INTERNATIONAL STANDARD

ISO 10931-4

First edition
1997-12-01

Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF) —

Part 4: Valves

Systèmes de canalisation en matières plastiques pour les applications industrielles — Poly(fluorure de vinylidène) (PVDF) —

Partie 4: Robinetterie

Reference number
ISO 10931-4:1997(E)

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.

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 10931-4 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 7, *Valves and auxiliary equipment of plastics materials*.

ISO 10931 consists of the following parts, under the general title *Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF)*:

— *Part 1: General*

— *Part 2: Pipes*

— *Part 3: Fittings*

— *Part 4: Valves*

— *Part 5: Fitness for purpose of the system*

— *Part 6: Recommended practice for installation*

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

Introduction

ISO 10931, which is divided into six parts (see Foreword), specifies the properties of pipes and piping system components made of poly(vinylidene fluoride) (PVDF) for industrial applications. It includes recommendations for installation (see ISO 10931-6) and is intended to be used by authorities, design engineers, testing and certification institutes and manufacturers. This part of ISO 10931 covers characteristics of valves.

Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF) —

Part 4:
Valves

1 Scope

This part of ISO 10931 specifies the characteristics of valves made from poly(vinylidene fluoride) (PVDF) for industrial applications, i.e. the conveyance of water and chemicals in the liquid or gaseous state. It also specifies the test parameters for the test methods referred to in this part of ISO 10931.

It is applicable to PVDF valves for the conveyance of fluids under pressure at temperatures up to 150 °C. However, applications above 120 °C, which depend on the crystalline melting point of the PVDF material, need to be verified with the valve supplier.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10931. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10931 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5752:1982, *Metal valves for use in flanged pipe systems — Face-to-face and centre-to-face dimensions.*

ISO 6708:1995, *Pipework components — Definition and selection of DN (nominal size).*

ISO 7005-1:1992, *Metallic flanges — Part 1: Steel flanges.*

ISO 7005-2:1988, *Metallic flanges — Part 2: Cast iron flanges.*

ISO 7005-3:1988, *Metallic flanges — Part 3: Copper alloy and composite flanges.*

ISO 7349:1983, *Thermoplastics valves — Connection references.*

ISO 7508:1985, *Unplasticized polyvinyl chloride (PVC-U) valves for pipes under pressure — Basic dimensions — Metric series.*

ISO 8233:1988, *Thermoplastics valves — Torque — Test method.*

ISO 8659:1989, *Thermoplastics valves — Fatigue strength — Test method.*

ISO 9393-1:1994, *Thermoplastics valves — Pressure test methods and requirements — Part 1: General.*

ISO 9393-2:1997, *Thermoplastics valves — Pressure test methods and requirements — Part 2: Test conditions and basic requirements for PE, PP, PVC-U and PVDF valves.*

ISO 10931-1:1997, *Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF) — Part 1: General.*

ISO 10931-2:1997, *Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF) — Part 2: Pipes.*

ISO 10931-3:1996, *Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF) — Part 3: Fittings.*

3 Definitions, symbols and abbreviations

For the purposes of this part of ISO 10931, the definitions, symbols and abbreviations given in ISO 10931-1 apply.

4 Valve body material specification

4.1 Material

The material from which the valve and the main ancillary components which are in contact with the conveyed fluid are made shall be a PVDF homopolymer of category 1, conforming to ISO 10931-1.

4.2 Use of reworked material

Clean reworked material produced during the manufacture and works testing of products conforming to this part of ISO 10931 may be used in limited amounts, provided it is derived from the same compound as used for the relevant production, and the final products conform to the applicable requirements of this part of ISO 10931.

4.3 Additional components

Additional components made from other plastics or non-plastics materials and necessary for the construction of PVDF valves shall have properties suitable for their specific functions and shall not prevent conformity with the performance requirements of this part of ISO 10931.

5 Appearance

When viewed without magnification, the internal and external surfaces of the PVDF valves and ancillaries shall appear smooth, clean and free from scoring, cavities, and other surface defects which would effect the function of the valve or prevent its conformity to this part of ISO 10931.

6 Geometrical characteristics

6.1 Design of valves and ancillaries

6.1.1 Nominal size

The nominal sizes of valves and ancillaries shall correspond to and be designated by the DN values specified in ISO 7349.

6.2 Valves

6.2.1 Types of valve

Valves covered by this part of ISO 10931 shall be categorized by the valve design, i.e. “ball”, “diaphragm” or “butterfly”, and by the type of connection, e.g. “fusion type” or “flange type”.

6.2.2 Joint dimensions

6.2.2.1 Sockets and spigots for fusion jointing

The valve socket and spigot dimensions shall be the same as for pipes and fittings conforming to ISO 10931-2 or ISO 10931-3, as applicable.

6.2.2.2 Mating dimensions for flange-type valves

The mating dimensions of the flanges used on valves shall conform to ISO 7005-1, ISO 7005-2 or ISO 7005-3, as applicable.

6.2.3 Laying lengths

Recommended laying lengths are given for valves with socket or spigot ends in manufacturers' catalogues.

6.2.3.1 Valves with plain socket ends

See figure 1 and table 1.

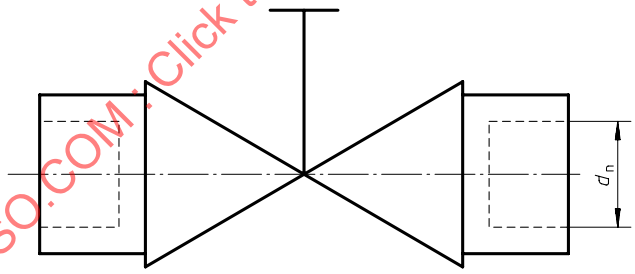

Figure 1 — Valve with plain socket ends

6.2.3.2 Valves with plain spigot ends

See figure 2 and table 1.

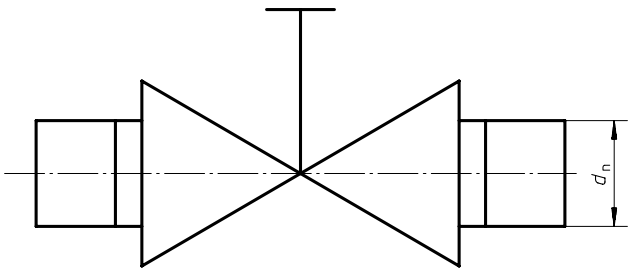

Figure 2 — Valve with plain spigot ends

6.2.3.3 Ball valves and diaphragm valves with flanged ends

See figure 3 and table 1.

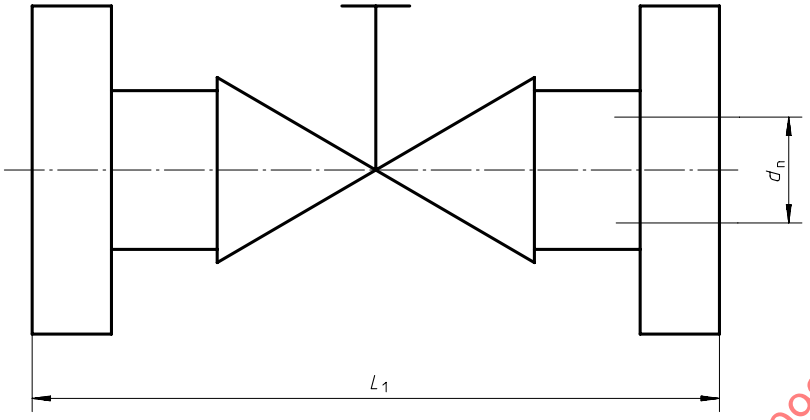

Figure 3 — Ball or diaphragm valve with flanged ends

Table 1 — Laying lengths of ball valves and diaphragm valves

Dimensions in millimetres

Nominal outside diameter of pipe d_n	Nominal size[1] DN	Face-to-face length[2), 3)] L_1	tolerance
116	110	120	± 2
120	115	130	
125	120	150	
132	125	160	
140	132	180	
150	140	200	
163	150	230	
175	165	290	± 3
190	180	310	
110	100	350	
125	100/125	400	
140	125	400	
160	150	480	

1) Conforming to ISO 7349.
2) Conforming to tables 6 and 7 of ISO 5752:1982 and table 1 of ISO 7508:1985.
3) The centre-to-face dimension of a three-way valve shall be $0{,}5L_1$.

6.2.3.4 Butterfly valves

See figures 4 and 5 and table 2.

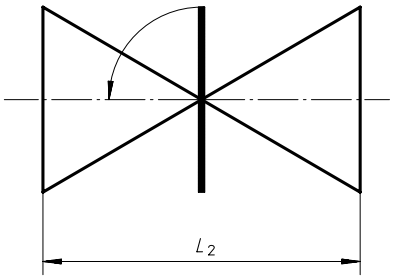

Figure 4 — Butterfly valve with flangeless (wafer) body

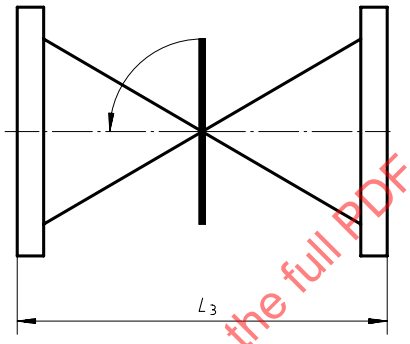

Figure 5 — Butterfly valve with double-flanged body

Table 2 — Laying lengths of butterfly valves

Dimensions in millimetres

Nominal outside diameter of pipe d_n	Nominal size[1] DN	Butterfly valves				Tolerance on L_2 and L_3
		Flangeless			Double-flanged	
		Face-to-face length				
		L_2[2]			L_3[3]	
		short	medium	long	short	
150	140	33	33	133	106	± 2
163	150	43	43	143	108	
175	165	46	46	146	112	
190	180	46	49	164	114	
110	100	52	56	164	127	
140	125	56	64	170	140	
160	150	56	70	176	140	
225	200	60	71	189	152	
280	250	68	76	114	165	
315	300	78	83	114	178	± 3

1) Conforming to ISO 6708.
2) Conforming to table 5 of ISO 5752:1982 (see also figure 4).
3) Conforming to table 4 of ISO 5752:1982 (see also figure 5).