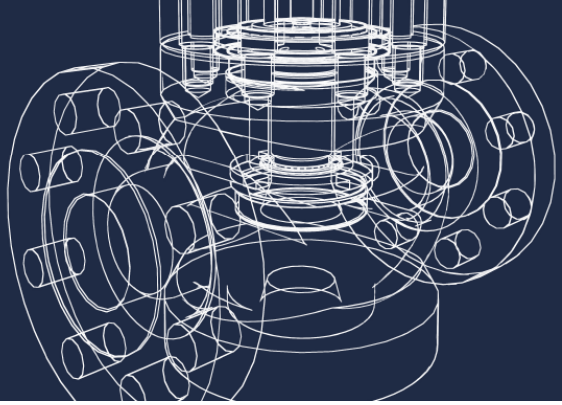

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Multistage Tungsten Carbide Trims (CCD) for Choke Valve Applications
IM-43

It is recognised that the single and double stage carbide choke trims readily available from most choke valve manufacturers, are not able to provide the sufficient number of discrete pressure reduction stages required to maintain fluid velocities at a level needed to minimise erosion, cavitation, noise and vibration, the presence of which has a massive effect on the availability of the choke for prolonged use.

The presence of sand in production and injection fluids, often means that even multi-stage labyrinth type trims manufactured in wear resistant metals do not offer the best performance expectancy.

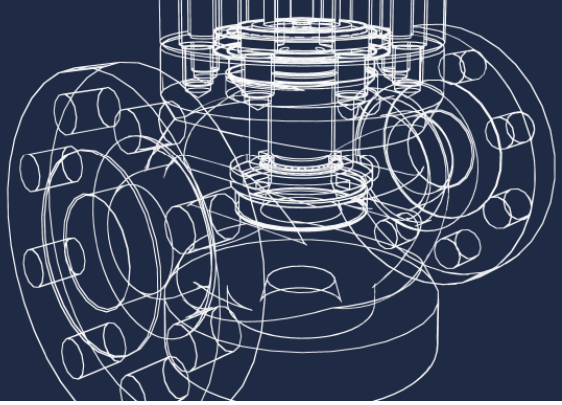
Therefore, utilising the world renowned and field proven ability of The Severn Global Group in the area of Severe Service applications, coupled with over 60 years of providing multistage letdown trims of both cage and labyrinth design, the CCD Tungsten Carbide labyrinth disc stack trim has been developed for severe choke applications.

Design and Features

The CCD trim is made up of a number of solid Tungsten Carbide plates, each having flow passages formed radially into them.

Throughout its passage through the trim, the fluid is caused to make a specified number of 90 degree turns and is split and intermingled at each stage. This tortuous flow path requires the fluid to convert pressure energy at each stage thus controlling the pressure reduction process by providing the correct number of stages for the application.

The solid Tungsten Carbide construction provides maximum erosion resistance from sand laden fluids, which coupled with effective velocity control provides a severe service choke trim designed for lasting operation.



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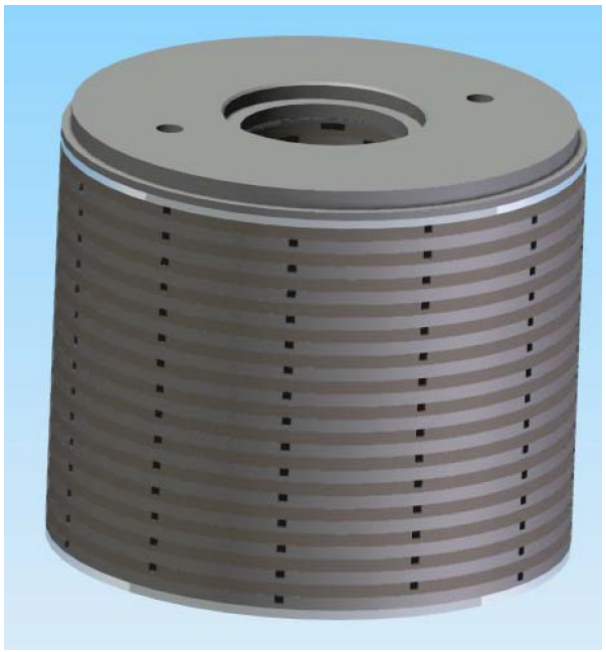
Features Include:

- Fully sintered stack providing one single homogenous Tungsten Carbide component.
- Radial flow path only, avoiding vertical turns which have been shown in other manufacturers Tungsten Carbide choke stacks to erode plate separators and cause premature failure.
- Expanding flow passages allowing free movement of particles through the trim.
- Internal pressure equalisation at each stage of letdown, ensuring an even pressure profile throughout the trim.
- Carefully engineered clearances, balance hole ports, seals and containment methods developed through years of sand application experience.



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