

API Specification

**6D**

23<sup>rd</sup> Edition, April 2008  
Specification for Pipeline Valves

National Adoption of ISO 14313—Petroleum and natural gas industries—Pipeline transportation systems—Pipeline valves

**Annex A, Annex B, Annex C, and Annex D  
Purchasing Guidelines**

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API Monogram® Required  Yes  No

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## **Annex A (normative)**

### **Requirements for non-destructive examination**

#### **A.1 General**

This annex specifies the requirements for non-destructive examination (NDE) that shall be performed by the manufacturer if specified by the purchaser.

#### **A.2 Radiographic testing (RT) of castings on 100 % of critical areas**

Examination shall be carried out in accordance with ASME B16.34-2004, Appendix-I.

Acceptance shall be in accordance with ASME B16.34-2004, Appendix-I.

#### **A.3 Radiographic testing (RT) of castings on 100 % of accessible areas**

Examination shall be carried out in accordance with ASME B16.34-2004, Appendix-I.

Acceptance shall be in accordance with ASME B16.34-2004, Appendix-I.

#### **A.4 Ultrasonic testing (UT) of castings on 100 % of critical areas**

Examination shall be carried out in accordance with ASME B16.34-2004, Appendix-IV.

Acceptance shall be in accordance with ASME B16.34-2004, Appendix-IV.

#### **A.5 Ultrasonic testing (UT) of castings on 100 % of accessible areas**

Examination shall be carried out in accordance with ASME B16.34-2004, Appendix-IV.

Acceptance shall be in accordance with ASME B16.34-2004, Appendix-IV.

#### **A.6 Magnetic-particle testing (MT) of castings on 100 % of surface area**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 7.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 6, except that relevant indications (rounded and linear) of less than 5 mm are acceptable.

### **A.7 Penetrant testing (PT) of castings on 100 % of surface area**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8, except that relevant indications (rounded and linear) of less than 5 mm are acceptable.

### **A.8 Ultrasonic testing (UT) of forgings and plate on 100 % of surface area**

Examination shall be carried out in accordance with ASTM A388, ASTM A435 or ASTM A577, as applicable.

Acceptance shall be in accordance with ASTM A388, ASTM A435 or ASTM A577, as applicable.

### **A.9 Magnetic-particle testing (MT) of forgings on 100 % of surface area**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 7.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 Appendix 6.

### **A.10 Penetrant testing (PT) of forgings on 100 % of surface area**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8.

### **A.11 Radiographic testing (RT) of weldments on 100 % of weld**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 2.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, UW-51, for linear indications and ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 4, for rounded indications.

### **A.12 Ultrasonic testing (UT) of full-penetration welds on 100 % of weld**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 4.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 12.

### **A.13 Magnetic-particle testing (MT) of welds on 100 % of weld surface area**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 7.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 6 or ISO 23278.

#### **A.14 Penetrant testing (PT) of welds on 100 % of weld surface area**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8 or ISO 23277.

#### **A.15 Magnetic-particle testing (MT) of bolting**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 7.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 6.

#### **A.16 Penetrant testing (PT) of bolting**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8.

#### **A.17 Magnetic-particle testing (MT) on 100 % of machined surfaces**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 7.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 6.

#### **A.18 Penetrant testing (PT) on 100 % of machined surfaces**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8.

#### **A.19 Penetrant testing (PT) of weld bevels of welding ends**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8.

#### **A.20 Magnetic-particle testing (MT) of weld bevels of welding ends**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 7.

Acceptance shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 6.

### **A.21 Penetrant testing (PT) of weld overlay**

Examination shall be carried out in accordance with ASME Boiler and Pressure Vessel Code, Section V, Article 6.

Acceptance criteria for non-machined overlay shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8, except that relevant indications (rounded and linear) of less than 5 mm are acceptable.

Acceptance criteria for machined overlay shall be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 8, except that there shall be no indications in the seal areas.

### **A.22 NDE volumetric and surface for weld ends**

Volumetric NDE examination of welding ends (see Clauses A.2, A.4 or A.8) shall be performed for a minimum length equal to 1,5 times the mating pipe wall thickness or 50 mm, whichever is greater. Surface NDE shall be performed on the machined ends of the valve-weld bevel per Clauses A.19 or A.20.

## Annex B (normative)

### Supplementary test requirements

#### B.1 General

This annex specifies requirements for supplementary testing, which shall be performed by the manufacturer if specified by the purchaser. The frequency of testing shall also be specified by the purchaser, if not defined in this annex.

#### B.2 Hydrostatic testing

By agreement, hydrostatic testing may be performed at pressures higher than specified in 11.3 and 11.4 and/or for periods longer than specified in Tables 9, 10 or 11.

#### B.3 Low-pressure gas seat testing

##### B.3.1 Acceptance

The acceptable leakage rate for low-pressure gas seat testing shall be

- ISO 5208:1993, Rate A (no visible leakage), for soft-seated valves and lubricated-plug valves;
- ISO 5208:1993, Rate D, for metal-seated valves.

##### B.3.2 Type I

The seat test specified in 11.4 shall be repeated at a test pressure between 0,05 MPa (0.5 bar; 7.3 psi) and 0,10 MPa (1.0 bar; 14.5 psi) using air or nitrogen as the test medium.

##### B.3.3 Type II

The seat test specified in 11.4 shall be repeated at a test pressure of 0,55 MPa ± 00,7 MPa (5.5 bar ± 0.7 bar; 80.8 psi ± 10.3 psi) using air or nitrogen as the test medium.

#### B.4 High-pressure gas testing

##### B.4.1 General

High-pressure gas testing shall be performed after hydrostatic shell testing.

**WARNING** — High-pressure gas testing involves potential hazards. Appropriate safety precautions should be taken.

## B.4.2 Seat testing

The seat tests specified in 11.2 and 11.4 shall be replaced with a high-pressure seat test using an inert gas as the test medium. The test pressure and duration shall be as specified in 11.2 and 11.4.

## B.4.3 Shell testing

Valves designated by the purchaser shall have a high-pressure gas shell test performed using inert gas as the test medium. The minimum test pressure shall be 1,1 times the pressure rating determined in accordance with 7.2 for the material at 38 °C (100 °F). The test duration shall be in accordance with Table B.1.

Table B.1 — Minimum duration of pneumatic shell tests

Valve size		Test duration min
DN	NPS	
15 to 450	½ to 18	15
≥ 500	≥ 20	30

## B.5 Anti-static testing

The electrical resistance between the obturator and the valve body and between the stem/shaft and the valve body shall be measured using a direct-current power source not exceeding 12 V. The resistance shall be measured on dry valves before pressure testing and shall not exceed 10 Ω.

At least 5 % of the valves in the order shall be tested.

## B.6 Torque/thrust functional testing

The maximum torque or thrust required to operate ball, gate or plug valves shall be measured at the pressure specified by the purchaser for the following valve operations:

- open to closed with the bore pressurized and the cavity at atmospheric pressure;
- closed to open with both sides of the obturator pressurized and the cavity at atmospheric pressure;
- closed to open with one side of the obturator pressurized and the cavity at atmospheric pressure;
- as in (c) but with the other side of the obturator pressurized.

Torque or thrust values shall be measured with seats free of sealant except where the sealant is the primary means of sealing. If necessary for assembly, a lubricant with a viscosity not exceeding that of SAE 10W motor oil or equivalent may be used.

Thrust and torque testing shall be performed following hydrostatic shell testing and, if specified, prior to any low-pressure gas seat testing.

The measured torque or thrust results shall be recorded and shall not exceed the manufacturer's documented breakaway torque/thrust.

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## B.7 Drive train strength test

### B.7.1 General

The test torque shall be the greater of

- a) twice the manufacturer's predicted break-away torque/thrust, or
- b) twice the measured break-away torque/thrust.

The test torque shall be applied with obturator blocked for a minimum time of 1 min.

NOTE For gate valves, the thrust can be tensile or compressive, whichever is the most stringent condition.

### B.7.2 Acceptance criteria

The test shall not cause any permanent visible deformation of the drive train.

For ball and plug valves, the total torsional deflection of the extended drive train when delivering the design torque shall not exceed the overlap contact angle between the seat and obturator.

## B.8 Cavity relief testing

### B.8.1 Frequency

Each valve shall be tested.

Cavity relief testing is not required if protection of the cavity against over-pressure is ensured, for both the open and the closed position, by a hole in the obturator or around the seat seal.

### B.8.2 Trunnion-mounted ball valves and through-conduit gate valves with internal-relieving seats

The procedure for cavity-relief testing of trunnion-mounted ball valves and through-conduit gate valves with internal-relieving seats shall be as follows.

- a) Fill the valve in the half-open position with water.
- b) Close the valve and allow water to overflow from the test connection at each end of the valve.
- c) Apply pressure to the valve cavity until one seat relieves the cavity pressure into the valve end; record this relief pressure.
- d) For valve types with second-seat relief, continue to increase the pressure to the cavity until the second seat relieves; record the relief pressure of the second seat.

Failure to relieve at a pressure less than 1,33 times the valve pressure rating shall be cause for rejection.

### B.8.3 Floating-ball valves

The procedure for cavity-relief testing of floating-ball valves shall be as follows.

- a) With the valve half-open, pressurize the valve to 1,33 times the valve pressure rating specified in 7.2 for the material at 38 °C (100 °F).
- b) Close the valve and vent each end to atmospheric pressure.

c) Open the valve to the half-open position and monitor for the release of test medium trapped in the cavity.

Evidence of trapped pressurizing medium in the cavity shall be cause for rejection.

## B.9 Hydrogen-induced cracking test

Process-wetted and pressure-containing parts that are manufactured, fabricated or formed from plate shall be resistant to hydrogen-induced cracking (HIC). This shall be demonstrated by successful HIC testing in accordance with NACE TM0284, except that the test solution shall comply with NACE TM0177. HIC acceptance criteria, such as the crack-sensitivity ratio (CSR), crack-length ratio (CLR) and crack-thickness ratio (CTR), shall be specified by the purchaser.

## B.10 Double-block-and-bleed (DBB) valves

With the valve half-open, the valve and its cavity shall be completely filled with test fluid. The valve shall then be closed and the valve body vent valve opened to allow excess test fluid to overflow from the valve-cavity test connection. The test pressure shall be applied simultaneously from both valve ends.

Seat tightness shall be monitored via overflow through the valve cavity connection.

## B.11 Double isolation and bleed DIB-1 (both seats bi-directional)

Each seat shall be tested in both directions.

Cavity-relief valves shall be removed if fitted. The valve and cavity shall be filled with test fluid, with the valve half-open, until the test fluid overflows through the cavity relief connection.

To test for seat leakage in the direction of the cavity, the valve shall be closed. The test pressure shall be applied successively to each valve end to test each seat separately from the upstream side. Leakage shall be monitored via the valve cavity pressure relief connection.

Thereafter, each seat shall be tested as a downstream seat. Both ends of the valve shall be drained and the valve cavity filled with test fluid. Pressure shall then be applied whilst monitoring leakage through each seat at both ends of the valve. Some valve designs can require the balancing of the upstream and valve cavity pressure during the downstream seat test.

## B.12 Double isolation and bleed DIB-2 (one seat uni-directional and one seat bi-directional)

The bi-directional seat shall be tested in both directions.

Cavity-relief valves shall be removed if fitted. The valve and cavity shall be filled with test fluid, with the valve half-open, until the test fluid overflows through the cavity relief connection.



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To test for seat leakage in the direction of the cavity, the valve shall be closed. The test pressure shall be applied successively to each valve end to test each seat separately from the upstream side. Leakage shall be monitored via the valve cavity pressure relief connection.

To test the bi-directional seat from the cavity test, pressure shall be applied simultaneously to the valve cavity and upstream end. Monitor leakage at the downstream end of the valve.

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## **Annex C**

### **(informative)**

### **Supplementary documentation requirements**

The purchaser may select supplementary documentation to be provided from the list below:

- a) NDE records;
- b) WPS;
- c) PQR;
- d) WPQ;
- e) for sour service valves, certificate of compliance to ISO 15156 (all parts);
- f) hardness test report on pressure-containing parts;
- g) hardness test report on pressure-controlling parts;
- h) certificate of conformance to this International Standard;
- i) heat treatment certification records (e. g. charts);
- j) design calculations for pressure-containing parts and/or the drive train;
- k) design calculations for pressure-controlling parts;
- l) pressure test report, (including pressure, test duration, test medium and acceptance criteria);
- m) NDE personnel qualification records;
- n) coating/plating certification;
- o) NDE procedures;
- p) calibration records (purchaser to identify requirements for equipment when ordering);
- q) fire type-test certificate;
- r) material inspection certificates in accordance with ISO 10474 or EN 10204, as applicable (the purchaser shall specify the type of certification, and for which parts, when ordering);
- s) design verification by certification body/agency;
- t) type approval by certification body/agency;
- u) installation, operation and maintenance instructions/manuals;
- v) general arrangements drawings;
- w) cross-sectional drawings with parts and materials list;
- x) flow coefficient,  $C_v$  or  $K_v$ ;
- y) current quality management system certificate.

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## **Annex D** (informative)

### **Purchasing guidelines**

#### **D.1 General**

This annex provides guidelines to assist the purchaser with valve type selection and specification of specific requirements when ordering valves.

#### **D.2 Field testing**

Pressures during the testing of installed valves should not exceed the pressure rating of the valve by more than 50 % when testing with the valve partially open or by more than 10 % when testing against a closed valve.

Tests specified with the valve half-open may also be performed with the valve fully open, provided the body cavity is simultaneously filled and pressurized through a cavity connection.

NOTE The maximum test pressure for valves fitted with an external pressure relief can be lower (see 7.8).

#### **D.3 Pressure relief**

Certain valve designs trap pressure in the valve body cavity when the valve is in the fully open and/or closed position. High internal pressures can result from the thermal expansion of the fluid trapped in these confined areas.

If the valve has no self-relieving design provision, pressure-relief fittings shall be fitted in the valve body in accordance with 7.8.

#### **D.4 Pigging**

The purchaser should examine the valve design for piggability when ordering valves for use in pipelines requiring pigging.

NOTE 1 Venturi or reduced-bore valves are not suitable for most pigging operations, including intelligent pigging, but can allow the passage of foam pigs.

NOTE 2 A valve in which the drive member or the obturator obstructs the bore in the otherwise fully open position (e.g. a dual-plate check valve) is not piggable.

NOTE 3 Certain full-opening valves with pockets can allow bypass of fluid around a short pig or sphere.

#### **D.5 Fire type-testing**

The fire-resistance design of valves shall be qualified by fire type-testing in accordance with ISO 10497.

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Fire resistance designs already qualified to ISO 10497, API 6FA, API 6FC, API 6FD or API 607 are also acceptable.

## **D.6 Additional testing**

The purchaser shall specify any additional test requirements not covered by this International Standard.

## **D.7 Valve data sheet**

The valve data sheet in Table D.1 can be used to assist with the specification of valves for ordering.

## **D.8 Information to be provided**

Table D.2 provides a list of information that it is necessary for the purchaser and or manufacturer to provide.

**Table D.1 — Valve data sheet**

Materials of construction _____
Valve location and function _____
Nominal valve size _____
Maximum operating pressure _____
Maximum field test pressure (see Clause D.2) _____
Valve pressure class _____
Maximum service temperature _____
Minimum service temperature _____
Liquid or gas service _____
Flow medium composition _____
Special flow requirements: Blow down, solids, pigs, etc. _____
<b>Valve</b>
Type of valve: _____ Gate _____ Plug _____ Ball _____ Check _____
Design type _____
Full round opening required? _____ Minimum bore _____
<b>End connections</b>
Upstream pipe: OD _____ ID _____ Material _____
Flanged end? Yes _____ No _____
Plain raised face or ring joint? _____
If ring joint, flat or raised face? _____
Size and pressure class, as per ASME B16.5 or MSS SP-44 _____ or ASME B16.47, Series A _____
Ring gasket or other gasket type and size _____
Note: Gaskets are not furnished as a part of the valve.
Welding end? Yes _____ No _____
Attach specifications for welding-end configuration.
Special flanges or mechanical joints? _____
Downstream pipe: OD _____ ID _____ Material _____
Flanged end? Yes _____ No _____
Plain raised face or ring joint? _____
If ring joint, flat or raised face? _____
Size and pressure class, as per ASME B16.5 or MSS SP-44 _____ or ASME B16.47, Series A _____
Ring gasket or other gasket type and size _____
Note: Gaskets are not furnished as a part of the valve.
Welding end? Yes _____ No _____
Attach specifications for welding-end configuration.
Special flanges or mechanical joints? _____
Length: Any special requirements for end-to-end or face-to-face dimensions? _____

Table D.1 (continued)

<p><b>Valve operation</b></p> <p>Is gearbox with hand-wheel required? If so, give details: _____</p> <p>For a hand-wheel on a horizontal shaft, give distance from centreline of valve opening to hand-wheel: _____ mm</p> <p>Or, for a hand-wheel on a vertical shaft, give distance from centreline of valve opening to centre of rim of hand-wheel: _____ mm</p> <p>NOTE For plug valves having loose wrenches, it is necessary to order wrenches separately.</p> <p>Wrench required? _____</p> <p>Locking device required? _____ Type _____</p>
<p><b>Valve support</b></p> <p>Support ribs or legs required? _____</p> <p>Other requirements</p> <p>Supplementary requirements (see Annex B and Annex C) _____</p> <p>Fire test design? Yes _____ No _____</p> <p>ISO 15156 (all parts)? Yes _____ No _____</p> <p>Pressure relief: If pressure relief devices are required, are there special requirements for these devices? _____</p> <p>Drain connections: Any requirements? _____</p> <p>Bypass connections: Any requirements? _____</p> <p>Supplementary documentation required? (see Annex C) _____</p> <p>Third-party witness of processes/testing _____</p> <p>Painting or coating required? _____</p>

**Table D.2 — Summary of information needed to be provided by manufacturer and/or purchaser**

Clause/subclause	Information	Provider <sup>a</sup>
6.2.2	Reduced bore sizes other than those shown in tables	P
6.2.2	Obturator size for non circular openings	A
6.2.2	Obturator openings in reduced bore valves above DN 600	A
7.1	Pressure vessel design	A
7.2	Intermediate design pressure and temperatures	P
7.2	Minimum design temperature	P
7.4	Face-to-face or end-to-end dimension	A
7.4	Tolerances other than those listed	A
7.5	Advise MPD	P
7.5	Valve operation data, torque/thrust, $C_v$ , $K_v$ or number-of-turns data	M-P
7.6	Requirements for piggability	P
7.7.1	Alternate standard for flanges	A
7.7.2	Weld bevels	A
7.7.2	Mating pipe data	P
7.7.3	Other end connections	P
7.8	Determination of whether fluid can become trapped in valve cavities	M
7.8	Pressure relief, if not required for liquid or condensing service	A
7.8	Pressure relief, if required for gas service	A
7.8	Requirements for in-service testing	P
7.9	Alternative vent/drain connections	P
7.9	Thread profiles	A
7.9	Connection sizes	A
7.10	Sealant injection	P
7.11	Requirement for extended drain, vent or injection points	P
7.11	Securing of drain, vent and sealant lines	A
7.11	Design pressure and size, etc., of extended drain, vent and sealant lines	P
7.11	Maximum injection pressure for extended injection lines, in absence of purchaser specification	M
7.11	Size of sealant lines	A
7.12	Requirement for valves in vent, drain and injection lines	P
7.13	Wrench head design	P
7.13	Handwheel diameter(s)	A
7.13	Number of turns	M
7.14	Locking devices	P
7.18.1	Actuator output, if greater than drive train strength	A

Table D.2 (continued)

Clause/subclause	Information	Provider <sup>a</sup>
7.19	Lifting points	A
7.19	Lifting procedure	M
7.20.3	Demonstration of valve function under pressure and pipe loads and moments	M
7.22	Requirements for fire-type-testing certification	P
7.22	Fire type-testing certificate if not in accordance with Clause D.5	A
7.23	Anti-static device, if not provided on soft seal valve	A
7.23	Anti-static device testing per Clause B.5	P
8.1	Material specification	A
8.2	Commissioning fluids	P
8.4	Composition limits	A
8.4	Chemical composition of welding end	A
8.4	Chemical composition of other materials	A
8.5	Charpy tests for other materials	A
8.6	Bolting for hydrogen embrittlement	A
8.7	Sour-service requirements	P
8.7.2	HIC acceptance criteria	A
9.1	Additional welding requirements to meet pipeline requirements	P
9.3	Use of other hardness test methods	A
9.4	Through-wall weld repairs	A
9.4	Weld repairs to correct defects in plates and forgings	A
9.4	Specification for defect removal and repair	M
10.1	NDE requirements	P
10.4	NDE before final heat treatment	A
10.4	NDE requirements for weld repair	P
10.5	NDE of weld ends	P
11.1	Supplementary tests in Annex B	P
11.1	Use of light oil as an alternative to water for test media	A
11.1	Test sequence	A
11.1	Use of antifreeze in test water	A
11.3	Method of closing ends	A
11.4.1	Lubricant removed for testing	A
11.4.3	Other leakage rates	A
11.4.4.3	Valve seat functionality	P
11.4.5	Cavity relief test	P-M
11.4.7	Alternative test: high-pressure gas in lieu of water	A
11.5	Pneumatic testing of drain, vent and sealing lines	A



**Table D.2 (continued)**

Clause/subclause	Information	Provider <sup>a</sup>
11.5	Test pressure of sealant injection lines	A
12	Coating requirements	A
13	Omission of marking requirements on valves NPS 2 and smaller	A
13	Marking requirements	P
15	Requirement for longer data-retention period	P
15	Requirement for supplementary information	P
Annex A	NDE requirements	P
Annex B	Supplementary test requirements	P
Annex C	Supplementary documentation requirements	P
Annex D	Purchasing guidelines	P
<sup>a</sup> M indicates information to be supplied by manufacturer; M-P indicates information to be supplied by manufacturer when required by purchaser; P indicates information to be supplied by purchaser; A indicates information to be established by agreement.		