



ANATOMY OF A HIGH PERFORMANCE BALL VALVE

IN PROCESS CONTROL APPLICATIONS, QUALITY TRANSLATES TO...

SAFETY • VALUE • PRODUCTIVITY



With a wide selection of valve products available to today's process engineer, making the best technical decision can be challenging. Typical questions might be:

- *Will the valve be reliable?*
- *How do I measure safety and value?*
- *Do the materials satisfy my long term expectations for performance?*

High performance ball valves represent the state of the art in valve technology by offering a level of quality and performance not found in "light duty" designs. This means that in severe service, critical systems, high pressure and fire safe applications or for hazardous or corrosive fluids these valves may be chosen, installed and depended upon with the highest degree of confidence.

What to look for in High Performance Ball Valve designs...

✓ **Cost of Ownership -**

This begins with making the best selection for your application and continues with the cost of installation, ease of maintenance and availability of optional features that correctly suit the process.

✓ **Pressure/Temperature -**

High Performance ball valves offer seats, seals and body materials to satisfy a wide range of fluids, pressures, temperatures and services. Exotic materials like Hastelloy, Alloy-20 or Monel are common options. **SupraLon** seats are well suited for Steam or Thermal Fluid systems.

✓ **Live-Loaded Stem Seals -**

Particularly in thermal cycling or automated valves, live-loaded stem packing systems ensure long, trouble-free life in the stem seal area which is a common failure point in "light duty" valves.

✓ **Standards -**

ANSI, ASME and API are examples of design standards that intend to ensure performance and safety in pressure containing systems, like valves. Look for these standards when selecting valves for plant-wide reliability.

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COMPARING HIGH-PERFORMANCE VALVES WITH LIGHT DUTY (3-PIECE BALL VALVES)

| | HIGH PERFORMANCE | LIGHT DUTY VALVES |
|--------------------------------|--------------------|-------------------|
| Size Range | 1/4" to 4" | 1/4" to 4" |
| End Connections | | |
| NPT | Y | Y |
| SW | Y | Y |
| BW | Y | O |
| | All Pipe Schedules | |
| Flanged | Y | O |
| Alloys | 316L Grade | 300 Series SS |
| | Hastelloy | O |
| | Alloy-20 | O |
| | Bar Stock | O |
| | Duplex | O |
| Seats | | |
| TFM | Y | Y |
| PEEK | Y | O |
| UHMWPE | Y | O |
| Delrin | Y | O |
| SupraLon | Y | O |
| Live-Loaded Stem Seals | Y | Optional |
| May be Used in Control Service | Y | N |
| Temperature Ratings up to: | 650°F | 300°F |
| Pressure Rating up to: | 3000 PSI | 1000 WOG |



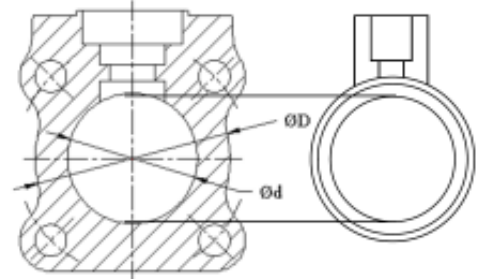
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TECHNICALLY SPEAKING, THE QUALITY IS IN THE DETAILS

INDUSTRY STANDARDS

Industry Standards help ensure that valves, which are pressure vessels, meet the pressure, temperature and piping system performance and compatibility.

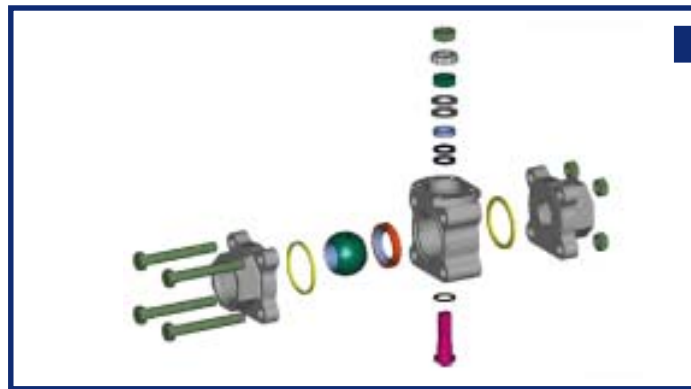
Wall thickness on High Performance 3-piece ball valves can be twice that of light duty valves. Pressure containment, corrosion and erosion should be considered.



High Performance

Light Duty

Note the difference in wall thickness



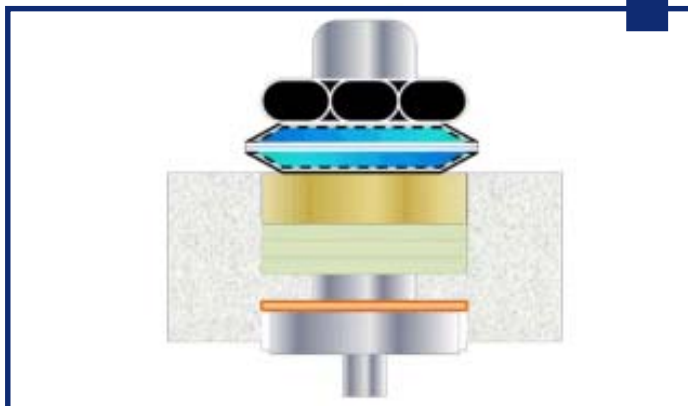
EASE OF USE & MAINTENANCE

Quality by Design

Quality components means long life, ease of use and reliable up-time in process plants.

Machining- Machined parts are produced to the highest caliber resulting in reduced wear, proper fit and low friction interface between seats, stem and seals.

LIVE-LOADED STEM DESIGN



Seal Design plays a key role in pressure containment for ball valves.

Quarter-turn rotation combined with a live-loaded stem packing system utilizing alloy Bellville "spring" washers ensures sealing under high cycling, thermal cycling and for automated valves.



IN-LINE WELDABILITY

Fully Encapsulated Body Seal - This design feature not only assures a tight body seal under varying loads & thermal cycling, it also allows the valve to be welded into a socket or butt weld piping scheme without the need for valve disassembly.

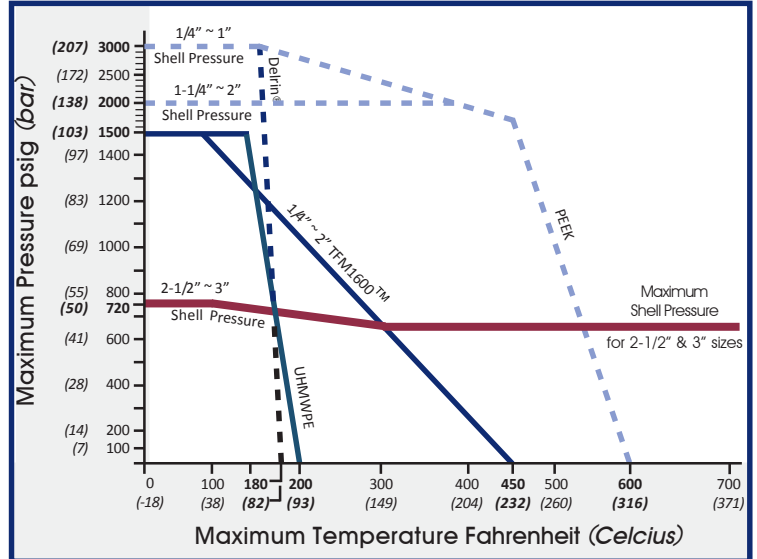
This is particularly valuable for field personnel, labor time and, with in-line weldability, the potential loss of parts or mis-assembly is avoided.

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ROBUST DESIGN & WIDE RANGE OF OPTIONS FOR PLANT-WIDE OPERATION

SEAT SELECTION FOR HIGH PERFORMANCE VALVE DESIGNS

- A - TFM
- T - VIRGIN TEFLON (See A-TFM)
- R - REINFORCED TEFLON
- D - DELRIN
- S - SupraLon
- U - Ultra High Molecular Weight Polyethylene
- K - PEEK



SECONDARY CONTAINMENT

High Performance ball valves are suited for *plant-wide* use. In severe fluid service they may be fitted with a bonnet that contains fugitive emissions to meet EPA guidelines. The extended bonnet is also ideal for insulated steam or thermal fluid lines.



AUTOMATED VALVE PACKAGES

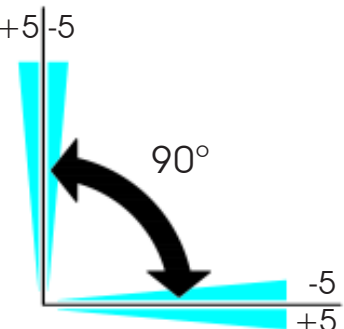
The robust design offers automated valve configurations to satisfy "On/Off" and modulating operations.

Accessories include: Switches, Positioners, Pilot Valves, AS-I, DeviceNet and other control accessories.



AERO2 BI-DIRECTIONAL STROKE ADJUSTMENT

*aero*² actuators feature bi-directional pinion travel stops. These stops allow for true $\pm 5^\circ$ for valve travel adjustment to ensure precise positioning in all flow control services. The *aero*² travel stops are designed to absorb the maximum rated torque of the actuator and the maximum impact loads associated with the recommended stroke speed.



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