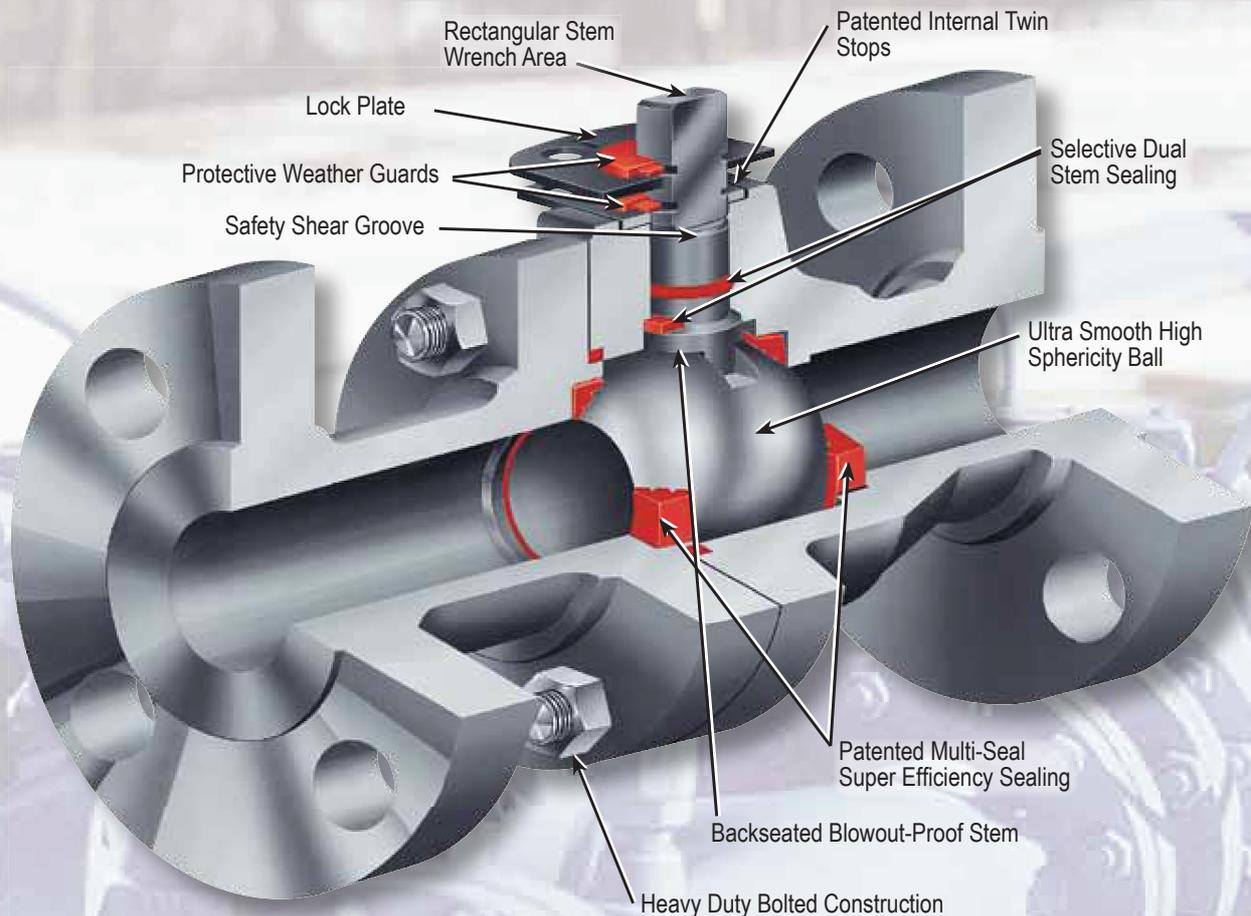


# Ball Valve Cut-A-Way

## The Balon Valve: Totally Advanced



### Unique Sealing Approach

The Balon Ball Valve is the culmination of many years of arduous design and development effort which has been focused on providing a better choice in ball valves. It is a refinement of features proven superior during the use of Balon Ball Valves in thousands of installations since 1965.

The multi-seal seat design has given impetus to the development of an overall valve which embodies several design improvements.

### Backseated Stem

Stems are backseated and blowout proof. And, they provide metal-to-metal backup sealing in the event of a fire. This secondary metal-to-metal sealing is also provided internally behind the seat area.

### Simplified Top Works

Bolts and glands and complicated stem assemblies are totally absent in the Balon valve to assure a simpler, more trouble-free valve.

Hazards associated with bolted stem retainer and packing adjustment screws or bolts have been eliminated. Even the stops are internal and give dual precise stopping support during opening and closing. The stem area is grease-packed and protected by dual plastic weather guards to shield this vital area from external elements thereby eliminating the need for maintenance in the field.

### Precise Manufacturing Control

Balon uses only the highest quality materials to assure the strength and uniformity necessary for applications where valves are used. To further enhance the overall operational superiority of the valve, all balls are machined in-house by Balon's spherical machining process which assures a consistently accurate spherical contour. They are superbly finished and polished. This high integrity finish, along with multi-seal's advanced sealing capability, provides the highest sealing efficiency and substantially reduced operating torque.

We Don't Import Valves, We Make Them. We Don't Export Jobs, We Create Them. **BALON**

# Multi-Seal

## Multi-Seal: The Heart of the Valve

**Notice the grooves.** These grooves loosely receive any grit that might be present when the valve is closed. When the valve is opened, the foreign matter washes harmlessly away, where an ordinary valve seal could have been scored across its entire surface. Balon's seal is good as new.

**Notice the seal rings.** Not just one ring...a series. That's where Multi-Seal gets another big sealing edge over plain seals. The rings assure a concentrated seal, providing a bubble tight seal at high and low pressures, the tighter the seal...the better the shut-off.

**Notice the tapered outer walls.** These tapered walls on the Multi-Seal provide automatic seal-to-ball tensioning and self adjustment to wear. Much longer life and complete trouble-free performance is what you get. That's why you don't need a repair kit.

**How long will the Balon Multi-Seal last?** Our sales records of replacement seats indicate that most Balon valves sold have provided many years of trouble-free performance.

**It has been tested** on water pumped at 1,000 psi operating pressure with shock loading on shutoff up to 1,800 psi. After a million shutoffs, it still sealed bubble tight.



**Ordinary Seals** are damaged during shutoff. As flow is squeezed through fine-line opening, foreign particles are trapped. Complete shutoff grinds them into the seal. Results: premature damage, leakage, valve failure.



**Multi-Seal** receives particles loosely in grooves, to be washed harmlessly away during next opening. Valve seals bubble tight again, through repeated shutoffs.



**Multi-Seal's** series groove design features blunt-edge seal members for superior sealing efficiency. And the grooves form super-tight "fluid seal rings." Each seal member, working with the next one, creates exclusive "staged differential pressure sealing," for the tightest shutoff possible at all pressures.



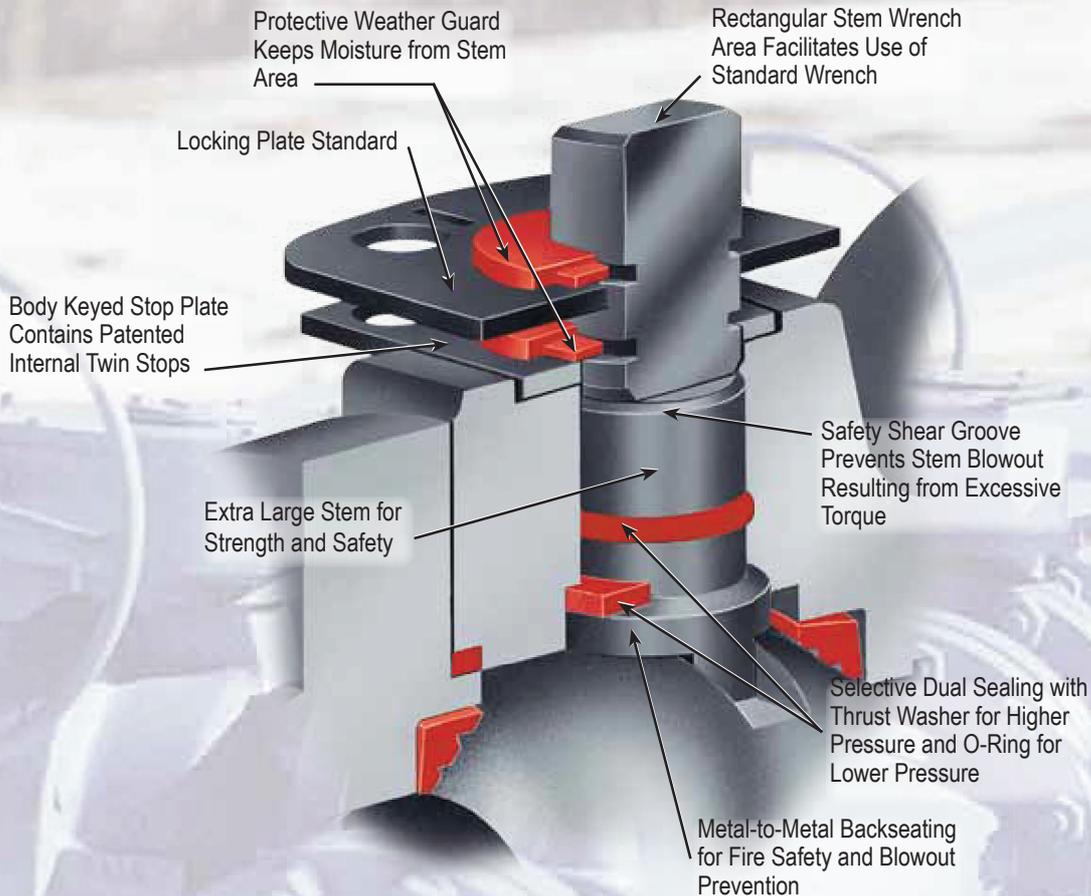
**Multi-Seal** adjusts itself to wear! Outer walls are tapered to permit self-compensation to valve load and seal engagement demand. The design permits thrust loading to realign seat toward optimum sealing engagement.



**The Multi-Seal** design permits selection of seal material best suited to abrasive, high and low pressure applications in toughest services. And the relief pockets formed by the tapered walls, with the series grooving, provide self-compensation for swell to permit easy turning, long-life operation. It takes a better seal to make a better valve...and the best ball valve is a Balon.

## An Advanced Concept in Stem Design

Balon has eliminated the need for grease fittings, lube channels, and regular lubrication.



In keeping with Balon's philosophy of design which envisions simplification and improvement instead of improvement by complication, the Balon stem design solves many problems associated with the common stem design. The overall utility of the ball valve is related in no small way to the basic stem design. Certain standard designs originated early and were followed through by ball valve manufacturers in the years following the advent of the ball valve itself during World War II.

### The Balon Stem: New Solutions For Old Problems

The Balon design represents the result of a total attack on specific problems associated with the outdated design. In the past, it has been a frequent practice to retain stems by use of external bolts or screws. Often these bolted arrangements also provided stem packing adjustment. The problem of leaking stems was amplified because of the complexity of the assembly itself.

The absence of backseating in early designs opened

the way for stem blowout in the event of failure of the retaining assembly or as a result of forcible operation of the valve.

In many former designs, double O-rings were incorporated on the theory that should one O-ring fail to seal, then the second O-ring would perform the sealing job. However, higher pressures trapped between the O-rings often caused high operating torque and other operating problems.

### A Combination of Improvements

As shown here, the Balon design is simple, yet solves these problems. The clean, functional design of the stem assembly represents dramatic improvement in many ways over conventional designs. As is true of the overall Balon approach, the Balon stem does not present just one special modification or design innovation. Rather, it represents the bringing together of interrelated improvements, resulting in total improvement and total superiority.

# Ball Valve Fire Safety

## A More Complete Solution to Fire Safety

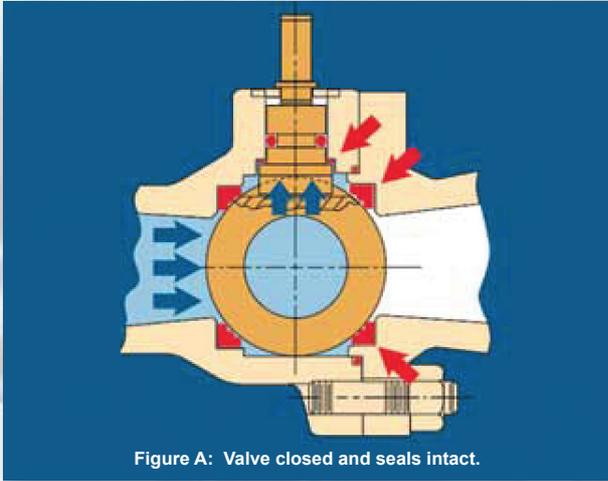


Figure A: Valve closed and seals intact.

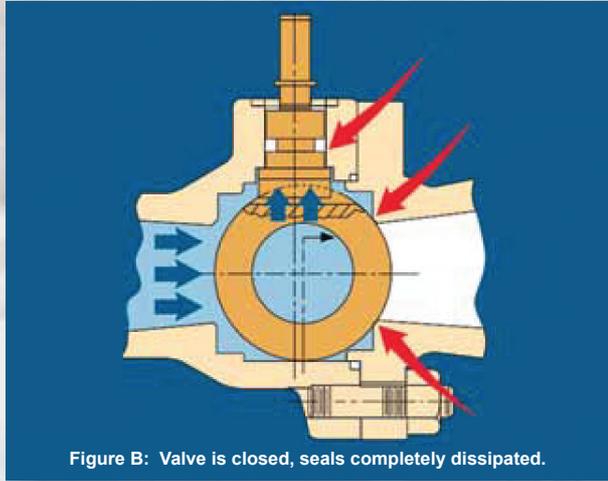


Figure B: Valve is closed, seals completely dissipated.

After many years of development and testing, Balon patented and introduced a ball valve that represented a dramatic turning point in valve safety. It was the first ball valve with the following:

- Backseated stem to prevent stem blowout
- Packless stem gland housing which eliminates stem adjustment mechanisms
- Stem shear groove to assure controlled stem damage above the backseat
- Full Metal spectrum fire safety for metal-to-metal secondary sealing at all potential leak points

Balon then encased these safety improvements in a rugged bolted body assembly capable of withstanding violent thrust loading and line stresses so common in high-pressure line applications.

Fire safety in ball valves has become a major consideration as more and more ball valves have been used in hazardous environments.

The Balon Ball Valve has been designed to provide maximum backup sealing in the event resilient seals are destroyed by heat or fire.

### Controlled Spacing

The interior components of the valve, with seals intact, can be seen in Figure "A". In the closed position the ball is held off of the secondary metal seat position.

The seat and seat pocket are made oversize in radial dimension, allowing close spacing of the ball and metal seat provision. In operation, with prime seals in place, this controlled spacing prevents damage to the surface finish of the ball.

It can also be seen that the stem is backseated, and with seals in place the primary stem seal holds the stem off of the metal shoulder machined in the valve body.

### Secondary Stem Seal

In figure "B", the seals have been fully dissipated, the ball has moved downstream onto the secondary metal seat, and the stem has been checked, metal-to-metal, against the inner shoulder.

As can be seen, the stem is free to move upward when subjected to a slight amount of pressure, onto the machined metal inner shoulder, thus substantially restricting any flow past the stem into the atmosphere.

### Straight Ahead Ball Movement

The stem tongue is keyed into a linear milled slot, straight and perpendicular to the bore of the valve. In the closed position, the ball is free to move downstream onto the secondary metal seating, functioning at that moment as a simple ball check valve.

The ball itself is confined in the body with just enough vertical and horizontal clearance to assure free and easy operation. This keeps the ball in uniform alignment so that ball movement onto backseating - should it become necessary - is consistently on a straight course, without deflection up, down or sideways.

The valve may be positioned in either vertical or horizontal installations, and retain its secondary metal-to-metal sealing capability.

These very simple provisions are intended to provide full operational safety in our valves. Every attempt has been made in our design to produce a valve that is safe and affordable.

**Balon Ball Valves have been successfully tested by an independent laboratory in accordance with API Standard 6FA "Fire Test for Resilient Seated Ball Valves". Results of this testing are available on request from Balon's headquarters.**