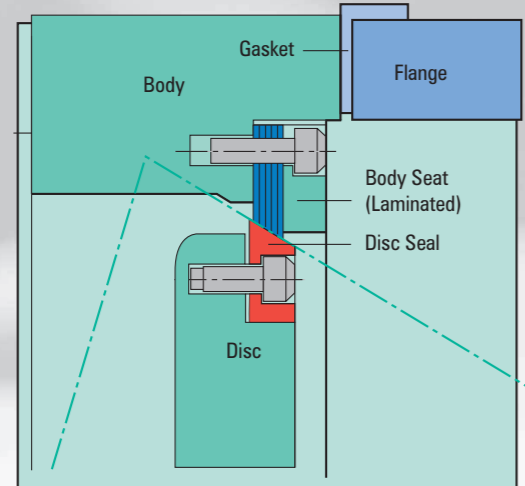
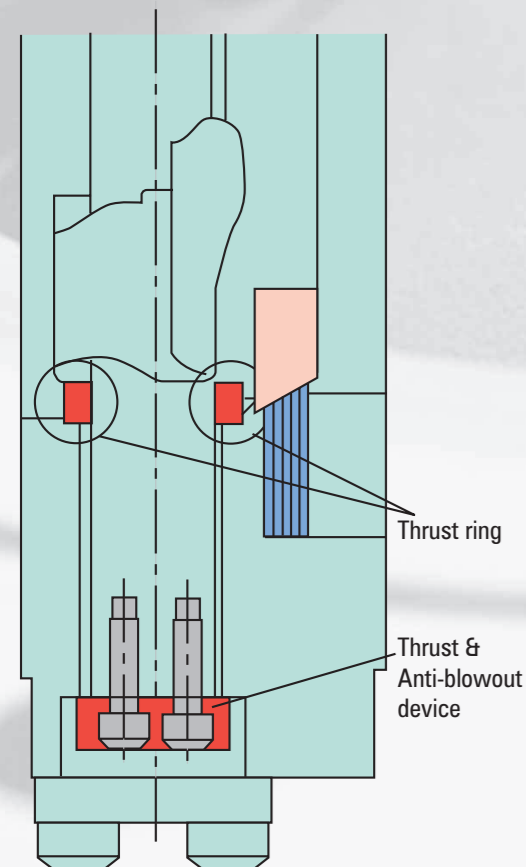


Features of the Tritec Valve

- Triple offset and ellipsoidal sealing geometry
- Bi-directional zero leakage
- Inherently firesafe
- Developed Geometry results in:
 - Zero Seat/Seal friction
 - Low Torques
 - Extended Service Life
 - Continued Seal through Thermal Cycling
 - Torque Seating
- Excellent flow and throttling characteristics covering services from Cryogenic to high temperature
- Excellent control of Fugitive Emission by virtue of Rotary stem movement and advanced packing materials
 - Less than 10ppm on Fugitive Emission Test to cover EPA21
- Other tests available on request
- Firesafe to BS6755 part 2 / API 6FA and API Std 607 4th Edition
- Available Fully Rated to Class 1500Lb
- Fully rated for end of line duty
- Standard materials conform to NACE, all exotic materials also available.
- Laminated seat is mounted in the body, removing it from the erosive effects of the flowing media



- Seat is self centering "floating" design
- Both Seat and Seal are field replaceable without special tools.
- Unique elliptical bolting pattern allows foolproof replacement of seat and seal
- Gasket Sealing Face is completely uninterrupted by fixings
- Suitable for use with Spiral Wound gaskets and all flange finishes including RTJ
- Antiblowout device on shaft
- ISO mounting flange allows easy fitting and changing of operators
- Operator is bolted and doweled to prevent radial movement and subsequent loss of seating torque.
- Body counterbore and seat bolting arranged elliptically to ensure equal support, gasket land and gasket loading all around the elliptical edge of the laminated body seat.
- Inboard AND outboard thrust mechanisms prevent decentralising of disc, even under high temperature and line pressure.
- By eliminating seat-seal friction on seating, Tritec removes the "Blind Zone" and increases the rangeability or controllable range to the full 90° of movement. The rotation geometry and inboard bearing design reduce the effect of dynamic torque and mechanical noise vibration, increasing midrange control accuracy. Cavitation and Noise reducers are available to complement the Tritec valve under high pressure drop process situations.



TOMOE valves can be found in operation in a vast range of industries worldwide, both on-shore and off-shore, providing unsurpassed levels of leak tightness and wear resistance and making a valuable contribution to overall process efficiency.

- Water Treatment
- Chemical Processing
- Food & Drink
- Sugar Processing
- Oil & Gas
- Offshore
- Petrochemical
- HVAC
- Power Generation
- LNG
- Iron & Steel
- Marine
- Cement
- Powder Handling

Tomoe Valve Limited

Estuary Road, Queensway Meadow Industrial estate,
Newport, South Wales, United Kingdom
Tel: +44 (0) 1633 636800
Fax: +44 (0) 1633 636801
E-mail: sales@tomoe.co.uk

Tritec Product Division

Clearwater Road, Queensway Meadows Ind. Est.
Newport, Gwent, NP19 4ST
Tel: +44 (0) 1633 274707
Fax: +44 (0) 1633 292605
E-mail: sales@tomoe.co.uk

Tomoe Valve Co. Ltd.

3-11-11 Shinmachi, Nishi-Ku,
Osaka 550-0013, Japan
Tel: +81 6 6110 2101/02/03
Fax: +81 6 6110 2105/2106

Tomoe Valve S.E.A. PTE Ltd.

No. 3, Chin Bee Avenue, Singapore 619 928
Tel: +65 6899 5060
Fax: +65 6899 5061

Tomoe Valve Corporation.

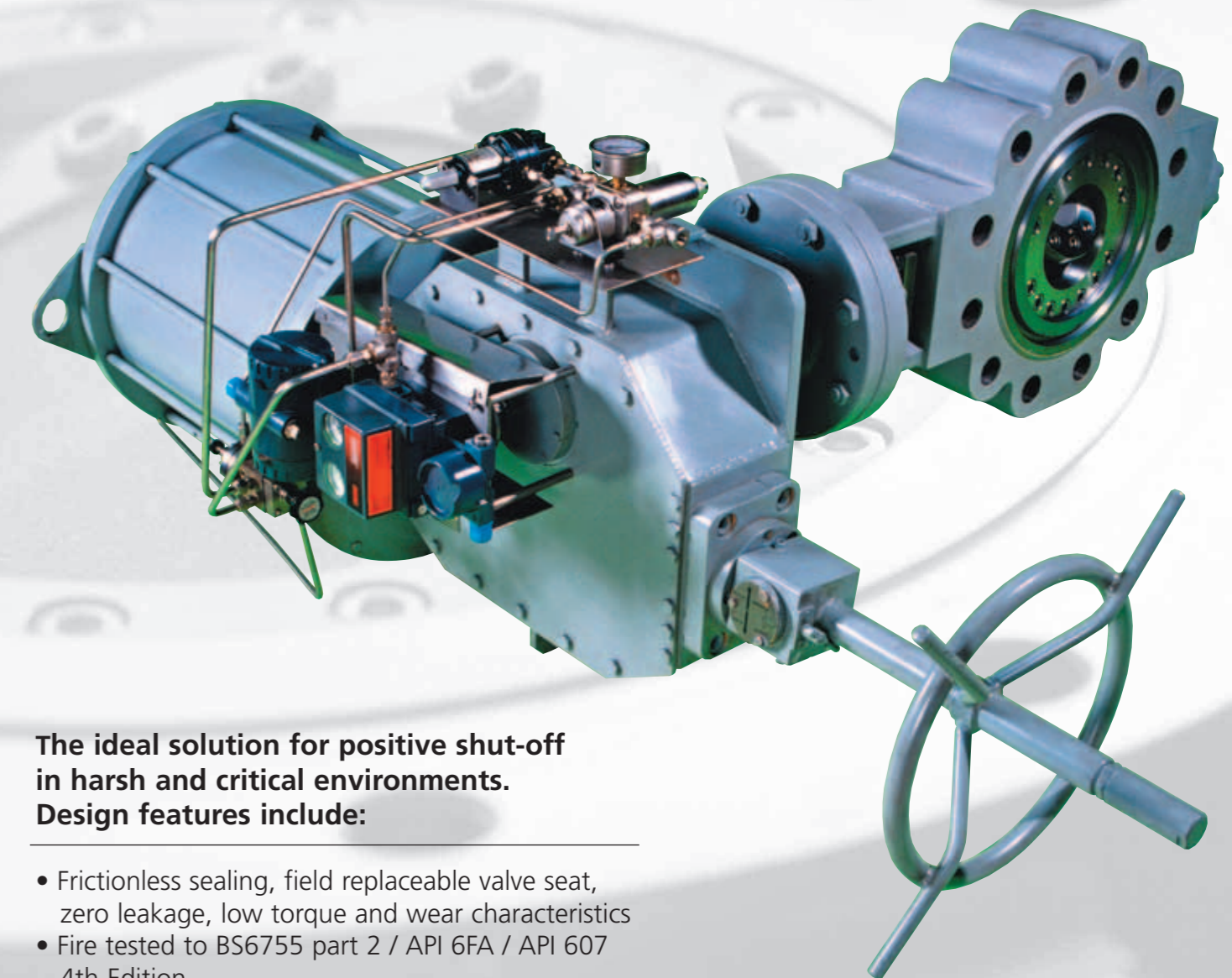
600, Rockmead Drive, Suite 115, Kingwood,
Houston, Texas 77339
Tel: (001) 281 358 7571
Fax: (001) 281 358 7861
www.tomoevalveusa.com

TOMOE
www.tomoeurope.co.uk

TOMOE EXCELLENCE IN HYDRODYNAMICS

Triple Offset Process Valves - 150-2500lb range

150 / 300 / 600 / 900
1500 / 2500lb Range



The ideal solution for positive shut-off in harsh and critical environments.
Design features include:

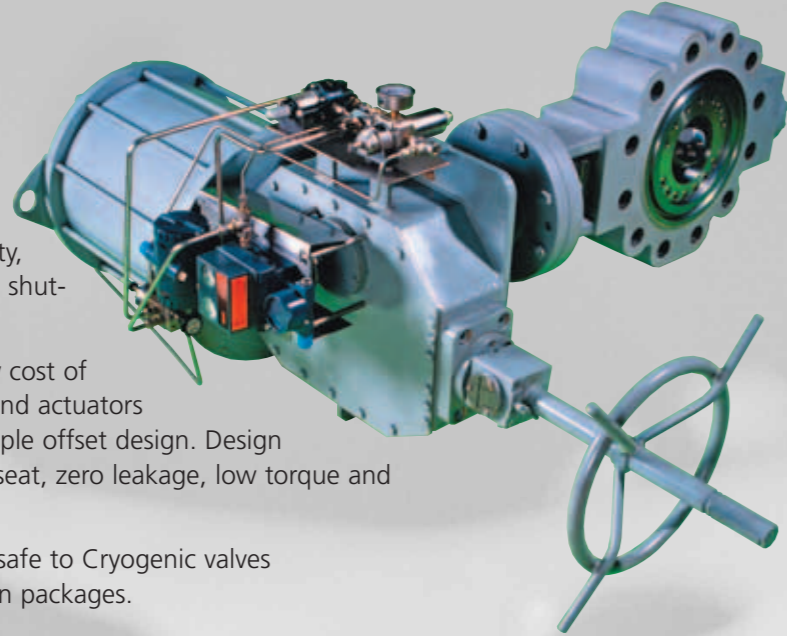
- Frictionless sealing, field replaceable valve seat, zero leakage, low torque and wear characteristics
- Fire tested to BS6755 part 2 / API 6FA / API 607 4th Edition
- Available fully rated to Class 1500lb
- Fully rated for end of line duty
- Standard materials conform to NACE, all exotic materials also available
- Comprehensive range of body patterns and actuation packages

www.tomoeurope.co.uk

Internationally recognised for product innovation and quality, TRITEC triple offset valves are the ideal solution for positive shut-off in harsh and critical environments.

Designed for absolute reliability, easy maintenance and low cost of ownership, the range of standard or custom-made valves and actuators incorporates the latest valve and materials technology in triple offset design. Design features include frictionless sealing, field replaceable valve seat, zero leakage, low torque and wear characteristics.

The extensive range comprises on/off to control valves, firesafe to Cryogenic valves with a comprehensive range of body patterns and actuation packages.



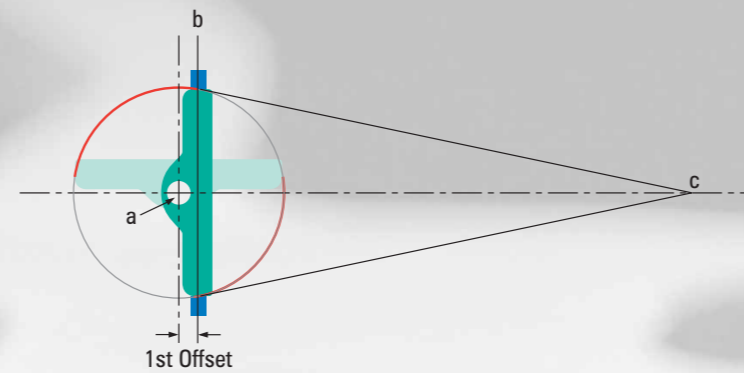
Standard Specifications

Design	API 609, BS 5155, ANSI B16.34, ASME SEC VII
Valve sizes	2" (50mm)~60" (1500mm) for larger sizes please contact the sales office.
Pressure Classes	ANSI 150 to Class 2500Lb, PN 6 to PN 400
Body Styles	Lugged / Wafer Flangeless / Double Flanged / Butt Weld End
Flange Accommodation	ANSI B16.5: 2" - 24" ANSI B16.47 Series A&B: 26" - 60" JIS 10K, 20K, 30K. MSS, API, BS, DIN, PN, ISO also available on request.
Face to Face Dimensions	LUG and WAFER Type API Std 609 Table 2: 3" - 24" API 609 Std Table 1: 30", 36", 42", 48" ISO 5752 Wafer Short: 28", 32", 40" DOUBLE FLANGED Type ISO 5752/BS 5155 Double Flange Short ISO 5752 Gate Valve Short (Basic series 3) on request. ANSI B16.10
Pressure Temperature Ratings	ASME/ANSI B16.34: for Steel AMSE/ANSI B16.24: for Bronze Working Temperature Range as Standard: -29°C (-20°F) to 538°C (1000°F) With selection of suitable materials -100°C (-148°F) to +700°C (1292°F) For Cryogenic range (temperature to -196°C (-320°F), please contact the sales office.
Pressure Tests	Shell Test, Seat Test API Std 598, ANSI B16.34. Seat Leakage Rate API Std 598, ISO 5208 Rate A, ANSI B16.104 (ANSI/FCI 70-2) Class VI
Firesafe	Certified Firesafe to BS 6755 Part 2/API 607 4th Ed.
Marking	API Std 609 MSS SP-25
Operators	Manual, Electric, Pneumatic, Hydraulic

Tracing the evolution of Triple Offset design

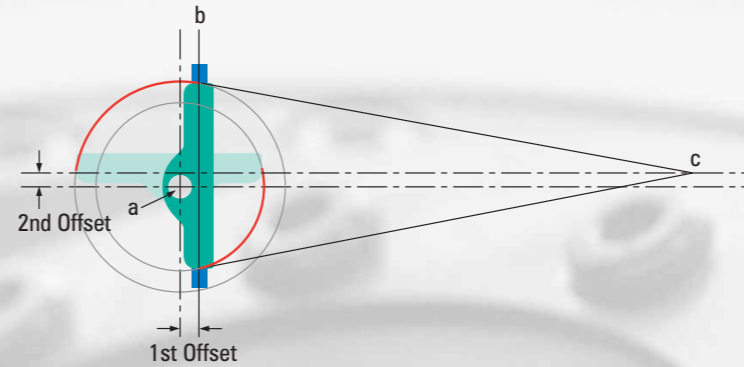
Single Offset

The centre of rotation is moved from the centreline of the valve body. The seat and seal design remains conical and on centre. This design again relies on a frictional, interference seal, but the length of rotation over which this friction occurs is reduced, allowing a larger range of process resistant seat materials to be used. However these materials must be relatively soft or highly elastic to prevent "jamming".



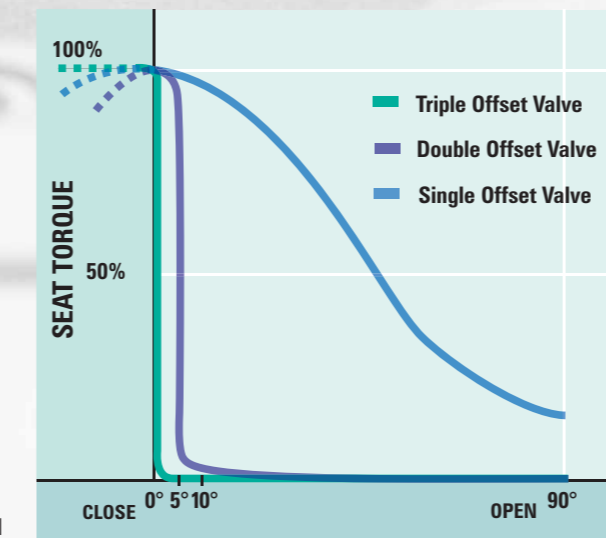
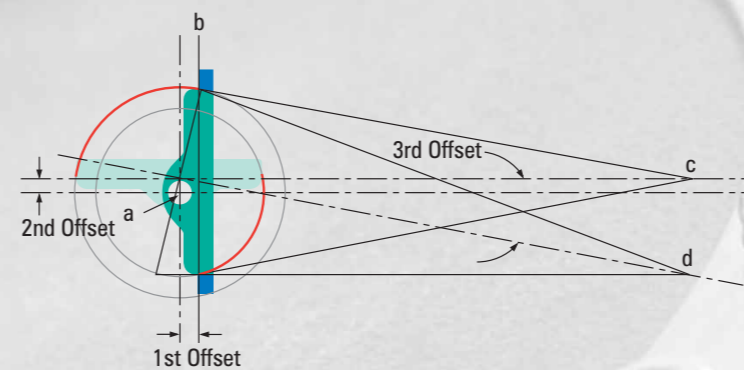
Double Offset

The centre of rotation is moved back from the centreline of the valve disc. The seat and seal are designed conically and on centre. This design relies on a frictional, interference seal and so is applicable only to soft seated valves.



Triple Offset

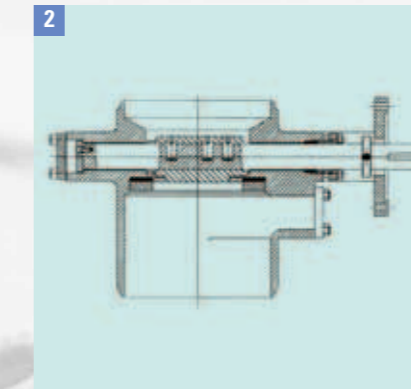
The centreline of the cone is rotated away from the valve centreline resulting in an ellipsoidal profile and providing the third offset. With this geometry, seat seal interference is completely eliminated ensuring long sealing life. The result is a torque seated, process pressure aided FRICTIONLESS seal. The geometry allows the body seat to be used as the closed limit stop, aiding operator adjustment. The Triple Offset design is ideally suited to metal seated valves providing bubble-tight performance on high temperature, high pressure and firesafe applications.



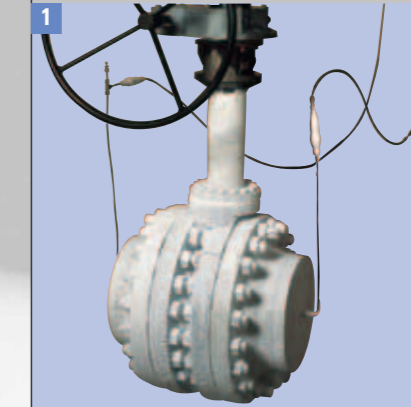
OFFSET VALVE-DISC/SEAT FRICTION

design options

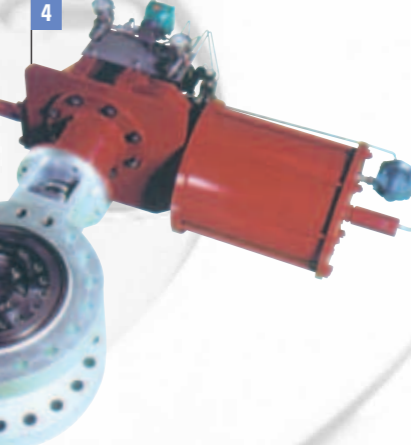
1. CRYSEAL CRYOGENIC VALVES
Temperatures to -196°C.
Designed, tested and certified to BS6364 1988.



4. CONTROL VALVES
Frictionless seating means increased rangeability, allowing the Tritec valve to perform in both control and isolation application.

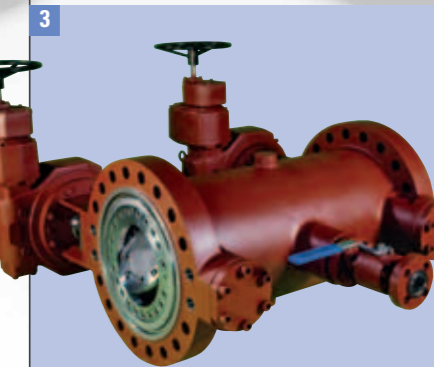
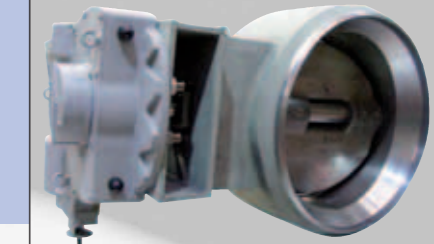


2. TOP ENTRY VALVES
Allowing complete maintainability on valves which are welded into line. Available on standard and cryogenic ranges

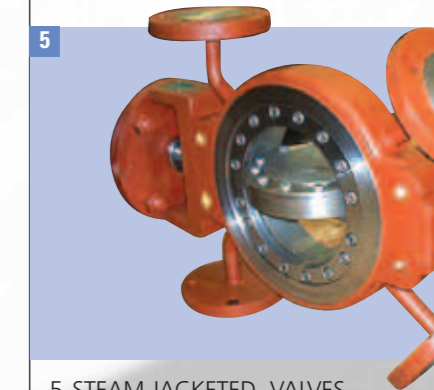


6. VALVES TO REDUCE FUGITIVE EMISSION
Designed to reduce fugitive emission, testing is available to all international standards plus customer specific requirements.

6. WELD ENDED VALVES
For application where accessibility and safety issues are paramount. Combined with the Tomoe top end design complete maintainability is allowed



3. DOUBLE BLOCK AND BLEED VALVES
To allow verifiable maintainable shut-off in critical isolation applications. Firetested to BS 6755 part 2/API16FA & AP1607 4th edition.



5. STEAM JACKETED VALVES
To maintain process temperatures ensuring media remains fluid. Disc and shaft steam tracing as an option.

TRITEC APPROVALS

- Quality System: ISO 9001:2000 Accredited by LRQA JIS Q 9001:2000.
- Pressure Equipment Directive (PED) 97/23/EC.
- ATEX 94/9/EC BASEEFA Ref: 04ATEX0230DR.
- Firetest to BS6755/API 6FA and API 607 4th Edition.
- GHOST Approval for the Russian Market.
- API 591 Refinery Acceptance Testing.
- Fugitive Emissions to EPA2 1, TA LUFT.
- Design code approvals by ASME, LLOYDS, DNV and STOOMWESEN.
- Cryogenic test certification to BS6364. Class150 and Class300 Valves.
- Firetest to DOT 54 Appendix D.
- Lloyds Approval for Shipside use (Double Flanged Body Pattern).
- High Pressure Gas Testing Approvals : Class 600 and Class 900 Valves.
- NACE Material Certification.