Jamesbury: Ensuring Seat and Stem Sealing in Ball and High-Performance Butterfly Valves
Process valves have evolved to handle an increasing array of media/flush fluids to gases, high temperatures to cryogenics, and high pressure to vacuum. Through all valve seat and stem seals have played a defining role in judging the effectiveness of ball and butterfly valve solutions. Valve seat sealing materials and technologies must reliably isolate process flows where and when it is needed, particularly in the event of an emergency. Valve seal designs have to prevent hazardous emissions from leaking into the atmosphere. In addition, the structural integrity of valve bodies/castings must be maintained without fail. Human and environmental safety, process uptime and productivity, product quality and investment return depend on it.

### Seating

There are two important aspects to examine when determining the most effective seat sealing capability of valves: seat geometry and seat materials.

#### Seat Geometry: Ball Valves

Flexible lip seats, first introduced in Metso’s Jamesbury® valves in the mid-1950s, are still the proven standard in tight, long-lasting seat sealing. Jamesbury valve designs utilize a floating ball, totally unique in design and application, to create a dependable seating interface while increasing valve cycle life.

Additional, Jamesbury ball valves with flexible lip seat design can considerably lessen torques to form a tight bi-directional seal. As a result, actuation packages can be lighter and more compact.

#### Flexible Lip Seats

Flexible lip seats provide a proven solution. It’s a flexible lip seat technology that provides full bi-directional sealing, leading to reduced cost and improved process efficiency. The seat geometry also serves to minimize permanent deformation and compensate for temperature and pressure changes (see Figure 2). No O-ring or metal components are needed for a bubble-tight seal. Adding to the superior sealing capability of the Wafer-Sphere® seat valve, due to its lower permeability, it extends the valve cycle life for a wide range of process applications.

#### Seat Materials: Ball and High-Performance Butterfly Valves

Jamesbury standard ball valves, and high-performance butterfly valves are qualified by both MIL-STDs B and C of the Clean Air Act to ensure emissions of no more than 100 ppm. Comparable valves on the market frequently test up to 1000 ppm and can require additional control and maintenance. Jamesbury Sphere® seat material, in either lugged or wafer designs from 3” to 12”, is its double offset disc and shaft. The disc pulls completely away from the seat material when opened or throttling, eliminating wear.

### Valve Body Integrity

The most dependable seat sealing solution can be totally underestimated by a deficient casing. It is critical to test the valve casing for metallurgical integrity. Jamesbury valves are put through a battery of non-destructive and destructive testing procedures to ensure the sealing integrity of body castings. Besides 100% visual inspection of valve castings, other non-destructive methods include hydro-testing, full dimensional analysis and comparison to ANSI specifications. Destructive procedures such as cutaway analysis, metallurgical screening, porosity measurement and burst testing ensure process engineers can acquire valve solutions with complete confidence in the long-life performance of the valve body.

It’s All About Control and Reliability

The ability of a valve to isolate media where needed and prevent leakage of hazardous materials is at the top of the list when it comes to ensuring process safety, productivity, product quality and, ultimately, profitability.

Jamesbury valves through a combination of excellent seat designs, advanced seat materials, and rigorous material testing are an industry proven solution.