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, *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.