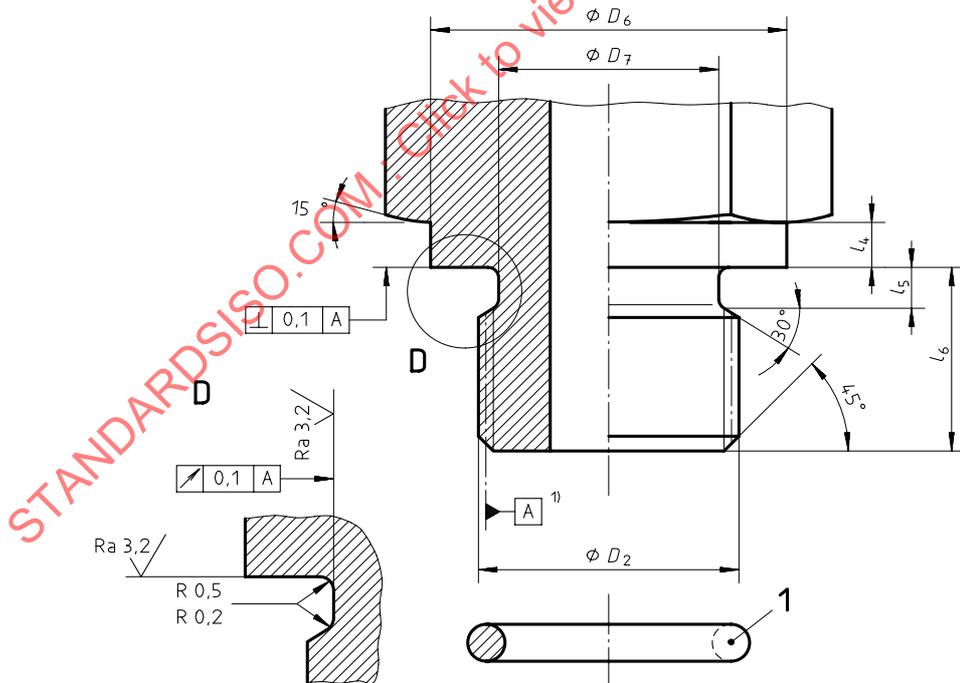
Figure 1 — Connection port

**Table 2 — Connection port dimensions**

Dimensions in millimetres

$D_2$	$D_3$	$D_4$	$D_5$ 1) 2)	$l_1$ 3)	$l_2$ 1) 4)	$l_3$
6H	+0,4 -0,1		min.	min.	max.	+0,4 0
M10 × 1	10,5	13	20	9	1	1,6
M12 × 1,5	13	16	22	11,5	1,5	2,4
M14 × 1,5	15	18	24			
M16 × 1,5	17	20	26			
M22 × 1,5	23	26	33			

- 1) If the face of the boss is on a machined surface, dimensions  $D_5$  and  $l_2$  do not apply.
- 2) Recommended diameter of the sealing face or equivalent flat surface.
- 3) Minimum full thread length.
- 4) Maximum recommended depth of the centring face to allow sufficient engagement of the wrench to ensure appropriate tightness of fittings and lock-nuts.



- 1 O-ring
- 1) Pitch diameter.

**Figure 2 — Male fitting**

Table 3 — Male fitting dimensions

Dimensions in millimetres

$D_2$	$D_6$ <sup>1)</sup>		$D_7$	$l_4$ <sup>1)</sup>	$l_5$	$l_6$	<b>O-ring</b> <sup>2)</sup> (inner diameter × cross-sectional diameter)
	min.	max.					
6g			$-0,1$	min.	$+0,3$ $0$	$-0,4$	
M10 × 1	13,2	19,6	8,55	1,5	1,5	8	8 × 1,25
M12 × 1,5	16	21,9	9,85	2	2,3	10	9,4 × 2,1
M14 × 1,5	18	23,9	11,85				11,4 × 2,1
M16 × 1,5	21	25,3	13,85				13,4 × 1,9
M22 × 1,5	26	31,1	19,85	2,5			19 × 2

1) Optional collar when pitch diameter of the fitting is less than  $D_6$ .

2) Unless otherwise specified O-rings shall have a minimum hardness of 70 IRHD.

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## Annex A (informative)

### Relationship to ISO 6149 and recommendation

#### A.1 Relationship to ISO 6149

The requirements of this part of ISO 4039 are based on those of ISO 6149 (see annex B) with regard to the cone angle of the tapped holes and the O-ring grooves. The requirements are nevertheless more stringent to provide for better sealing capacity: this is required in braking systems. These requirements have already been introduced into series production on road vehicles in several countries.

#### A.2 Identification statement (reference to this part of ISO 4039)

It is recommended that manufacturers who elect to conform to this part of ISO 4039 should use the following identification statement in their test reports, catalogues and sales literature:

"Tapped holes with a conical sealing surface conforming to ISO 4039-2:1998, *Road vehicles — Pneumatic braking systems — Part 2: Pipes, male fittings and tapped holes with conical sealing surface.*"