

INTERNATIONAL STANDARD

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Road vehicles — Hydraulic braking systems — Simple flare pipes, tapped holes, male fittings and hose end fittings

*Véhicules routiers — Dispositifs de freinage hydraulique — Tuyauteries à
simple renflement, logements, raccords mâles et embouts de flexibles*

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Reference number
ISO 4038:1996(E)

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 4038 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 2, *Brake systems and equipment*.

This third edition cancels and replaces the second edition (ISO 4038:1984), which has been technically revised.

Annex A of this International Standard is for information only.

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Road vehicles — Hydraulic braking systems — Simple flare pipes, tapped holes, male fittings and hose end fittings

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1 Scope

This International Standard specifies the essential dimensions and physical characteristics for metallic pipes, pipes with single flares, tapped holes, male fittings, and hose end fittings used in hydraulic braking systems for road vehicles.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard 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

Pipes shall be made from double-walled rolled pipe of dimensions conforming to table 1.

Pipes may be flanged at both ends with male fittings (see figure 1). Flanges shall be as shown in figure 2 and table 2.

Pipes with additional plastic coating may be used; however, these pipes shall be compatible with male fittings, tapped holes, and flares as specified in this International Standard.

Steel tubes shall have the following mechanical characteristics:

- tensile strength¹⁾:
yield point:
elongation at break¹⁾
hardness:
- ≥ 290 MPa
≥ 200 MPa
≥ 25 %
≤ 55 HR30T

The inner and outer surfaces of the tube shall be free from oxidation. The outer surface shall be protected against corrosion and shall withstand the NSS salt spray test in accordance with ISO 9227 for at least 96 h.

Table 1 — Dimensions of pipes

		Dimensions in millimetres			
Outside diameter of bare pipe ¹⁾	D	nom.	4,75	6	8
		tol.	± 0,07	± 0,07	± 0,07
Wall thickness	e_1	nom.	0,7	0,7	0,7
		tol.	± 0,07	± 0,07	± 0,07
Outside diameter, with surface protection	D_1	max.	4,97	6,22	8,22
Minimum burst pressure		MPa ²⁾	110	85	67,5
Average mass per metre		kg/m	0,07	0,09	0,12
NOTE — The circumferential tolerance of the pipes shall be contained within the outside diameter tolerance.					
1) Bare pipe means a pipe without surface treatment. Pipes which have been manufactured from surface-treated sheet material are considered to be bare pipes.					
2) 1 MPa = 10 bar					

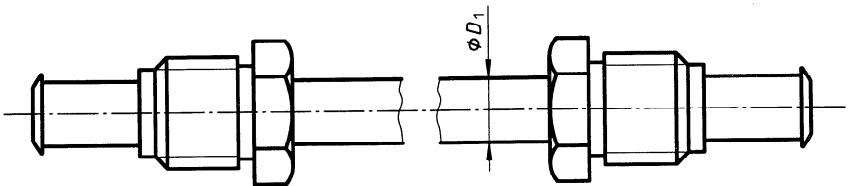


Figure 1 — Pipe flanged at both ends with male fittings

1) For pipes which are to be bent.

Dimensions in millimetres
Roughness values in micrometres

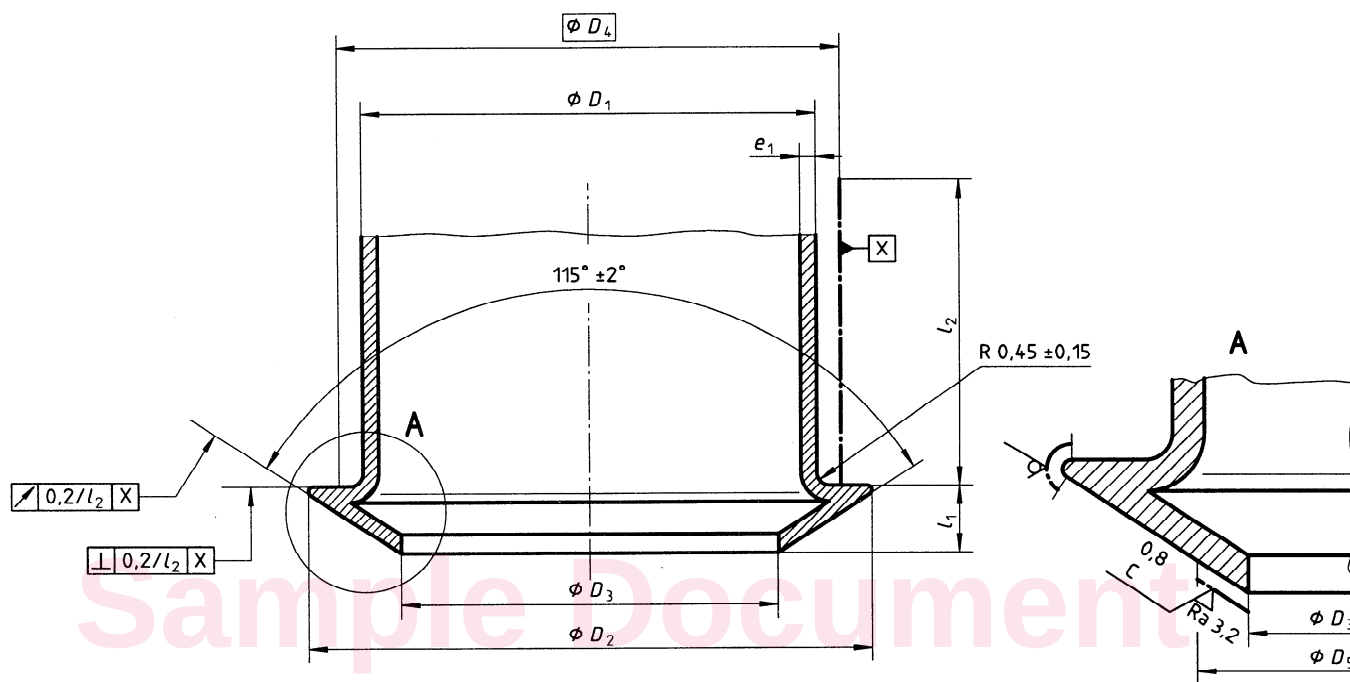


Figure 2 — Single flare

Table 2 — Dimensions of single flares

Dimensions in millimetres

Tube diameter D nom.	D_1 max.	D_2 js14	D_3 $+0,3$ $-0,2$	D_4 ref.	D_5 min.	l_1 $\pm 0,3$	l_2 min.
4,75	4,97	7,1	3,2	6	5,5	2,5	17
6	6,22	8,4	4,5	7,3	6,8	2,5	18
8	8,22	10,7	6,5	9,3	8,8	2,7	24
10	10,22	12,7	8,5	11,3	10,8	3	28

4 Tapped holes for cone sealing

Dimensions of tapped holes for cone sealing shall be as shown in figure 3 and table 3. At the discretion of the manufacturer, the hole entry may be as shown in figure 4.