OPERATIONAL EQUIVALENCE TO TYPICAL DESIGNS for DuraSeal Valve

1.0 SCOPE OF INSTRUCTION

1.1. This information is provided for specification clarification of the DuraSeal Valve. The DuraSeal has operational characteristics which are unique from several industry standard valve types. These performance characteristics and the functionality of the internal parts incur different issues when addressed in the context of specifications for valves of different designs.

1.2. The contained information is subject to change without notice.

1.3. This document provides information for typical installations. In the event of unique situations, please contact your representative or the factory.

2.0 DEFINITIONS

2.1. **DBB** - Double Block and Bleed, method to test seat integrity with valve closed while under pressure.

2.2. **DIB-1** - Double Isolation and Bleed, Bi-Directional seating. API 6D definition of redundant sealing surfaces in both flow directions.

2.3. **DTR** - Differential Thermal Relief, provides the cavity relief functions of API 6D for thermal expansion control.

3.0 INHERENT CHARACTERISTICS

3.1. The valve has inherent DIB-1 function. Due to this, a DTR is required for liquid services in accordance with API 6D. The configuration of the DTR for the user system affects directionality of specific bleed and relief functions. See PUB-002-EN for DTR details.

3.2. The obturator seals do not have sliding contact during their action.

3.3. The operation of the valve is torque driven for opening and closing.

3.3.1. Opening the valve requires a torque input which lifts the plug and retracts the slips and seals from body contact. Once the slips are retracted from body contact, an operator interlock permits rotating the plug so that the waterway aligns with the flanges.
3.3.2. Closing the valve requires a torque input which rotates the slips and seals in alignment with the flanges. Then the operator interlock permits the plug to be displaced downward, mechanically driving the slips and seals onto the body surface. This creates a mechanical seal on the upstream and downstream slips.

4.0 COMPARISON TO TYPICAL DESIGNS

4.1. Ball Valves: Trunnion and Floating

4.1.1. Ball valves have a sliding of the seat on the ball surface through the entire stroke. This requires much finer finish control and corrosion protection of the ball. The DuraSeal lifting action eliminates sliding damage to the seal and reduces the criticality of surface finish and entrained solids.

4.1.2. Ball valves have sealing that is pressure energized. This makes the valves more sensitive to sealing at low differential pressures. The DuraSeal has a direct mechanical sealing function that is independent of pressure. This provides more consistent sealing across the entire pressure range.

4.2. Gate Valves: Wedge, Expanding, Slab

4.2.1. Gate valves have a sliding engagement and disengagement of the gate and seat, even for those gates with centralizers. This incurs sensitivity to surface finishes and corrosion. The non-sliding contact of the DuraSeal eliminates this sensitivity and reduces potential damage to seals.

4.3. Plug Valves: Tapered Lubricated

4.3.1. The sealing of the plug valves requires regular lubrication, the DuraSeal does not.

4.3.2. The plug valve plug requires adjustment of plug loading to ensure consistent sealing. Due to the mechanical seating of the DuraSeal, this occurs naturally on each cycle and requires no operational attention.

4.3.3. The plug valve plug has a direct contact and sliding action against the body. This requires specific attention to the body and plug surface finishes and corrosion protection. The DuraSeal does not have a sliding contact, making it more tolerant to damage of the surface finish within the body. The slip seals provide a large seal surface contacting the body.

4.3.4. The plug valve has a full contact during the entire stroke of the valve. The DuraSeal has torque peaks at end of stroke and lower torque in mid stroke, requiring lower total energy of operation.