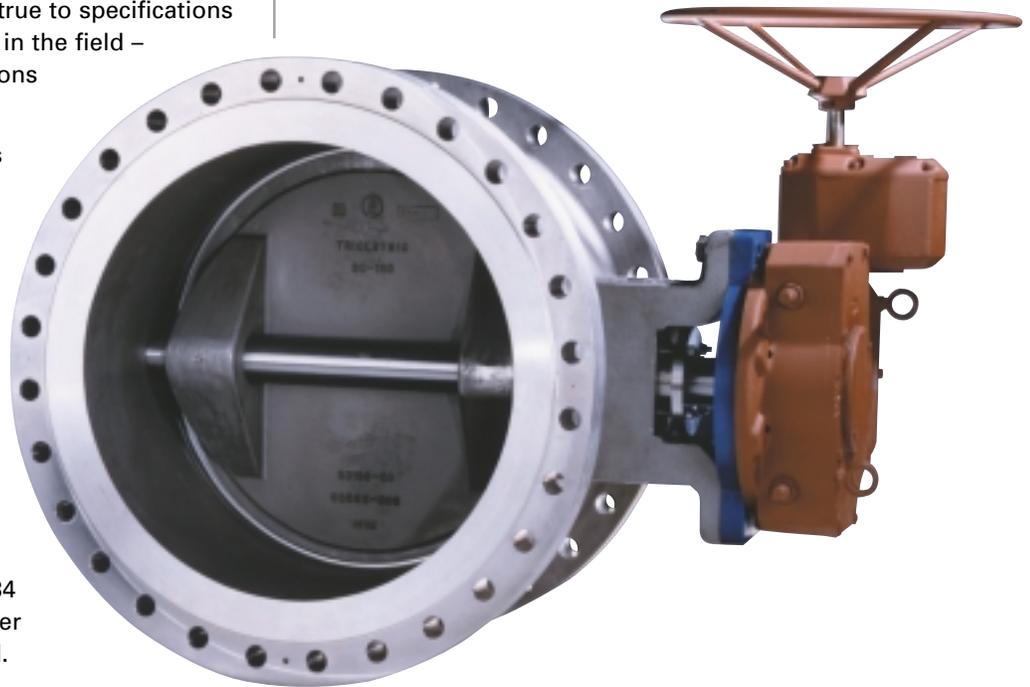


TRICENTRIC® METAL SEATED BUTTERFLY VALVE

Today's demanding projects require a quality valve that is reliable, cost-effective, true to specifications and most importantly, proven in the field – over a wide range of applications and conditions.

Throughout the world, today's engineers, as well as project and maintenance managers, specify TRICENTRIC® Valves for their Power, Processing, Refinery and most critical applications worldwide.

Atwood & Morrill designs, manufactures and services engineered, high-specification valves in accordance with a comprehensive quality assurance program. The design standard is ANSI B16.34 with international and customer standards invoked as required.



TRICENTRIC® GUARANTEES A "TIGHT" SEAL



Dye Test showing no wear or rubbing

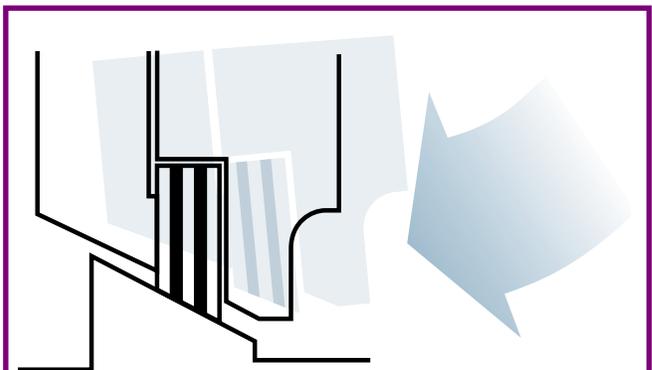
The *Prussian Blue Seat Test* clearly demonstrates TRICENTRIC®'s superior, leak-tight, positive seal. Dye applied to the disc produces seating line contacts only – with absolutely no rubbing or wear. The non-jamming seating of TRICENTRIC® valves remains bubble tight after 50,000 cycles, as tests have proven. Specifically designed to never rub or gall, TRICENTRIC® Valves actually remain bubble tight for more than 50,000 cycles.

TRIPLE OFFSET

The shaft is offset from the disc centerline

The shaft is located behind the disc mounted seal element

The cone axis is offset from the disc centerline



Seat contact does not occur until the disc is seated closed.

On opening the seal lifts cleanly off the seat at all points allowing long life and quality sealing for many cycles.

TRICENTRIC® APPLICATIONS

PULP & PAPER MILLS

Isolation and check valves for steam
Alcohol reduction process applications
Green, Red and Black liquors
Oxygen systems
Boiler water
Lime mud slurries
Stock solutions

REFINERIES

Fuel oil storage isolation valves
Steam supply stop and control valves
Sulphur condenser switch valves
Flare gas hydrogen and sour gas control, isolation or check valves
Refinery Desulphurization cooling water
Dirty hot cracking gas stop and control
Fluidized catalytic cracker check, stop and control valves

POWER PLANTS

Pump isolation and check valves
Condenser cooling
Condensate pump and extraction steam isolation and check valves
High temperature, quarter turn valves
Heat exchanger, suppression system and condenser cooling water isolation valves
Hydraulic cushion and positive shut off check valves
Fuel gas supply and isolation lines
Steam Turbine generation stop and control valves
TRICENTRIC® Valves for nuclear power plants meet ASME III, 10CFR50 Appx. B and ANSI B31.1 as required.

STEEL MILLS

Blast furnace gas isolation control and check valves
Coke battery stop valves
Recirculation pump discharge check valves
Compressor discharge check valves
Expander inlet and bypass control valves

HYDROCARBON PROCESSING

Hydrogen gas
Brine
Propylene
Ethylene
CO₂ Vapor
Liquid or Gaseous oxygen
Steam
Cooling water
Power assisted check valves for Compressor or Propylene discharge lines
Emergency closure valves to isolate in 1 second or less
Flare inlet control and manifold isolation

SPECIAL APPLICATIONS AND OPTIONS

Special body, shaft and disc materials available
Geothermal plant applications
Molten sulphur
CO₂ recovery
Steam jackets
Large sizes up to 96"
Propane gas
"Man Safe" valves
NACE trim materials

TRICENTRIC® TESTING

TRICENTRIC® VALVES have surpassed the most stringent tests for many worldwide industries including Chemical, Petroleum, Power, Pulp/Paper, Steel, Nuclear and many others

FIRE TESTED

TRICENTRIC® Valves meet or exceed API 607, Fourth Addition.

SULFUR TESTED

TRICENTRIC® breaks through solidified sulphur in seating and bearing areas with no seal damage nor interruption of service. Make cheater bars obsolete.

CRYOGENIC TESTED

TRICENTRIC® Valves have proven seal reliability for liquid oxygen, liquid nitrogen, liquid and natural gas services as required by NASA, aerospace industry and oil field recovery services.

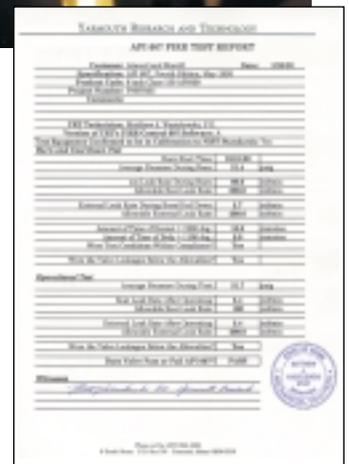
In an independent laboratory test a TRICENTRIC® Valve measured zero leakage with Helium. After more than three hours submerged in liquid Nitrogen at -321 deg F and 145 psig the TRICENTRIC® Valve then met all specification requirements!



Cryogenic Testing



Fire Testing



TRICENTRIC® ADVANTAGES

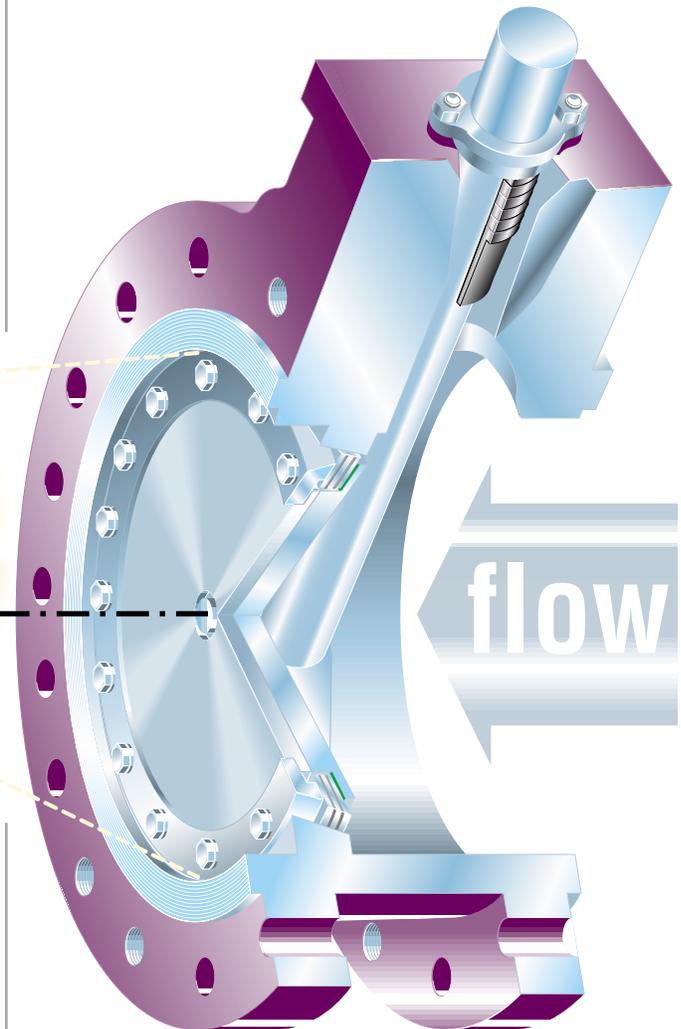
A tight metal-to-metal sealing system

TRICENTRIC® geometry prevents seat or seal wear by eliminating interference between body seat and disc seal.

Torque seated, self compensating for temperature variances.

Seal stack in disc is wide stainless steel laminate.

The shaft is keyed to the disc and operator for assured reliability.



Gasket surface is uninterrupted by seat/seal retainer bolt holes.

Meets API-609 and MSS-SP-68 face to face dimensions.

Carbon steel or stainless steel construction

Seat leak tested to meet ANSI Class V, Class VI, Bubble tight, Zero leakage or API598, Resilient seated, shutoff requirements.

Shell tested to ANSI and MSS standards.

Efficient operation with hand lever, worm gear, electric, pneumatic and hydraulic actuators.

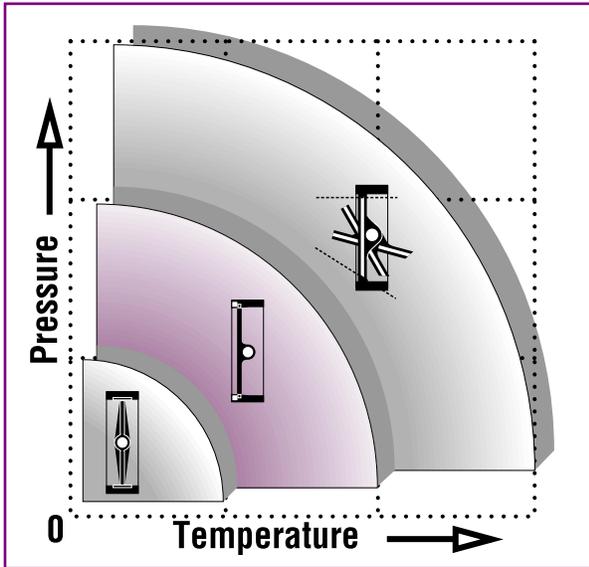
Metal seat is inherently fire safe, verified by tests to API 607.

Excellent flow and throttling characteristics covering a wide range of applications, cryogenic to high temperatures.

TRICENTRIC® PERFORMANCE

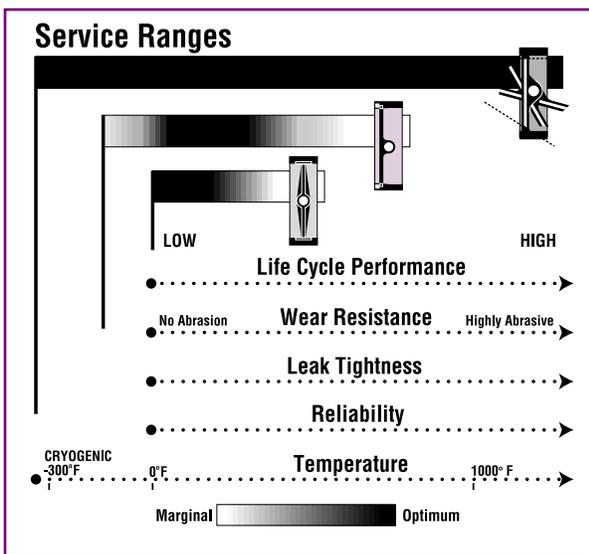
PRESSURE/TEMPERATURE

TRICENTRIC® Metal Seated Valves outperform resilient seated and high performance butterfly valves at high pressure and temperature levels.



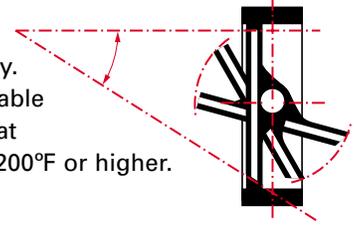
SERVICE RANGES

TRICENTRIC® Valves outperform conventional and high performance butterfly valves over all service ranges.



TRICENTRIC®

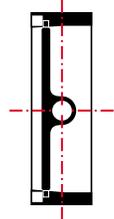
Has 3-Way eccentricity. The metal seat is capable of very tight shut off at temperatures up to 1200°F or higher.



VS.

HIGH-PERFORMANCE

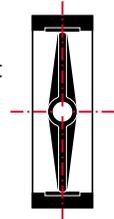
The eccentric shaft results in uninterrupted seal which can be used at higher pressures and temperatures. However, the resilient seats wear and can plug with solids.



or

CONVENTIONAL

Center shaft which penetrates a resilient seal. Suitable for low temperature, low pressure services only.



LUG VALVE

Metal seated butterfly valve with compact light weight design.

WAFER VALVE

Tight isolation valve with light weight construction and compact body dimensions

CRYOGENIC VALVE

Stem extensions are available for Cryogenic application. Testing and materials to meet requirements for LN₂, LO and other Cryogenic services.

AIR OPERATED ISOLATION VALVE

Pneumatic operators available on all TRICENTRIC® Butterfly valves.

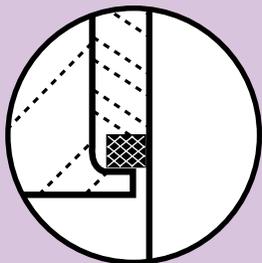
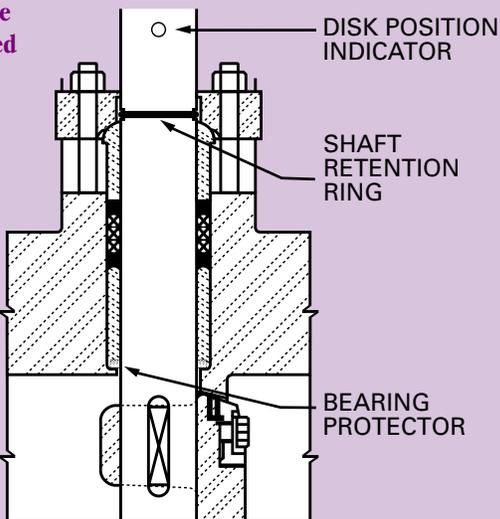
TRICENTRIC® VALVES



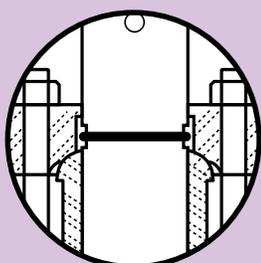
DOUBLE FLANGED VALVES



Double Flanged Detail



BEARING PROTECTOR



SHAFT RETENTION RING

GATE VALVE FACE TO FACE

Dimensions to ANSI B16.10

Can directly replace Gate Valves in line

Less weight

Lower cost

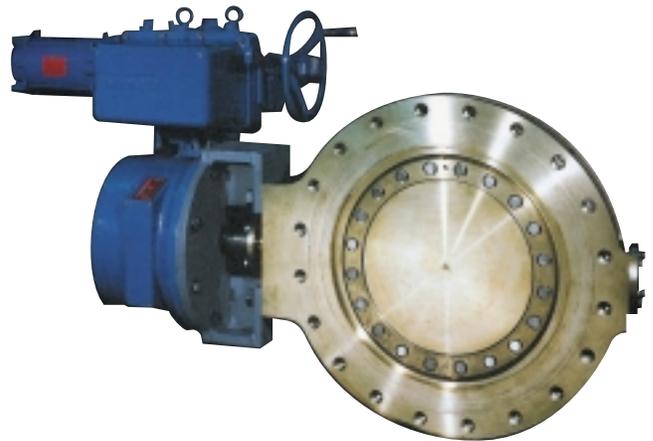
Smaller Operators

ISO 5752 DOUBLE FLANGED

Meets API 609 5th Edition, Blowout proof Stem, Bearing Protectors, Shaft Retention Ring

MOTOR OPERATED ISOLATION VALVE

Motor Operators available for TRICENTRIC® butterfly valves.



OTHER SERVICES AND APPLICATIONS

TRICENTRIC® BLOCK AND BLEED VALVES

Replace Two Isolation Valves with One Valve!

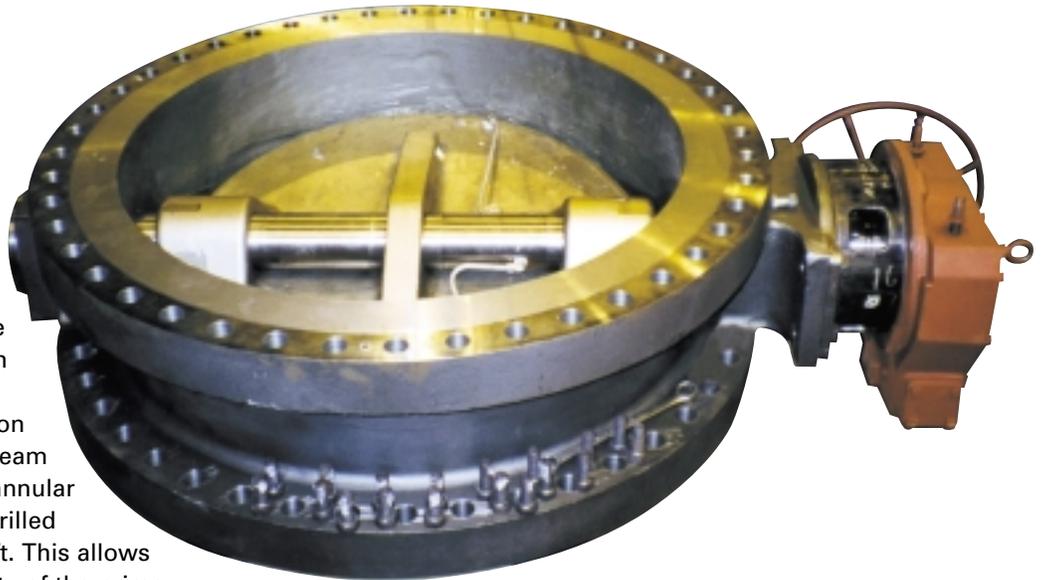
Positive Protections!

Secure, Verifiable Seal!

DESCRIPTION

TRICENTRIC® Block & Bleed Valves provide positive protection for toxic and hazardous fluids. Block & Bleeds use a double seal system with an interseal chamber to assure complete separation of upstream and downstream media. This chamber or annular space is connected to a drilled passage through the shaft. This allows users to verify the integrity of the primary seal or introduce an inert gas or fluid. A vacuum can also be applied to pull out any fluid in the chamber creating a high security seal.

54" Class 150 Double Block & Bleed TRICENTRIC® Valve



Block & Bleed

