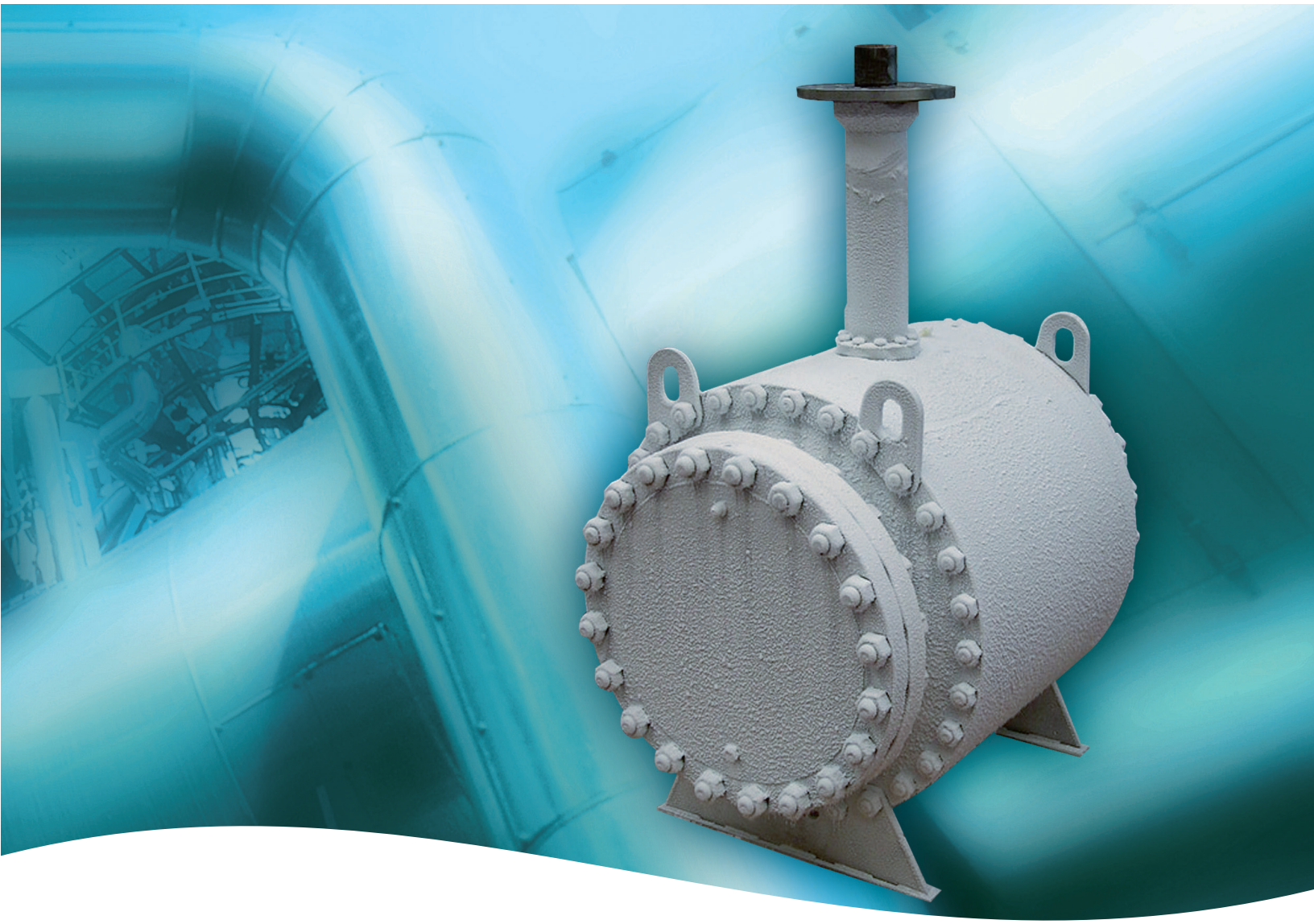
FLOWSERVE

Flowserve TMBV
Cryogenic Ball Valves

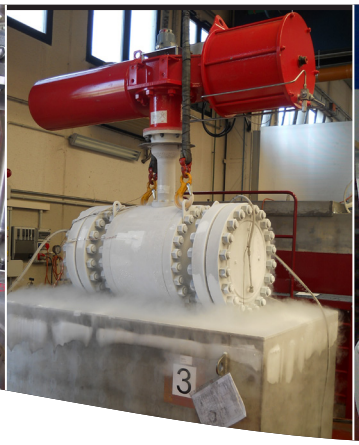


Experience In Motion

Top Entry 24" Class 900

Top Entry 10" Class 300

Side Entry 16" Class 300



Top Entry 12" Class 900

Flowserve TMBV Cryogenic Valves

Optimized design

Flowserve TMBV Cryogenic Ball Valves are designed to meet the most demanding end-users requirements in terms of leakage rates and fugitive emission performance. Body construction and flexible trim configurations deliver durable functionality and high performance in the most stringent of cryogenic applications

Services

Nitrogen (-320ºF / -196ºC)
Argon (- 303ºF / -186ºC)
Carbon Dioxide (-109 ºF / -78ºC)
Carbon Monoxide (- 312ºF/-191ºC)
Ethylene (-155ºF / -104ºC)
Fluorine (- 307ºF / -188ºC)
Methane (- 259ºF/-162ºC)
Nitric Oxide (-241ºF/-151ºC)
Propane (-44ºF/-42ºC)

Applications

LNG Plants
Chemical Plants
Gas Liquefaction
Loading/Unloading Storage
Re-gasification

Accurate Material Selection & Production Technology

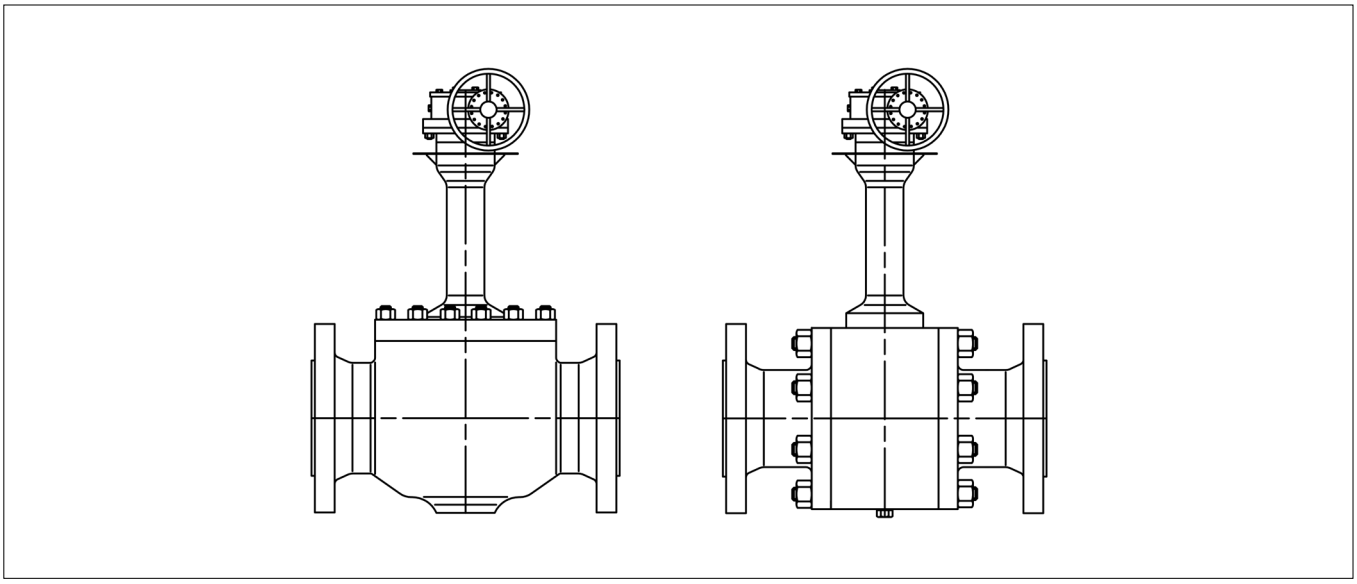
Austenitic stainless steel grades (316 – 304 - 321) are used for pressure containing and controlling parts ensuring optimum performance at cryogenic temperatures. Components are produced from high quality forgings and casting (traditional or centrifuged). High strength materials like 316LN-Mod or Nitronic-50® are available for HP applications (900# & above).

PCTFE (Kel-F®), RPTFE and PEEK are applied as seat inserts. Lip-seals (PTFE jacket & Elgiloy® springs) are used as primary static and dynamic seals.

Applicable Specifications

API/API 6D
ASME B 16.34
BS 6364

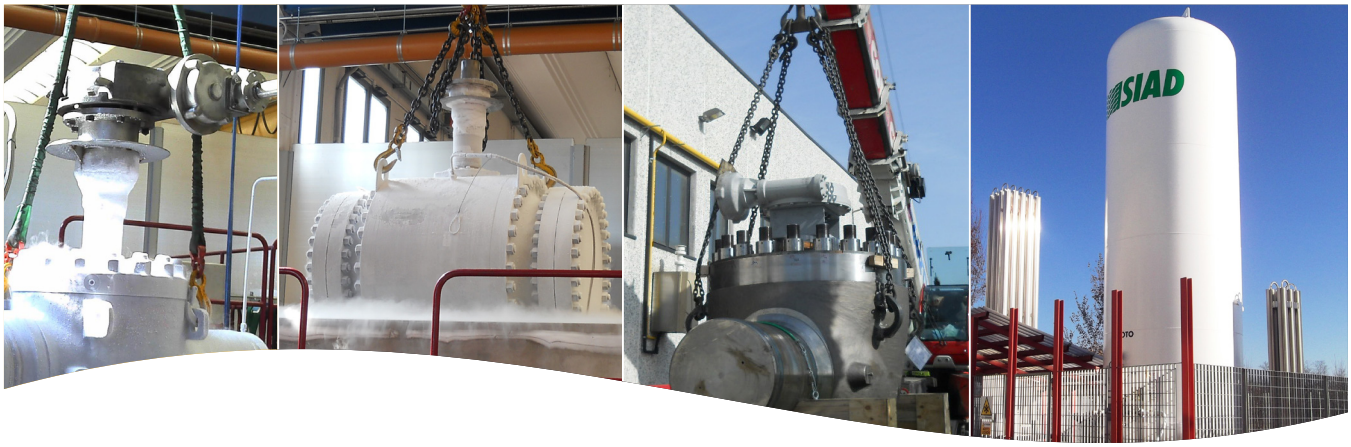
Accurate Material Selection & Production Technology



BODY DESIGN PRESSURE CLASS	TOP ENTRY	SIDE ENTRY SIZE RANGE
150# - 600#	2” - 56”	2” - 56”
900#	2” - 36”	2” - 36”

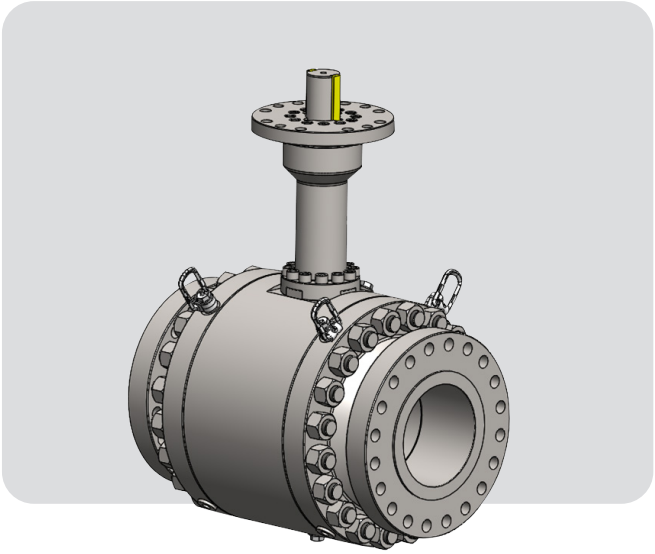
LOW TEMP LIMITS	Down to - 320ºF /-196ºC	Down to - 320ºF /-196ºC
FLOW DIRECTION		
Uni-Directional	✓	✓
Bi-Directional	✓	✓
END CONNECTION		
Butt Weld	✓	✓
Flanged RF/ RTJ	✓	✓
HUB	✓	✓
SEATING		
Soft Seated	✓	✓
Metal Seated	✓	✓
SEAT DESIGN		
SPE	✓	✓
DPE	✓	✓
COMBINED SPE/ DPE	✓	✓

Top Entry 16” Class 900 *Side Entry 36” Class 600* *Top Entry 34” Class 1500* High Pressure Gas Plant



Cryogenic Ball Valve Features

Extended Bonnet Design
Soft and Metal Seat Selection
Double Stem Seals
Innovative Body Seated Gasket Seal
Self Energized Body Seals
Internal Relief



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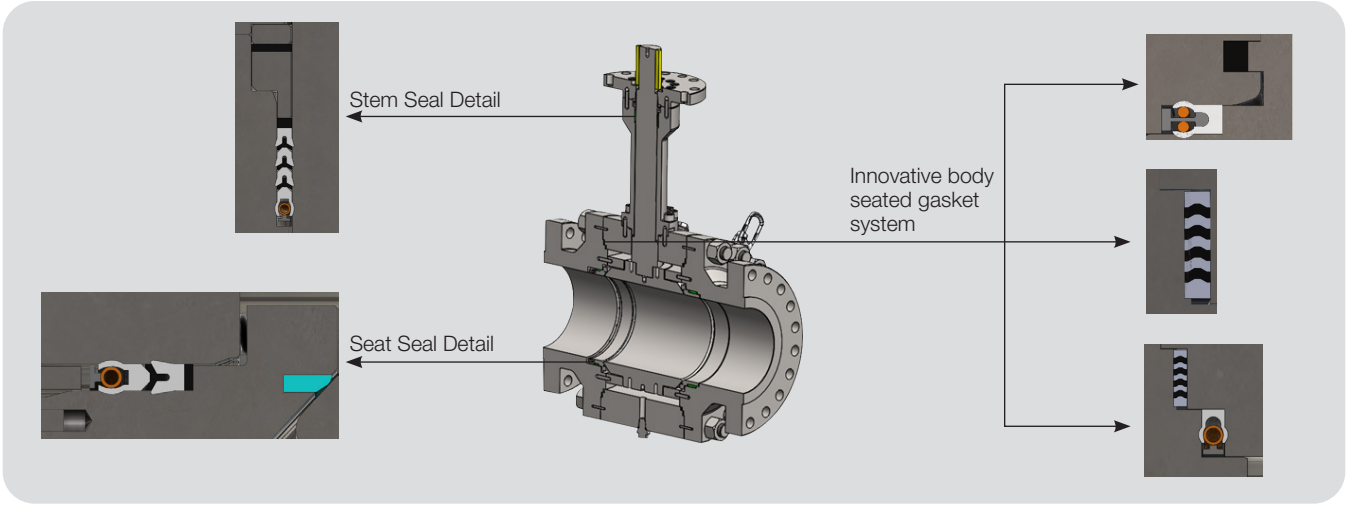

Advantages

Improves seal performance at extremely low temperatures by isolating the stem seals from the cold media

Ensures correct functionality at all possible combinations of temperatures, fluid types and leakage rates

A primary energized lip seal guarantees optimum leakage resistance in demanding cryogenic applications. In critical applications, the leak-proof integrity of the valve is further enhanced by a combination of the primary

energized lip seal and an optional chevron packing (see Figure 1). The stem packing can be adjusted or live-loaded depending on customer requirement

Zero leakage is achieved at extremely low temperatures and high/ low pressure conditions

Automatic excessive body pressure discharge through internal self relieving system. Pressure can be discharged upstream or downstream depending on customer requirement.

Flowserve TMBV Global Cryogenic Testing Capabilities

- Multiple cold boxes available multi sites, up to 52”
- Liquid nitrogen testing capability down to -196°C.
- HP direct nitrogen gasifying system for body and seat gas tests up to 420 barg (higher test pressure available with boosters)
- Helium HP gas test for -196°C testing
- Helium mass spectrometer for fugitive emission test
- Torque test tools c/w strain gauges torque cells
- Data acquisition electronic system.

For more information about Flowserve Corporation, visit www.flowserve.com or call USA 1 800 225 6989

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