INTERNATIONAL STANDARD

ISO 6182-12

Second edition
2014-12-15

Fire protection — Automatic sprinkler systems —

Part 12: Requirements and test methods for grooved-end components for steel pipe systems

Protection contre l'incendie — Systèmes d'extinction automatiques du type sprinkler —

Partie 12: Exigences et méthodes d'essai pour les raccords de tuyauterie en acier à extrémités rainurées

Reference number
ISO 6182-12:2014(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web 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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 21, *Equipment for fire protection and firefighting*, Subcommittee SC 5, *Fixed firefighting systems using water*.

This second edition cancels and replaces the first edition (ISO 6182-12:2010), which has been technically revised.

ISO 6182 consists of the following parts, under the general title *Fire protection — Automatic sprinkler systems*:

— *Part 1: Requirements and test methods for sprinklers*

— *Part 2: Requirements and test methods for wet alarm valves, retard chambers and water motor alarms*

— *Part 3: Requirements and test methods for dry pipe valves*

— *Part 4: Requirements and test methods for quick-opening devices*

— *Part 5: Requirements and test methods for deluge valves*

— *Part 6: Requirements and test methods for check valves*

— *Part 7: Requirements and test methods for early suppression fast response (ESFR) sprinklers*

— *Part 8: Requirements and test methods for pre-action dry alarm valves*

— *Part 9: Requirements and test methods for water mist nozzles*

— *Part 10: Requirements and test methods for domestic sprinklers*

— *Part 11: Requirements and test methods for pipe hangers*

— *Part 12: Requirements and test methods for grooved-end components for steel pipe systems*

Introduction

This part of ISO 6182 is one of a number of International Standards prepared by ISO/TC 21 covering components for automatic sprinkler systems.

They are included in a series of International Standards planned to cover the following:

a) carbon dioxide systems (ISO 6183);

b) explosion protection systems (ISO 6184).

Fire protection — Automatic sprinkler systems —

Part 12: Requirements and test methods for grooved-end components for steel pipe systems

1 Scope

This part of ISO 6182 specifies performance requirements, grooving dimensions, test methods, and marking requirements for couplings used in the joining of roll and cut grooved steel tube, pipe, grooved-end fittings, and other grooved-end components up to 300 mm in nominal diameter.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 898-2, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 2: Nuts with specified property classes — Coarse thread and fine pitch thread*

ISO 1083, *Spheroidal graphite cast irons — Classification*

ISO 4200:1991, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length*

ASTM A47/A47M-99(2004), *Standard Specification for Ferritic Malleable Iron Castings*

ASTM A153/A153M, *Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*

ASTM A183, *Standard Specification for Carbon Steel Track Bolts and Nuts*

ASTM A536-84(2004), *Standard Specification for Ductile Iron Castings*

ASTM A563-07a, *Standard Specification for Carbons and Alloy Steel Nuts*

ASTM B633-07, *Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel*

ASTM D395-03, *Standard Test Methods for Rubber Property — Compression Set*

EN 12329, *Corrosion protection of metals — Electrodeposited coatings of zinc with supplementary treatment on iron or steel*

VdS 2100-6:2002-5(01), *Guidelines for water extinguishing systems — Pipe joints — Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
grooved-end components
pipe, tubes, fittings, and other components that are used to form grooved mechanical coupling joints

3.2
mechanical coupling
device consisting of two or more housings, fasteners such as bolts and nuts and a pressure-responsive gasket, used to mechanically join grooved pipe, tubing, valves, fittings, and other grooved-end components to form a sealed joint

3.2.1
flexible mechanical coupling
mechanical coupling forming a sealed joint in which there is limited angular, axial, and rotational movement without overstressing the pipe joint

Note 1 to entry: See 6.8.

3.2.2
rigid mechanical coupling
mechanical coupling forming a sealed joint in which there is essentially no free angular, axial, or rotational movement

3.3
mechanical coupling housing
structural parts of a mechanical coupling that mechanically fit onto grooved pipes, tubes, fittings, and other grooved-end components to provide restraint and enclosure of the gasket

3.4
OD
outside diameter

3.5
pressure-responsive gasket
gasket that improves its seal with the application of pressure; that is, additional pressure results in additional force between the gasket and the surface to which it is sealing

3.6
rated working pressure
maximum service pressure at which a grooved piping system is intended to operate

4 Product consistency

It shall be the responsibility of the manufacturer to implement a quality-control programme to ensure that production consistency meets the requirements of this part of ISO 6182 in the same manner as the originally tested samples.

5 Product assembly

Installation instructions shall be provided by the manufacturer and shall include at least the following:

a) assembly procedure for the installation of couplings;

b) grooved-end component specifications, with which the coupling is intended to be used, including minimum pipe wall thickness;

c) bolt torque specification, where required by the manufacturer;

d) maximum allowable movement for flexible couplings;

e) specification for permissible media within the pipe in conjunction with the gasket material (see 8.2 for colour codes).

6 Requirements

6.1 Standard grooved-end dimensions

NOTE This clause gives standard dimensions for grooved ends that the coupling manufacturer may refer to if he does not need to specify special dimensions for the grooved ends compatible to his coupling. Couplings for grooved ends of special dimensions may be subjected to special tests to determine their suitability.

6.1.1 Roll grooved-end dimensions

The standard dimensions of roll grooved ends shall be in accordance with Table 1. See also Figure 1.

6.1.2 Cut grooved-end dimensions

The standard dimensions of cut grooved ends shall be in accordance with Table 2. See also Figure 2.

6.1.3 Cast grooved-end dimensions

The standard dimensions of cast grooved ends shall be in accordance with Table 3.

6.2 Minimum pipe wall thickness

6.2.1 Grooved-end pipe couplings tested in accordance with 7.7.1 shall be tested with pipe according to ISO 4200:1991, Table 1; range D. Pipe with higher wall thickness may be used, if this corresponds to the minimum wall thickness specified by the manufacturer.

6.2.2 Grooved-end pipe couplings tested in accordance with 7.7.2 shall be tested with pipe having the minimum nominal wall thickness specified in the manufacturer's installation instructions.

6.3 Mechanical coupling housing

The casting materials of the housings shall be ductile iron in accordance with ISO 1083, Grade 400-15; ASTM A536-84(2004), Grade 65-45-12 or malleable iron in accordance with ASTM A47/A47M-99(2004), Grade 32510 or 32518; or material having equivalent strength and corrosion resistance. When requested on purchase order, the housing shall be galvanized in accordance with ASTM A153/A153M or EN 12329.

6.4 Pressure-responsive gasket

Materials for the coupling gaskets shall be ethylene-propylene diene m-class-rubber (EPDM), nitrile, silicone rubber, or other elastomeric materials suitable for the intended service.

6.5 Bolts

Oval neck track head bolts shall be in accordance with ISO 898-1, Class 8.8, heavy hex bolts in accordance with ASTM A183 or other bolts which prevent rotation and have a minimum tensile strength of 800 N/mm^2. Bolts shall be zinc plated in accordance with ASTM B633-07, SC1 or EN 12329, or be of a material that provides at least equivalent corrosion resistance.

Table 1 — Roll grooved-end dimensional specifications

Dimensions in millimetres

Pipe or tube (OD) tolerance			Dimensional specifications						
Size	Outside diameter		Gasket seat A +/-0,76	Groove width B +/-0,76	Grooved diameter C		Groove depth D[a]	Min. allow. wall thickness T	Max. flare F Dia.
	Actual	Tolerance			Actual	Tolerance			
25	33,7	+0,41 -0,68	15,88	7,14	30,23	-0,38	1,60	1,8	36,3
32	42,4	+0,50 -0,60	15,88	7,14	38,99	-0,38	1,60	1,8	45,0
40	48,3	+0,44 -0,52	15,88	7,14	45,09	-0,38	1,60	1,8	51,1
50	60,3	-0,61	15,88	8,74	57,15	-0,38	1,60	1,8	63,0
65	73,0	-0,74	15,88	8,74	69,09	-0,46	1,98	2,3	75,7
65	76,1	-0,76	15,88	8,74	72,26	-0,46	1,98	2,3	78,7
80	88,9	+0,89 -0,79	15,88	8,74	84,94	-0,46	1,98	2,3	91,4
90	101,6	+1,02 -0,79	15,88	8,74	97,38	-0,51	2,11	2,3	104,1
100	108,0	+1,07 -0,79	15,88	8,74	103,73	-0,51	2,11	2,3	110,5
100	114,3	+1,14 -0,79	15,88	8,74	110,08	-0,51	2,11	2,3	116,8
125	133,9	+1,32 -0,79	15,88	8,74	129,13	-0,51	2,11	2,9	135,9
125	139,7	+1,40 -0,79	15,88	8,74	135,48	-0,51	2,11	2,9	142,2
125	141,3	+1,42 -0,79	15,88	8,74	137,03	-0,56	2,13	2,9	143,8
150	159,0	+1,60 -0,79	15,88	8,74	154,5	-0,56	2,16	2,9	161,3
150	165,1	+1,60 -0,79	15,88	8,74	160,90	-0,56	2,16	2,9	167,6
150	168,3	+1,60 -0,79	15,88	8,74	163,96	-0,56	2,16	2,9	170,9
200	219,1	+1,60 -0,79	19,05	11,91	214,40	-0,64	2,34	2,9	223,5
250	273,0	+1,60 -0,79	19,05	11,91	268,28	-0,69	2,39	3,6	277,4
300	323,9	+1,60 -0,79	19,05	11,91	318,29	-0,76	2,77	4,0	328,2

[a] Dimension for reference only, groove diameter is determined by C.

Table 2 — Cut grooved-end dimensional specifications

Dimensions in millimetres

Pipe or tube			Dimensional specifications					
Nominal size	(OD) Outside diameter		Gasket seat A +/-0,76	Groove width B +/-0,76	Grooved diameter C		Groove depth D[a]	Min. allow. wall thickness T
	Actual	Tolerance			Actual	Tolerance		
25	33,7	+0,41 -0,68	15,88	7,54	30,23	-0,38	1,60	3,4
32	42,4	+0,50 -0,60	15,88	7,54	38,99	-0,38	1,60	3,6
40	48,3	+0,44 -0,52	15,88	7,54	45,09	-0,38	1,60	3,7
50	60,3	+0,61	15,88	8,36	57,15	-0,38	1,60	3,9
65	73,0	+0,74	15,88	8,36	69,09	-0,46	1,98	4,8
65	76,1	+0,76	15,88	8,36	72,26	-0,46	1,98	4,8
80	88,9	+0,89 -0,79	15,88	8,36	84,94	-0,46	1,98	4,8
90	101,6	+1,02 -0,79	15,88	8,36	97,38	-0,51	2,11	4,8
100	108,0	+1,07 -0,79	15,88	9,14	103,73	-0,51	2,11	5,2
100	114,3	+1,14 -0,79	15,88	9,14	110,08	-0,51	2,11	5,2
125	133,0	+1,32 -0,79	15,88	9,14	129,13	-0,51	2,11	5,2
125	139,7	+1,40 -0,79	15,88	9,14	135,48	-0,51	2,11	5,2
125	141,3	+1,42 -0,79	15,88	9,14	137,03	-0,56	2,13	5,2
150	159,0	+1,60 -0,79	15,88	9,14	154,5	-0,56	2,16	5,6
150	165,1	+1,60 -0,79	15,88	9,14	160,90	-0,56	2,16	5,6
150	168,3	+1,60 -0,79	15,88	9,14	163,96	-0,56	2,16	5,6
200	219,1	+1,60 -0,79	19,05	11,53	214,40	-0,64	2,34	6,1
250	273,0	+1,60 -0,79	19,05	12,32	268,28	-0,69	2,39	6,4
300	323,9	+1,60 -0,79	19,05	12,32	318,29	-0,76	2,77	7,1

[a] Dimension for reference only, groove diameter is determined by C.

Dimension in millimetres

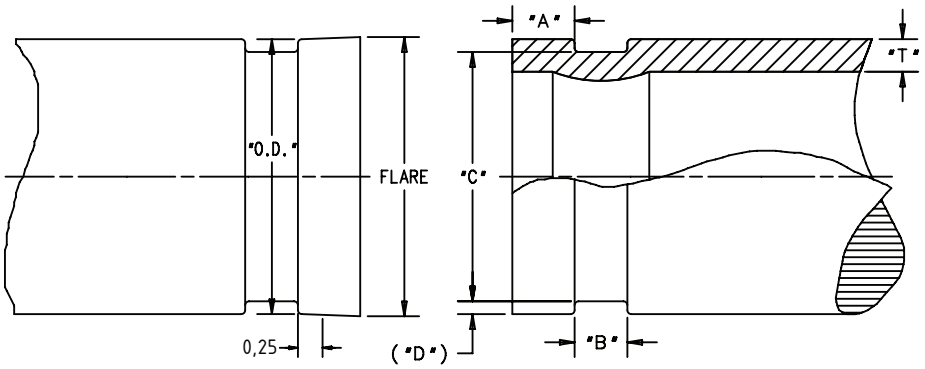


Figure 1 — Roll grooved-end dimensional reference points from Table 1

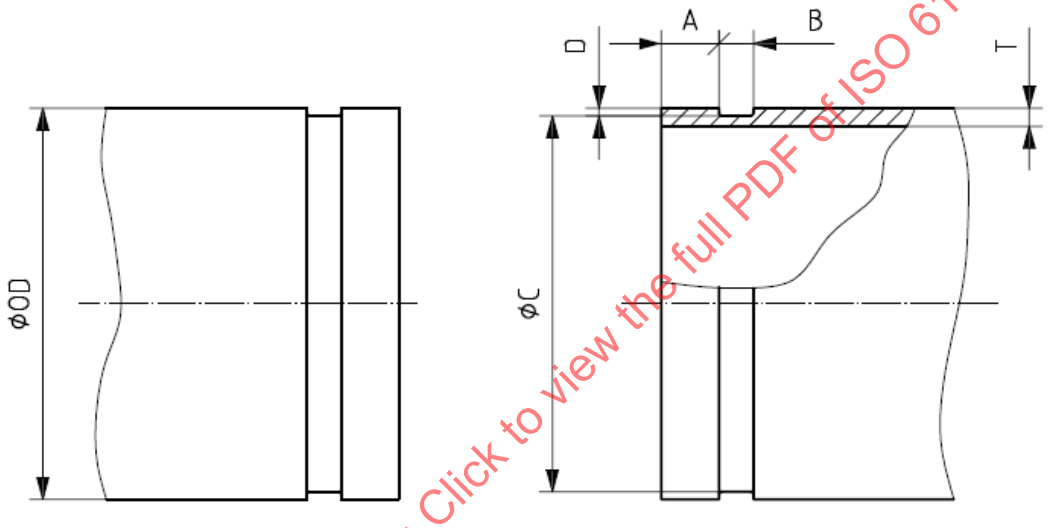


Figure 2 — Cut grooved-end dimensional reference points from Table 2

Table 3 — Cast components grooved-end dimensions

Dimensions in millimetres

Nominal diameter DN	Outside diameter OD	Tolerance	Groove diameter	Tolerance	Gasket seat	Tolerance	Groove width	Tolerance
25	33,4	+0,37 -0,37	30,2	0 –0,89	15,88	+0,76 -0,76	7,54	+1,17 -1,17
32	42,2	+0,37 -0,37	39,0	0 –0,89	15,88	+0,76 -0,76	7,54	+1,17 -1,17
40	48,3	+0,34 -0,34	45,1	0 –0,89	15,88	+0,76 -0,76	7,54	+1,17 -1,17
50	60,3	+0,40 -0,40	57,2	0 –0,89	15,88	+0,76 -0,76	8,36	+1,17 -1,17
65	73,0	+0,49 -0,49	69,1	0 –0,97	15,88	+0,76 -0,76	8,36	+1,17 -1,17

Table 3 *(continued)*

Nominal diameter DN	Outside diameter OD	Tolerance	Groove diameter	Tolerance	Gasket seat	Tolerance	Groove width	Tolerance
65	76,1	+0,50 -0,50	72,3	0 –0,97	15,88	+0,76 -0,76	8,36	+1,17 -1,17
80	88,9	+0,54 -0,54	84,9	0 –0,97	15,88	+0,76 -0,76	8,36	+1,17 -1,17
90	101,6	+0,58 -0,58	97,4	0 –1,07	15,88	+0,76 -0,76	8,36	+1,17 -1,17
100	108,0	+0,59 -0,59	103,7	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
100	114,3	+0,61 -0,61	110,1	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
125	133,0	+0,66 -0,66	129,1	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
125	139,7	+0,68 -0,68	135,5	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
125	141,3	+0,69 -0,69	137,0	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
150	159,0	+0,74 -0,74	154,5	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
150	165,1	+0,74 -0,74	160,8	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
150	168,3	+0,74 -0,74	164,4	0 –1,07	15,88	+0,76 -0,76	9,14	+1,17 -1,17
200	219,1	+0,76 -0,76	214,4	0 –1,52	19,05	+0,76 -0,76	11,53	+1,17 -1,17
250	273,0	+0,77 -0,77	268,3	0 –1,57	19,05	+0,76 -0,76	12,32	+1,17 -1,17
300	323,9	+0,79 -0,79	318,3	0 –1,65	19,05	+0,76 -0,76	12,32	+1,17 -1,17

6.6 Nuts

Nuts shall be hexagon nuts in accordance with ISO 898-2, minimum Class 8, or heavy (large) hexagon nuts in accordance with ASTM A563-07a, Grade B or equivalent. Nuts shall be zinc plated in accordance with ASTM B633-07, SC1, or be of a material that provides at least the equivalent corrosion resistance.

6.7 Hinge pins

Hinge pins, if provided, shall be zinc plated in accordance with ASTM B633-07, Class FE/ZN5, or EN 12329, or be of a material that provides at least the equivalent corrosion resistance.

6.8 Flexible coupling

A flexible mechanical coupling shall permit axial displacement, rotation, and at least 1° of angular movement for pipe diameter sizes less than 200 mm and 0,5° for pipe diameter sizes 200 mm and greater without inducing harm on the pipe when tested in accordance with 7.7.

6.9 Vacuum (see 7.2)

The coupling assembly shall maintain a vacuum of 0,08 MPa (0,8 bar) for a period of 5 min without leakage when tested in accordance with 7.2.

6.10 Air leakage (see 7.3)

The coupling assembly shall show no evidence of air leakage when tested in accordance with 7.3.

6.11 Low-temperature exposure (see 7.4)

The coupling assembly shall show no evidence of air leakage when tested in accordance with 7.4.

6.12 Heat ageing (see 7.5)

The coupling assembly shall show no evidence of air leakage or cracking of the gasket when tested in accordance with 7.5.

6.13 Hydrostatic pressure (see 7.6)

The coupling assembly shall show no evidence of leakage, fracture, or rupture when tested in accordance with 7.6.

6.14 Bending moment (see 7.7)

The coupling assembly shall show no evidence of fracture, rupture, or evidence of water leakage when tested in accordance with 7.7.1 or 7.7.2.

6.15 Gasket material evaluation

6.15.1 Compression set

Compression set shall not exceed 25 % when tested in accordance with ASTM D395-03, method B.

6.15.2 Tensile strength and elongation

6.15.2.1 General

Gasket materials shall have the following properties when tested in accordance with ISO 37:

a) for silicone rubber (having poly-organo-siloxan as its constituent characteristics), a minimum tensile strength of 3,4 MPa (34 bar) and a minimum ultimate elongation of 100 %;

b) for natural rubber and a synthetic rubber other than silicone rubber, a minimum tensile strength of 10,3 MPa (103 bar) and a minimum ultimate elongation of 150 %, or a minimum tensile strength of 15,2 MPa (152 bar) and a minimum ultimate elongation of 100 %.

6.15.2.2 When tested in accordance with ISO 188, the physical properties of the gasket material after oven ageing at 100 °C for 70 h shall be at least 60 % of the as-received tensile strength and elongation values. Any change in the hardness shall not exceed 5 % of the as-received value.

6.16 Fire resistance (see 7.8)

The design of the coupling system should be such that a joint shall not leak in excess of single drops, i.e. not in the form of flowing water or water spray, after a fire test in accordance with 7.8.

NOTE In some countries, this test is not mandatory.

6.17 Rated working pressure

The rated working pressure of a coupling shall not be less than 1,2 MPa (12 bar).

6.18 Nominal sizes

The size of a coupling shall be in accordance with the pipe sizes given in ISO 4200:1991.

7 Test methods

7.1 Test assembly

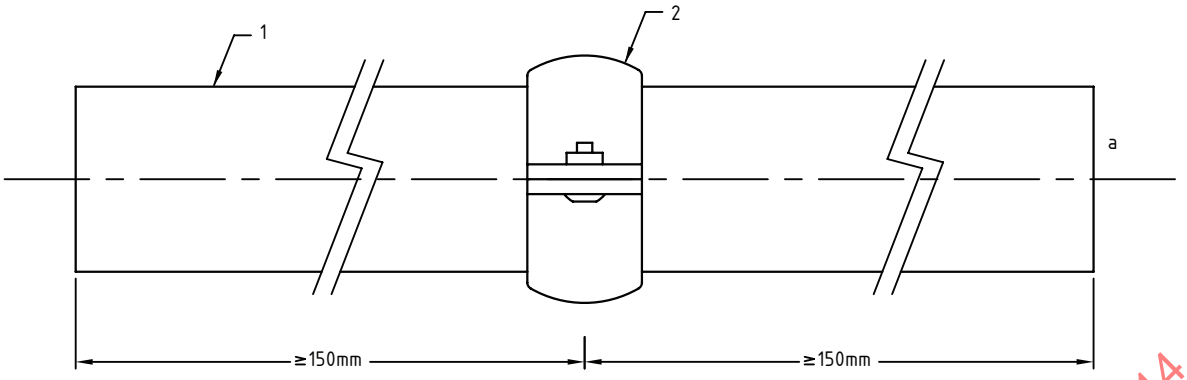
Unless otherwise specified, the test assembly shall consist of two sections of piping, each 150 mm long and fitted with end caps. The test coupling shall be assembled in accordance with the manufacturer's installation instructions. See Figure 3.

7.2 Vacuum (see 6.9)

7.2.1 The test assembly (see Figure 3) shall be equipped with a vacuum gauge to permit visual verification of the actual vacuum being applied. Vacuum tests shall be performed at an ambient temperature of (24 ± 5) °C.

7.2.2 Using a suitable vacuum pump, the test assembly shall be subjected to an internal vacuum pressure of 0,08 MPa (0,8 bar), and then isolated by closing shut off valves located between the test sample and the vacuum pump. The 0,08 MPa (0,8 bar) vacuum pressure may be re-established, if necessary, following an appropriate stabilization period.

7.2.3 Once the vacuum pressure has been established, there shall be no increase of more than 0,01 MPa (0,1 bar) below relative ambient pressure during the 5 min test period.



Key

1 pipe section

2 pipe fitting

a Pipe tap provided in the end.

Figure 3 — Test assembly

7.3 Air leakage (see 6.10)

7.3.1 The test assembly (see Figure 3) shall be equipped with pressure measuring equipment to permit visual verification of the internal pressure being applied. Air tests shall be performed at an ambient temperature of (24 ± 5) °C.

7.3.2 The air pressure shall then be increased to 0,3 MPa (3 bar) and held for 5 min before soapy water or leakage test fluid application.

CAUTION — Pneumatic pressure testing requires appropriate safety precautions.

7.3.3 There shall be no loss of air pressure observed by pressure measuring equipment or evidence of leakage during a 5 min test period.

7.4 Low-temperature exposure (see 6.11)

7.4.1 The test assembly (see Figure 3) shall be equipped with a pressure gauge to permit visual verification of the pressure being applied.

7.4.2 Water with a depth of 3 mm shall be added to the horizontal assembly. The assembly and water shall be at an ambient temperature of (24 ± 5) °C. The assembly shall then be pressurized with air up to 0,3 MPa (3 bar), sealed and placed in a chamber at −40 °C in the horizontal position for a period of 24 h. Following the exposure, the assembly shall be restored to ambient temperature.

CAUTION — Pneumatic pressure testing requires appropriate safety precautions.

7.4.3 The air pressure in the assembly shall be observed to return to 0,3 MPa (3 bar) within 24 h.

7.5 Heat aging (see 6.12)

7.5.1 The test assembly (see Figure 3) shall be initially pressurized to 0,3 MPa (3 bar) to check for leakage as specified in 7.3.2, then depressurized and placed in the oven at 135 °C for 45 d.

CAUTION — Pneumatic pressure testing requires appropriate safety precautions.

7.5.2 Following exposure, the assembly shall be conditioned at an ambient temperature of (24 ± 5) °C for a minimum of 24 h. The test assembly shall then be submerged in water and pressurized with air to 0,3 MPa (3 bar) for 5 min.

CAUTION — Pneumatic pressure testing requires appropriate safety precautions.

7.5.3 There shall be no loss of air pressure observed by the formation of air bubbles at the test coupling during the 5 min test period.

7.5.4 The test assembly shall be disassembled and the gasket shall not crack when two diametrically opposite points are squeezed together by hand until they touch. Gaskets intended for use with components 200 mm and larger shall also not crack when opposite sides are twisted by hand into a half turn.

7.6 Hydrostatic pressure test (see 6.13)

7.6.1 The test assembly (see Figure 3) shall be filled with water and purged of any entrapped air.

Hydrostatic tests shall be performed at an ambient temperature of (24 ± 5) °C.

CAUTION — Hydrostatic pressure testing requires appropriate safety precautions.

7.6.2 Hydrostatic pressure shall be increased at a rate not exceeding 2,0 MPa/min (20 bar/min) until an internal pressure level equal to four times the rated working pressure is attained. This pressure shall be maintained for 5 min.

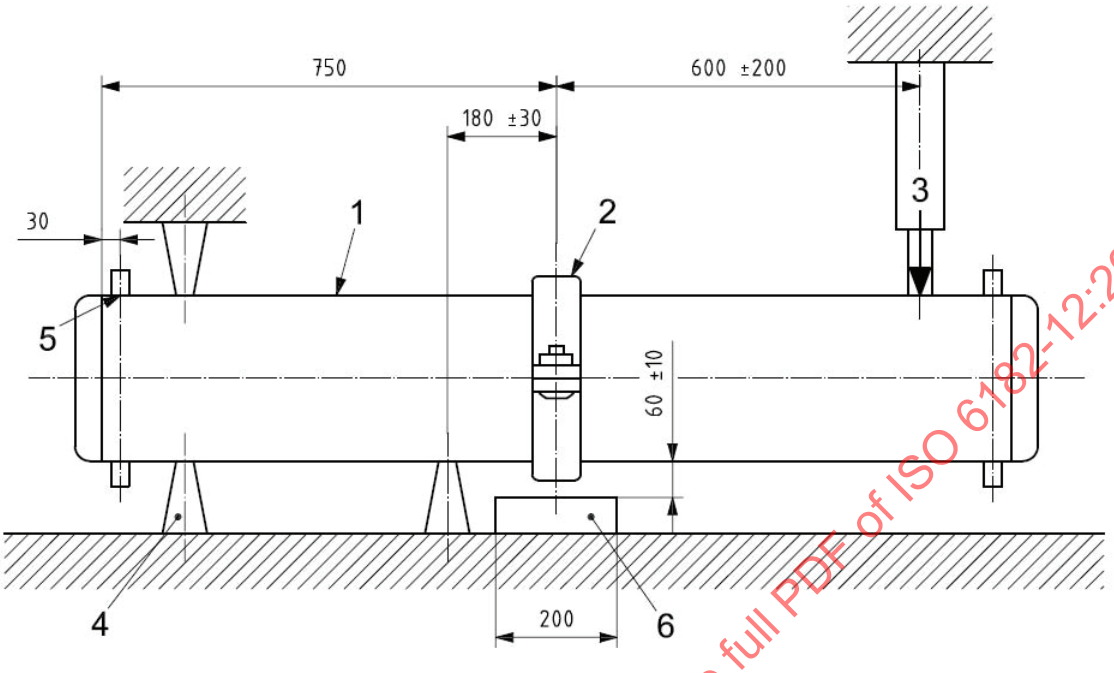
7.6.3 There shall be no leakage, rupture, or joint failure throughout the 5 min test period.

7.7 Bending moment (see 6.14)

7.7.1 Test method 1

7.7.1.1 The test assembly shall consist of two sections of piping, each a minimum of 750 mm long and fitted with end caps (see Figure 4). The test coupling shall be assembled in accordance with the manufacturer's installation instructions (see Figure 4).

Dimensions in millimetres



Key

1 pipe section
2 pipe fitting
3 test load
4 support
5 collar R 1,25 (1/2")
6 pan, 200 · 400 · 60, SS, thickness 2

Figure 4 — Test method 1 bending moment assembly

7.7.1.2 The bending moment test assembly shall be equipped with a pressure gauge to permit visual verification of the internal pressure being applied. Bending moment tests shall be performed at an ambient temperature of (24 ± 5) °C.

7.7.1.3 The test assembly shall be filled with water and purged of any entrapped air. Hydrostatic pressure shall be applied to the test assembly and maintained at four times the rated working pressure of the joint for the duration of the test.

CAUTION — Hydrostatic pressure testing requires appropriate safety precautions.

7.7.1.4 A bending moment in accordance with Table 4 shall be applied to the coupling joint and held for a minimum of 10 min.

During this period of time, the test force may decrease. However, as soon as the test force drops below 75 % of the force required for generating the bending moment according to Table 4, the test force is increased again to the required level for generating the bending moment according to Table 4.

7.7.1.5 There shall be no leakage, rupture, or joint failure throughout the test period.

7.7.1.6 If the intention is to consider the coupling as a flexible grooved-end coupling in conformance with 6.8, the required angular displacement shall be observed at a bending moment not exceeding 25 % of the values given in Table 4.

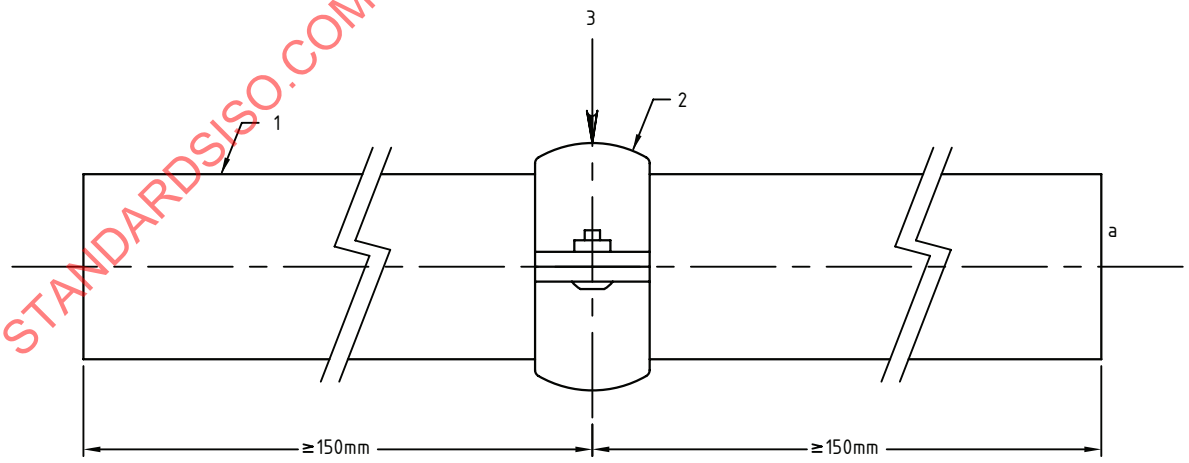
Table 4 — Test method 1 applied bending moments

Size of coupling mm	Applied bending moment N · m
25	350
32	644
40	858
50	1,000
65	1,280
80	1,950
100	2,940
125	6,130
150	8,830
200	19,080
250	31,800
300	52,560

For reducing couplings, the dimension of the smaller nominal diameter shall apply for the determination of the bending moment.

7.7.2 Test method 2

7.7.2.1 The test assembly shall consist of two sections of piping, each a minimum of 150 mm long and fitted with end caps (see Figure 5). The test coupling shall be assembled in accordance with the manufacturer's installation instructions (see Figure 5).



Key

1 pipe section
2 pipe fitting
3 test load
a Pipe tap provided in the end.

Figure 5 — Test method 2 bending moment assembly