

Recommended Specifications for Severe Service Control Valves

Liquid Applications

1.0 Trim Exit Velocity

- 1.1 For liquids, the Trim Exit Velocity shall not exceed 100 ft/sec. (30 m/sec.).
- 1.2 For flashing service, the Trim Exit Velocity shall not exceed 75 ft/sec. (22.5 m/sec.).
- 1.3 Supplier shall provide calculation demonstrating satisfactory compliance to the above mentioned Trim Exit Velocity requirements.

2.0 Pressure Reducing Turns

- 2.1 Supplier shall provide a sufficient number of discrete pressure drop turns to insure the elimination of:
 - Vibration
 - Erosive Action
 - Cavitation
- 2.2 Supplier shall identify the number of pressure drop turns in proposed equipment.

3.0 Flow Direction

- 3.1 Flow direction shall be a flow to close (over-the-plug) configuration.

4.0 Protection of Valve Internals

- 4.1 Suppliers shall provide means to protect the valve internals from foreign particles such as weld slag.

Gas and Steam Applications

1.0 Velocity Head

- 1.1 Velocity Head in the trim shall be less than 70 psia (480 kPa) in order to eliminate:
 - Vibration
 - Erosive Action
 - Control Noise (to the specified dBA level)

Velocity Head is defined as: $V_h = \frac{\text{Density} \times V^2}{2g_c}$

- 1.2 Supplier shall provide calculation demonstrating meeting the above Velocity Head requirements.

2.0 Pressure Reducing Turns

- 2.1 Supplier shall provide a sufficient number of discrete pressure drop turns to insure the elimination of:
 - Vibration
 - Erosive Action
- 2.2 Supplier shall identify the number of pressure drop turns in proposed equipment.

Liquid, Gas and Steam Applications

1.0 Noise

- 1.1 The maximum allowable noise level shall be 85 dBA or less at 3.3 feet (1 meter) from the downstream bare pipe surface.
- 1.2 The specified noise level shall be attained without the use of orifices, mufflers, diffusers, and/or credit for thermal or acoustic insulation.
- 1.3 Supplier shall provide calculation demonstrating meeting the above noise requirements.

2.0 Valve Trim

- 2.1 Valve shall have quick-change type trim utilizing top entry. No components shall be screwed or welded into the body.
- 2.2 The valve shall have equal pressure distribution around the plug.

3.0 Seating Forces

Based on the specific leakage class, the valve shall have as a minimum the seating forces shown below:

- 3.1 Class IV (FCI70-2) - 300 lb. per linear inch of seat ring circumference (7 kg/mm).
- 3.2 Class V (FCI70-2) - 500 lb. per linear inch of seat ring circumference (13 kg/mm).
- 3.3 MSS - SP61 (Block Valve)
 - For less than 3,000 psi (21 Mpa) – 1,000 lb. per linear inch of seat ring circumference (18 kg/mm).
 - For greater than 3,000 psi (21 Mpa) – 1,500 lb. per linear inch of seat ring circumference (27 kg/mm).