

**AMERICAN NATIONAL STANDARD**

**ANSI/ISA-75.19.01-2007**

**Hydrostatic Testing  
of Control Valves**

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ANSI/ISA-75.19.01-2007  
Hydrostatic Testing of Control Valves

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## Preface

ANSI/ISA-75.19.01-2001 was revised in 2006 to include the changes in ASME B16.34-2004, Valves-Flanged, Threaded, and Welding End. All pressure-temperature ratings in ASME B16.34 were recalculated using data from the latest edition of the ASME Boiler and Pressure Vessel Code, Section II, Part D. As a result, some materials have been shifted to other material groups and some changes have been made to some valve pressure ratings within material groups. Seven material groups were added and about 15% of the 38°C (100°F) pressure ratings were changed, either increased or decreased, from the prior edition. Because of diminished interest for flanged end valves conforming to ASME Class 400, Class 400 is not specifically listed in ASME B16.34-2004 and is not included in the 2007 edition of ANSI/ISA-75.19.01. Provision has been made to allow Class 400 valves to be furnished as intermediate rated valves. The 2007 edition of ANSI/ISA-75.19.01 uses metric units as the primary reference units while maintaining U.S. customary units in reference tables. This follows the lead of ASME B16.34-2004 that states their goal is to delete the U.S. customary units when the standard is next issued.

This preface, as well as all footnotes and annexes, is included for informational purposes and is not part of ANSI/ISA-75.19.01-2007.

This standard has been prepared as part of the service of ISA toward a goal of uniformity in the field of instrumentation. To be of real value, this document should not be static, but should be subject to periodic review. Toward this end, the Society welcomes all comments and criticisms, and asks that they be addressed to the Secretary, Standards and Practices Board; ISA; 67 Alexander Drive; P. O. Box 12277; Research Triangle Park, NC 27709; Telephone (919) 990-9227; Fax: (919) 549-8288; e-mail: standards@isa.org.

The ISA Standards and Practices Department is aware of the growing need for attention to the metric system of units in general and the International System of Units (SI) in particular, in the preparation of instrumentation standards, recommended practices, or technical reports. The Department is further aware of the benefits to U.S.A. users of ISA standards of incorporating suitable references to the SI (and the metric system) in their business and professional dealings with other countries. Toward this end, this Department will endeavor to introduce SI-acceptable metric units in all new and revised standards to the greatest extent possible. *The Metric Practice Guide*, which has been published by the Institute of Electrical and Electronics Engineers as ANSI/IEEE Std. 268-1992, and future revisions, will be the reference guide for definitions, symbols, abbreviations, and conversion factors. Certain metric units that are part of the SI system are in common accepted pressure measurement that is convertible to kilopascals by multiplying by 100.

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## 1 Scope

1.1 This standard applies to control valves having bodies, bonnets, cover plates, and bottom flanges made of carbon steel, low alloy and high alloy (stainless) steel, nickel-base alloy, cast iron, and ductile iron.

1.2 This standard establishes requirements and definitions for standard hydrostatic shell testing of control valves by the valve manufacturer to prove the structural integrity and leak tightness of the valves' pressure retaining parts, including any closure parts such as the valve body to bonnet joint, but excluding packings, bellows or other moving seals, and packing leakoff/purge/vent port connections. Bellows or similar moving stem seals may be pressure tested after assembly at a pressure to be agreed upon by the valve manufacturer and the purchaser. The requirements of this standard do not cover pneumatic and hydraulic actuators and regulators.

1.3 This standard describes and specifies the specific circumstances of hydrostatic shell testing of control valves and is in accordance with the hydrostatic testing requirements of ASME B16.1, ASME B16.34 and ASME B16.42 with the exception that the test requirements of paragraph 4.8 are not allowed by ASME B16.34.

1.4 **WARNING** – Serious bodily harm can be caused by high velocity leaks through the shell or seals, resulting from the energy stored in the pressurized fluid and containment equipment. Care should be exercised to ensure the safety of test and inspection personnel. Specific safety requirements for conducting hydrostatic testing and inspection are not within the scope of this standard.

## 2 Definitions

2.1 control valve:  
refer to ANSI/ISA-75.05.01-2000 (R2005), *Control Valve Terminology*.

2.2 test fixture:  
a test fixture is a device to close off the end connections and/or stem seal areas of the control valve to allow pressurization for hydrostatic shell testing.

## 3 Test fixture and instrumentation

3.1 Test fixtures include, but are not limited to, the following: plugs with tie-bars and tie-rods, hydraulic presses, plugs or flanges attached to the pipe connections, bosses or lugs on the valve, and expandable rubber plugs. For butt welding end valves when end plugs are used, the seal point shall be as close to the weld end as practical without overstressing the weld preparation.

3.2 The analog or digital pressure measuring instruments used in testing shall be of the indicating or recording type.

3.3 The valve manufacturer shall be responsible for maintaining the accuracy of the pressure measuring instruments.

3.4 Pressure measuring instruments shall be accurate within 3% at test pressure, and analog-type shall be used between 20% and 80% of their scale range.

## 4 Test requirements

4.1 The control valve, with or without its actuator, must be complete before hydrostatic shell testing, except as permitted in 4.2, 4.3, 4.4, and 4.8.