

Tungsten Carbide Trim Style IM-30

Tungsten Carbide Trim Components

Severn have many year's experience in the use of Tungsten Carbide as wear resistant components for valve trims in sand laden duties, generally this experience has been gained in the development of valve trims to extend operating life of valves on applications such as:

- Oil and produced water level control of production and test separators
- Sand jetting valves
- Production choke valves
- MOL pump recycle
- Slug catcher level control

The above applications vary in severity in terms of pressure drop, nature and quantity of sand as well as the tribological properties of the fluid/sand mix.

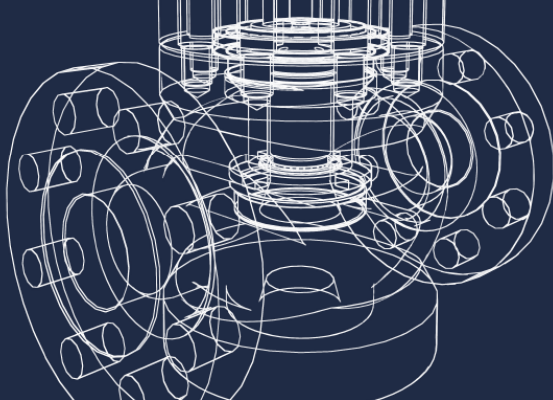
Severn have developed a modular approach to the application of Tungsten Carbide which has been field proven to provide the necessary protection with reasonable cost impact, the three basic modules are as follows:

Carbide Seating and Controlling Areas

Where pressure drops are low to medium and/or sand quantity is low, experience has shown that the area's most vulnerable to erosion are the lower portion of the plug which includes the seat face and the controlling edge, the seat bore and seat face.

In this particular design, a solid and robust Tungsten Carbide ring which forms the seat face the lower surface of the plug and a significant portion of the lower outside diameter of the plug, the controlling edge and area immediately above, is bolted to the valve plug.

This ring provides erosion resistance for the portion of the plug which handles the control of flow through the cage and where the higher velocities will manifest, also the seating face is solid Tungsten Carbide to ensure maximum longevity of the valves ability to shut off.



The seat ring incorporates a large section, Tungsten Carbide ring, which forms the seat internal bore, the seating face and a significant portion of the seat to cage location.

All other areas of the trim are stellited or specified in more erosion resistant materials.

Solid carbide Cage

Where pressure drops and sand content become more severe, Severn incorporate all of the features described above with the addition of a solid, large section Tungsten Carbide cage with holes of high length to diameter ratio.

This ensures that all the controlling surfaces of the trim are Solid Tungsten carbide and protects the cage holes from “tear dropping” as would otherwise be the case with a metallic cage in this more severe duty.

Full Carbide Plug and Multiple Cages

For the more severe duties we would provide a trim with the combined features described above but with the addition that all surfaces of the valve plug in contact with the flowing fluid are solid Tungsten Carbide.

Experience has shown that in these severe duties, sand can roughen the sliding surfaces of even a fully stellited component and subsequently adhere to the surface during stroking. This causes wear and subsequent leakage of any balance seal fitted, the ensuing leak of erosive fluid can cause significant damage to the upper portion of the plug, the balance seal assembly and in severe cases the bonnet and stem.

In this version of the trim the balance seal only runs on high hardness Tungsten Carbide which is resistant to surface degradation and therefore the effective life of the balance seal mechanism is significantly improved.

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