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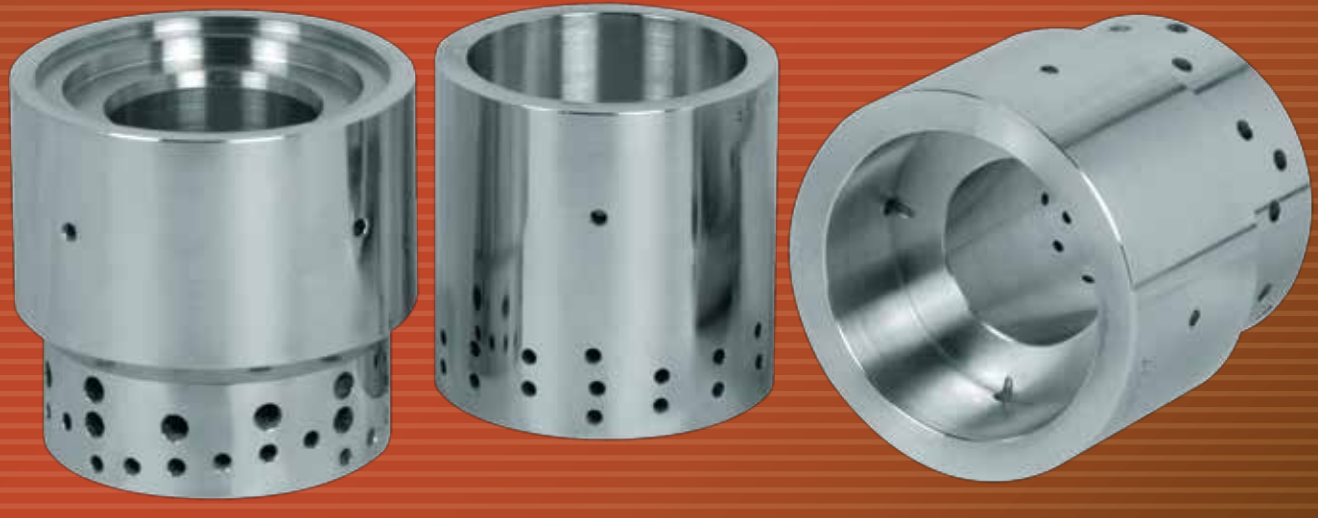
MASCOT

Cavitation Control



CavFlo

CavFlo

Cavitation Control Trim

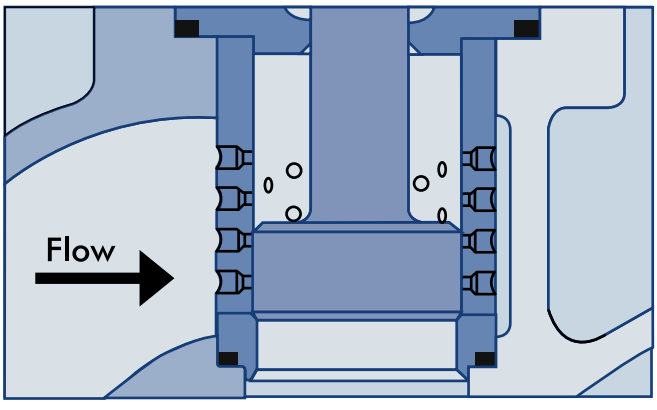
Cavitation damage to valve components is effectively minimized by controlling the location of vapor bubble implosion in an area away from metal parts in the Mascot CavFlo trim.

Cavitation Damage - A problem :

Whenever the pressure of flowing liquid through a restricted area of a control valve drops below the vapor pressure of the liquid and recovers to a pressure above the vapor pressure, cavitation damage to control valve and piping components may occur. In the first stage of cavitation, vapor bubbles form downstream of the restricted area at the vena contracta (point of narrowest fluid constraint).

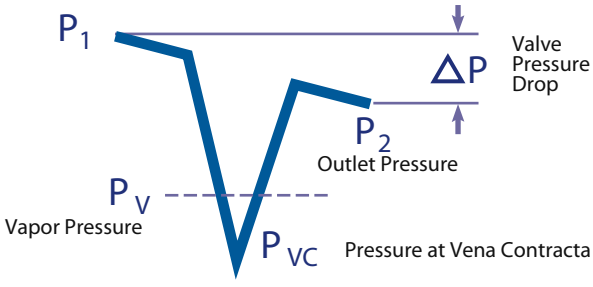
The enlarging passage at downstream of the vena contracta reduces the velocity and thereby associated pressure recovery causes the vapor bubbles collapse or implode suddenly.

This implosion of the bubbles on metal surfaces causes stresses eventually resulting in tearing away particles of the metal from the surface towards inward. Cavitations damages plug and seat of a control valve as throttling occurs at the restriction in the clearance between the plug and seat ring. If the vapor bubbles implode near them, the valve body and piping can also be damaged. Conventionally harder material is used to minimize



Cavitations Control Trim - A Solution :

Mascot's CavFlo Trim utilizes many small holes for diametrical flow through the walls of the seat retainer. As the valve plug lifts, increased pairs of holes are opened. Each hole discharges a jet of cavitating liquid at the center of retainer, which impinges with a jet of liquid admitted through the opposing hole.



Pressure Profile: Single Seat Valve Experiencing Cavitation

The impinging fluid jets form an area of pressure recovery and a fluid cushion. This phenomenon collapses the vapor bubbles in the fluid stream, away from metal parts preventing damages. Stepped holes are used to ensure solid flow and not the hollow tube like flow through the retainer. Thus vena contracta established outside the retainer and not in the retainer. The turbulence of the flow inside the retainer promotes collapsing of the vapor bubbles in the middle of seat retainer, reducing damage to valve trim. CavFlo Trim fits standard GFlo series valve bodies, with pressure-balanced and unbalanced options being available. Because the valve plug slides in the retainer closely, regulating the fluid flow through the holes, the fluid must be free from dirt and pipe muck to avoid seizing of plug with retainer. Size and spacing of holes in the retainer determine flow characteristics and capacity. To achieve desired flow characteristic different sizes of holes with variable spacing can be used on the same size of retainer. CavFlo Trim will always use flow direction of valves as over the plug.

Standard Materials of Construction

Seat Retainer	316 stainless steel or 416 hardened stainless steel
Plug	316 stainless steel with Stellite facing
Seat Ring	316 stainless steel with Stellite facing

NOTE: Refer to Mascot's Globe Valve Body Assembly Bulletin for additional specifications. C C can reduce cavitation damage in low pressure services.

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