



TRIFORCE TECHNICAL BENEFITS

valves and actuators

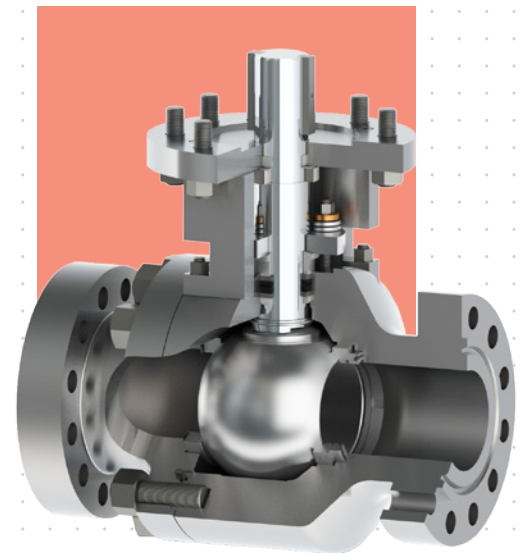
introduction

The **TriForce** - High Performance Metal-Floating Ball Valves - have been developed to operate in the most severe services, while ensuring operational integrity for the most critical applications.

These high performance ball valves can be operated with the absolute guarantee of a tight seal, even in cases where fluids solidify or crystallize in the body cavity, because the contact surfaces between the ball and seats are lapped together to form a perfect match.

triforce valve DESIGN FEATURES

- ▶ Long life in severe applications and frequent operation
- ▶ Robust Blowout-proof stem
- ▶ Bubble tight during standard test as per API 6D / API 598 / ISO 5208
- ▶ ASME 150 – 2500 Class (API 6A Pressure Ratings and requirements available upon request)
- ▶ 1/2 – 24 inch (larger sizes upon request)
- ▶ High performance packing, seals and gasket materials
- ▶ Wide variety of material selection
- ▶ Special bore sizes and all End Connections Available
- ▶ Manual or automated operation

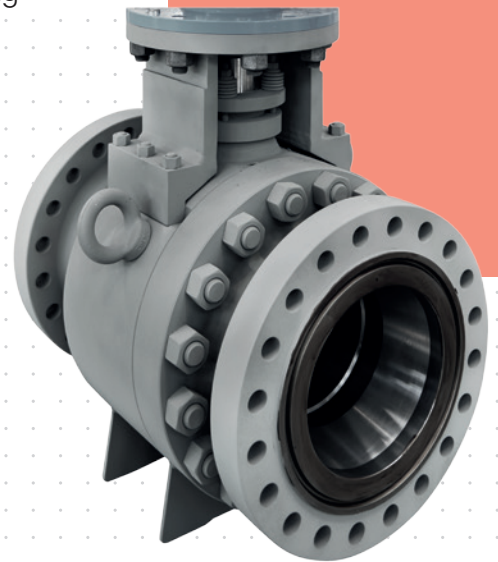


uses of TRIFORCE

TriForce has been developed to overcome operational limitations exhibited by either trunnion mounted and rising stem ball valves designs, in harsh services.

Triforce is recommended for use in:

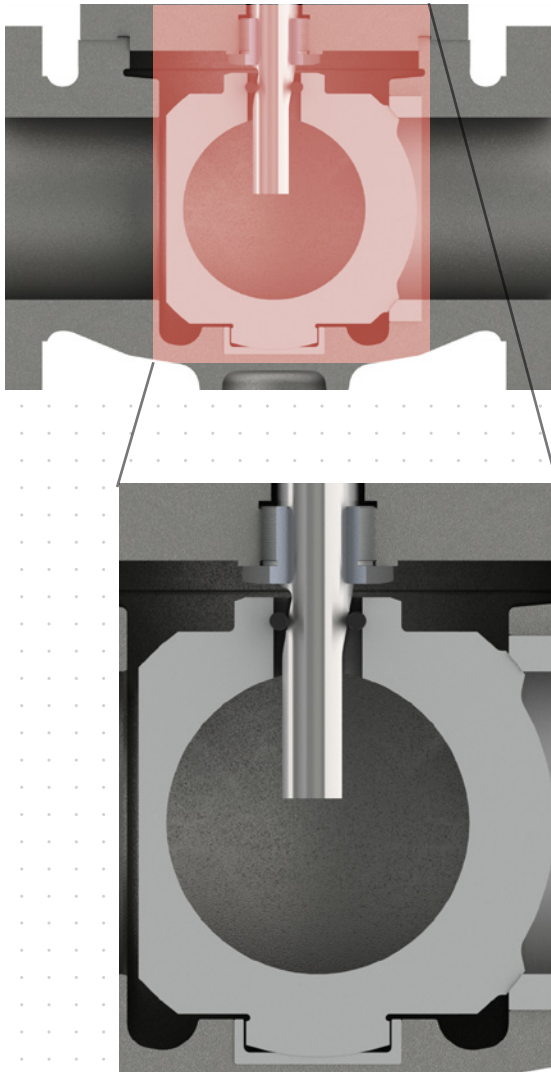
- ▶ Molecular Sieve Service
- ▶ Hot Oil
- ▶ Oil Sands
- ▶ Mining Applications
- ▶ De-Coking Applications
- ▶ Emergency Shutdown
- ▶ Coal gasification



ball SUPPORT

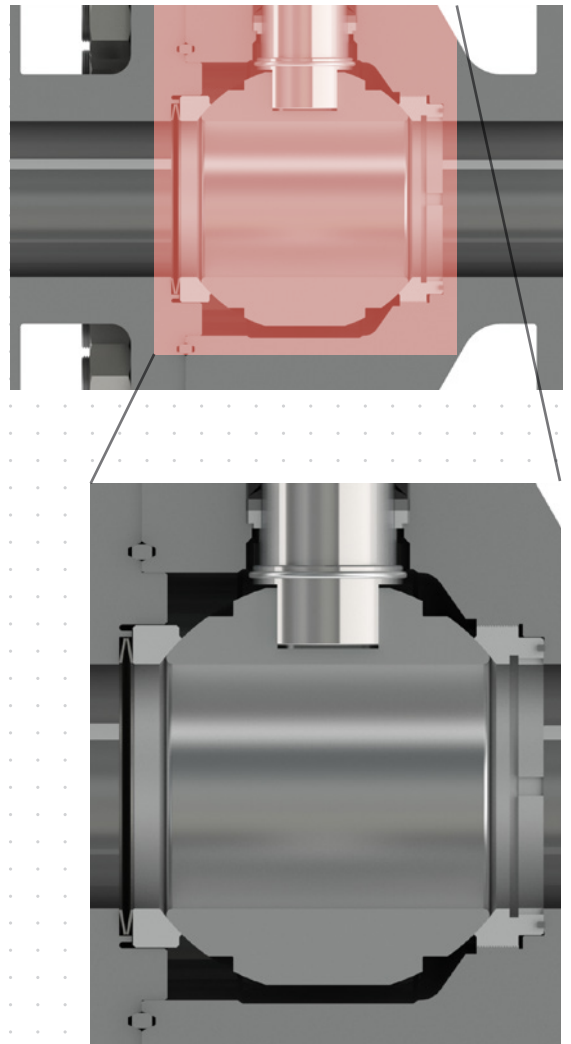
RISING STEM BALL VALVE

Trunnions & bearings are prone to deterioration of bearing surfaces because of hard particles and fines carried by the fluid. Bearings also exhibit limited resistance to high temperature.



TRIFORCE

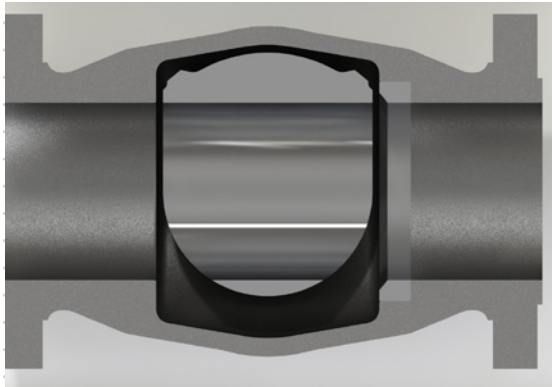
Ball is supported directly by seat rings: trunnion bearings are not required, thus all problems inherent to these critical elements are eliminated.



through conduit DESIGN

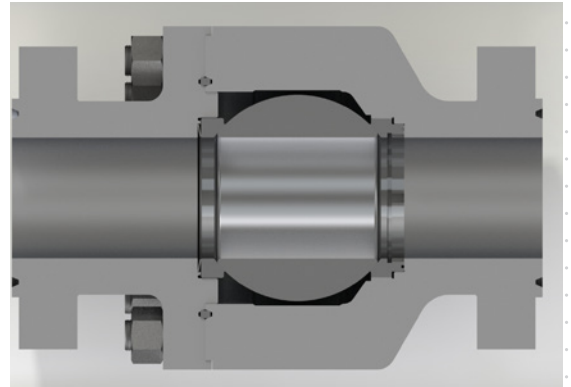
RISING STEM BALL VALVE

Not a real 'through conduit' design: contact between seat and ball is lost once the ball rotation starts, dirt and fines are normally conveyed and trapped in the body cavity.



TRIFORCE

Real 'through conduit' design: contact surfaces between ball and seats are lapped together in order to match perfectly. During operation, no foreign matter can be trapped and/or forced between seat and ball (wiping action removes any foreign matter during ball rotation).



seat-to-ball SEALING SYSTEM

RISING STEM BALL VALVE

Seat seal is achieved forcing via a cam mechanism, the ball against the seat. The mechanism is fully exposed to fluid, thus erosion and growth of foreign matter can dramatically increase torques or get the valve stuck in an inoperable condition. In such a situation any thermal gradient may generate unacceptable contact stresses.

TRIFORCE

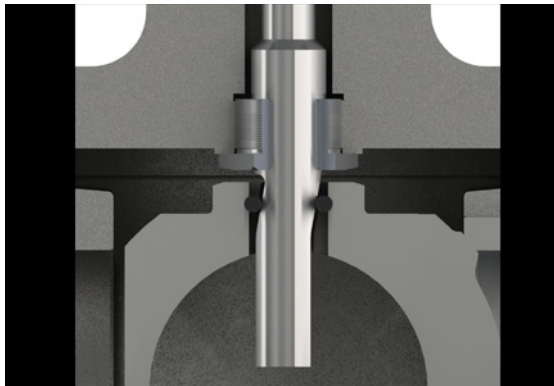
Ball is supported directly by seat rings and is operated with a full guarantee of tight seal, even in case of fluid solidification or crystallization in the body cavity. Upstream seat withstands thermal transients accommodating any differential expansion between body and valve internal components.

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reliability

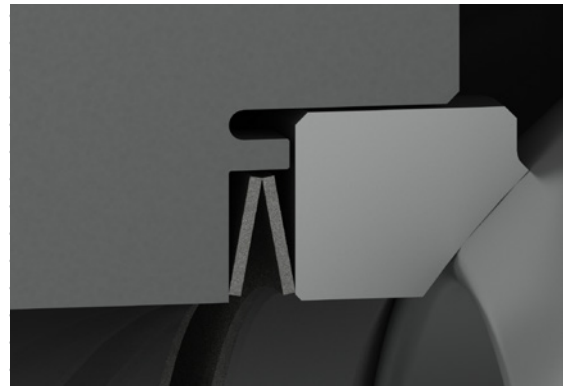
RISING STEM BALL VALVE

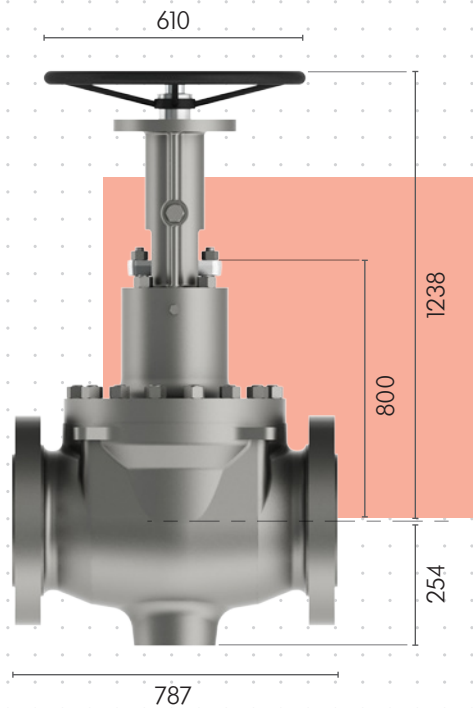
The cam mechanism is easily prone to wear, high rate of maintenance is required to guarantee the valve functionality.



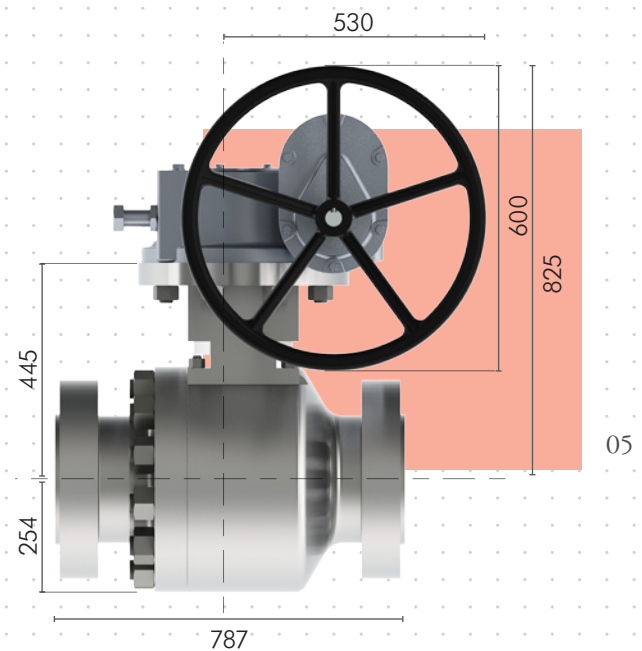
TRIFORCE

The robust design provides high operational efficiency and minimize maintenance.



through conduit
DESIGN

- ▶ Linear operation
- ▶ Long closing /opening time
- ▶ Unidirectional valve
- ▶ Small contact between ball and stem
- ▶ High wear, frequent maintenance
- ▶ Galling problem with solids



- ▶ Quarter turn Operation
- ▶ Fast stroking
- ▶ Bidirectional sealing
- ▶ Robust stem/ball Joint
- ▶ Low wear, longer service life
- ▶ Suitable for heavy solid service/ fine particles



MANUFACTURING PLANT

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