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Reference:	**High Technology Trim**	Pages:	**2**

Subject: Avalanche Cascade Trim

DESCRIPTION

The Blakeborough Avalanche Cascade trim offers the features of a multi stage labyrinth trim whilst maintaining discrete stages of pressure letdown of the cascade trim. The trim is used in control applications where high noise levels or cavitation would be predicted, with a standard design trim.

The trim is designed with a tortuous flow path. The flow is first directed through a the stages of a cascade trim (refer to standard catalogue) and then passes down the length of an extended plug nose. The flow weaves in and out of the plug and seat, gradually dropping pressure through carefully controlled flow orifices.

The extended trim is specifically designed to extend the range of the conventional cascade trim, where the required flow areas cannot be accommodated by the cylindrical rings of the cage. The number of stages of pressure letdown accommodated in the valve trim is dependent on the valve operating conditions, but typically 7 or 9 stages of pressure letdown are normal.

The Avalanche Cascade valve is designed for high pressure drop applications where noise, flow erosion and/or vibration can be a problem. The trim is designed to close tolerances and consists of a plug with an extended nose which is split into a series of galleries. The galleries become active at both the inlet and outlet, meaning that pressure is dropped both as it enters the gallery and as it exists the gallery. This ensures that the maximum stages of pressure letdown are fitted into a minimum geometrical area.

The plug is drilled with a series of radial holes where the exposed flow area is controlled by the modulation of the valve. Jet impingement and turbulence levels are controlled within the plug and cage. Impingement of the jets within the trim produces a more stable downstream flow, reduces the effect of large scale separation and produces a smaller scale turbulence structure at the valve outlet.

The trim is constructed from wear resistant materials. Depending on the pressure drop, ceramic of carbide materials are used for controlling the highest pressure letdown stages.

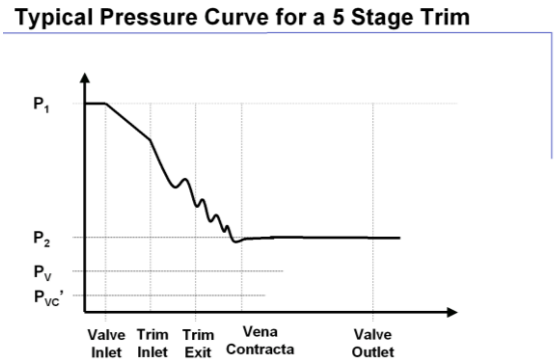
The numbers and sizes of holes in both the cage and plug are carefully controlled so the flow area is gradually increased to allow the correct apportionment of the pressure drop.

Technical Bulletin Continuation Sheet

PRESSURE DROP

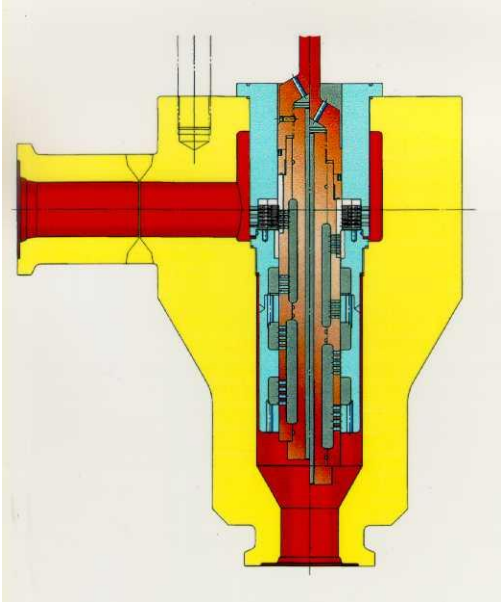
The graph below shows the typical pressure drop curve for a five stage trim. It can be seen that the largest pressure drop is taken at the valve inlet. At the valve outlet, the careful design of the flow areas means that the pressure drop is minimised, thereby eliminating the potential for cavitation.

Typical Pressure Curve for a 5 Stage Trim



APPLICATION

- Capable of handling large pressure drops while eliminating cavitation.
- Wide range of trim characteristics – Linear or equal percentage offered as standard.



- High rangeability, in excess of 100 to 1
- The modulation of the valve plug creates a resistance to cavitation by maintaining a high local exit pressure and preventing the formation of vapour bubbles.

DESIGN

- Inlet and outlet sizes from 1” to 6” (25mm to 150mm).
- Easy maintenance as all valve internals are serviceable through the top of the valve
- Valves available in either globe or angle designs.
- Valve trim available in various configurations depending on the pressure letdown.
- The flow sleeves protect the body wall from high velocity flow jets.

COMPONENTS

- The extended plug length means that the plug seating face is removed from the actual throttling zone.
- Hardened materials including ceramic of tungsten carbide are used to resist erosion damage.