

THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

SPECIFICATION FOR PRODUCTION TESTING OF VALVES PART 4 – BUTTERFLY AND GLOBE VALVES

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THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

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FOREWORD

This specification has been developed by the EEMUA Valves Committee and is intended to improve the ex-works quality of production butterfly and globe valves designed and manufactured to BS, API and other standards for valves required for use in the energy, process, oil and gas industries.

Being essentially similar, the test requirements of butterfly and globe valves have been combined in one document: both valve types have a single seat against which a disk is held by mechanical force.

Use of Language

In this document the words 'will', 'may', 'should', 'shall' and 'must', when used in the context of actions by the purchaser or others, have specific meanings as follows:

- i) 'Will' is used normally in connection with an action by the purchaser, rather than by a manufacturer or supplier.
- ii) 'May' is used to indicate that the manufacturer or supplier is permitted to do something, or the purchaser reserves the right to do something according to context.
- iii) 'Should' is used where a provision is preferred.
- iv) 'Shall' is used where a provision is mandatory.
- v) 'Must' is used only where a provision is a statutory requirement.

Units

This specification employs SI units, but additionally includes Imperial units where appropriate to common usage. *Note:* 'bar' signifies bar gauge.

1. SCOPE

This specification sets out the production test requirements to be applied to each valve unless otherwise specified by the purchaser. Tests of an optional nature are also included.

The specification is applicable to flanged, butt weld, socket weld, extended weld end and threaded end globe valves with soft or hard seats from Class 150 (PN 20) to Class 2500 (PN 420) rating and nominal bore sizes from ¼" (DN 8) to 16" (DN 400) or larger at the discretion of the purchaser, and to flanged, wafer type and butt weld end butterfly valves with soft or hard seats from Class 150 (PN 20) to Class 600 (PN 100) rating, or higher at the discretion of purchaser, and nominal bore sizes from 1½" (DN 40) to 36" (DN 900) or larger at the discretion of purchaser. The specification does not apply to valves used exclusively for control purposes. When called up by the purchase order, this specification replaces entirely the production tests invoked in the product standards.

Tests outside the scope of this specification include material sampling and non-destructive testing of valve materials to verify their physical properties, chemical analysis and quality. Type approval tests, fire tests, high pressure gas tests, and tests at high and low temperature, are also excluded.

2. REFERENCES

This EEMUA specification makes reference to the publications listed below. Unless otherwise specified the latest editions of these publications including all addenda and revisions shall apply.

2.1 British Standards

BS 1780	Specification for bourdon tube pressure and vacuum gauges
BS 6755	Testing of valves: Part 1: Specification for production pressure testing requirements
BS EN 30012-1 (formerly BS 5781: Part 1)	Quality assurance requirements for measuring equipment: Metrological confirmation system for measuring equipment

2.2 American Petroleum Institute Standards

API Std 598	Valve inspection and testing
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2.3 American National Standards: American Society of Mechanical Engineers

ASME* B16.5	Pipe flanges and flanged fittings, steel, nickel alloy and other special alloys
ASME* B16.34	Valves: flanged, threaded and welding end
* Previously ANSI	

2.4 International Organization for Standardization

ISO 5208	Industrial valves: pressure testing for valves
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3. DEFINITIONS

3.1 Hard Seated Valve

A valve having primary seats manufactured from metallic or ceramic materials.

3.2 Soft Seated Valve

A valve having one or more primary seat members manufactured from polymers, elastomers or similar resilient or semi-resilient material.

3.3 Valve Rated Pressure (VRP)

The maximum allowable working pressure at ambient temperature as stated in ASME B16.34 (or ASME B16.5) for the valve body material.

3.4 Purchaser

The user or his contractor.

3.5 Purchaser's Inspector

An inspection engineer employed by the purchaser, or the inspection authority appointed by the purchaser.

4. TEST EQUIPMENT AND FACILITIES

4.1 General

- 4.1.1 The manufacturer shall supply all labour, tools and materials required to perform the tests and inspections.
- 4.1.2 The manufacturer shall be able to demonstrate to the satisfaction of the purchaser the adequacy of the methods and equipment used to carry out and monitor the testing.
- 4.1.3 The manufacturer shall be responsible for the safety and design of test equipment and for providing adequate safeguards for personnel in the areas of the test.
- 4.1.4 The valve shall be adequately illuminated and accessible for inspection.
- 4.1.5 The test equipment and method of pressurising the valve shall ensure that all pressure containing parts of the valve are strength tested and, for other than wafer style valves, do not reduce the stresses associated with internally pressurising a valve with blank ends attached. (See Note 1 below.)

Approved methods of blanking valve ends for pressure sealing are:

- a) blank flanges or covers for flanged end valves
- b) weld end caps with or without pups for weld end valves
- c) screwed plugs for threaded end valves.

Alternative pressure sealing methods may be used when agreed in writing by the purchaser, provided the validity of the valve design has been proven by prototype testing with blank ends attached to the valve. (See Note 2.)

Note 1: When blank ends are attached to a valve then maximum longitudinal tensile stresses are developed when the valve is internally pressurised. This will assist in detecting cracks in the valve materials and weakness in bolted joints and other connecting parts.

Note 2: A reduction in longitudinal stresses in the valve body can result from some alternative pressure sealing methods, e.g. clamping valve ends in a press and internally sealing valve bores with 'floating bungs'. The ends of valve bores sealed by 'floating bungs' will not be subjected to the test pressure and may require supplementary NDT.

- 4.1.6 The test facilities shall permit complete (and demonstrable) isolation of the valve from the pressure source.
- 4.1.7 The accuracy and sensitivity of measuring devices to meet the requirements of this specification shall be demonstrable. The calibration of volumetric devices shall be performed with the same test fluid and at the same temperature within the tolerances permitted as for the tests.

Note: Guidance on measurement and calibration systems can be found in BS EN 30012-1.