STAR LINE®
forged steel ball valves

STARLINE

TRUNNION
MOUNTED BALL VALVES

COMPANY PROFILE

Founded in 1976 by Mr. Santo Rota, **Starline S.p.A.** has grown to be one of the leading companies in the production of Forged ball valves in the world. Since the origin the target of the Company was to manufacture a quality product using Forged components and qualified high level suppliers for all the soft parts (seats and seals) most of which were specifically developed according to Starline design requirements.

The small size valves and related models originally created are still today a masterpiece in the sector, well known by all the end users and manufacturers. Around year 2000 when most of the European manufacturers decided to move production and/or purchases to new Economies in Far East and China, Starline decided to step up the target of the quality and developed new products for critical applications. The range is now extended to larger sizes – Metal seated valves - Cryogenic applications and much more. Today Starline structure counts approx 60 employees.

We are moving into a new factory that extends on an area of 31.700 square meters (of which 17.000 covered) and the production raised up to more than 300.000 valves per year – and still continue to grow.

An accurate R&D department is continuously looking for improvements in design and materials, sophisticated valve testing, dimensional and quality control as well as stocking and logistic systems.
Starline already counts now on the most sophisticated solutions for production management, stock and WMS The new factory is an example of modern technologies applied to every industrial process.

PHILOSOPHY

Starline's philosophy is based on the achievement of the standardization of the highest quality requirements in each single product. All materials used are mandatory produced in Western Europe and all forging companies are located in Italy.
A product **FULLY MADE IN ITALY**

Manufacturing Headquarter

STARLINE forged steel ball valves

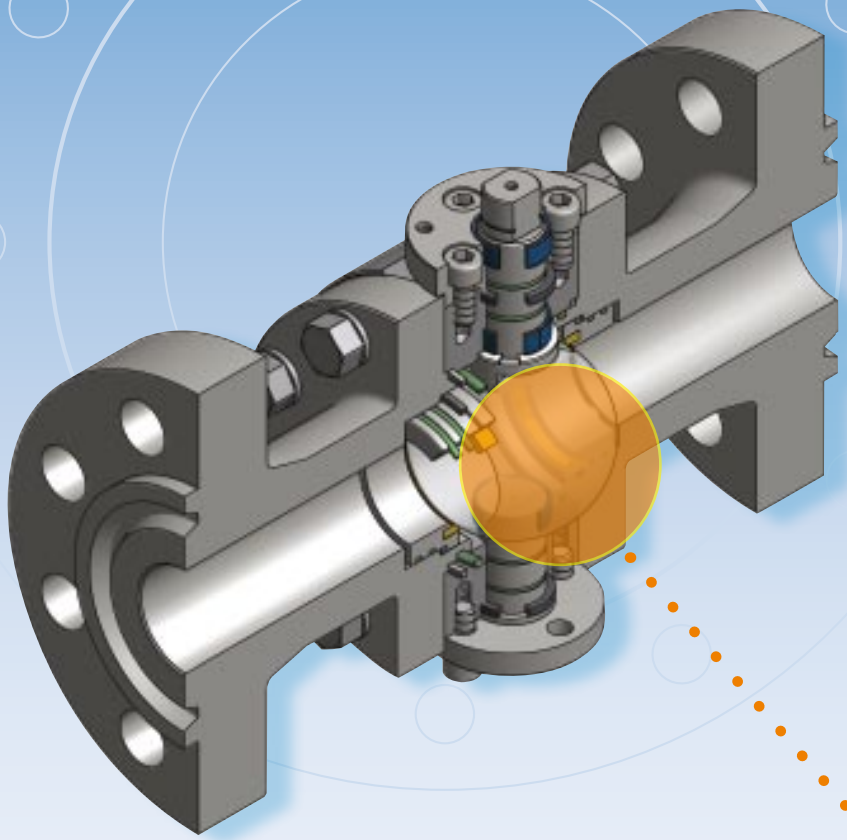
SALES ORGANIZATION

Starline is organized with different offices and distribution points worldwide.

REFERENCES

- ABB LUMMUS
- ADCO
- ADGAS
- ADMA-OPCO
- ADNOC
- AGA CRYO
- AIR LIQUIDE
- AKER
- ALSTOM POWER
- AURAMARINE
- BRITISH GAS
- CELLIER
- CHEVRON
- DSME
- ENAGAS
- ENI
- ENPPI
- FLUXYS
- FORSMARKS KRAFTS GROUP
- FOSTER WHEELER
- GASCO
- GAZ DE FRANCE
- HYUNDAI
- ILVA
- INITEC
- INTECSA
- J.RAY MCDERMOTT
- JGC CORPORATION
- KBR
- KNPC
- KOC
- LINDE
- MARINO ROSETTI
- NESTE OIL
- NIGC
- NIOC
- NPCC
- PDO
- PETROBRAS
- PHILLIPS PETROLEUM
- PTTEP
- SAIPEM
- SAMSUNG
- SBM
- SHELL INTERNATIONAL
- SNAMPROGETTI
- SONATRACH
- SPIE CAPAG
- STATOIL
- TECHNIP
- TECNIMONT
- TOTAL
- WINTERSHALL
- ZADCO

TRUNNION MOUNTED



Trunnion mounted ball valves are based on a system that provide a fixed ball and floating seat rings, moving along the valve axis.
The side load given by the pressure acting on the ball is absorbed by the bearings.
At low pressure the sealing on the seats is obtained by the spring action on the seat rings. The more the pressure increase it pushes the seats against the ball.

DOUBLE BLOCK AND BLEED

Starline valves are supplied as standard exeucution in **DOUBLE BLOCK & BLEED** – Both seats hold the pressure independently from the body cavity pressure.
Block and Bleed execution and Double Piston Effect execution are available as an option.

Starline trunnion mounted valves are available from ½" to 12" – ASME class 150 to 2500 - as well as API 6A 5000 and 10.000 – in several combinations of materials and execution to cover all possible service application from low temperature to high pressure.

INDEPENDENT BALL AND STEM

Ball and stem are manufactured in two separate pieces to reduce the effect of the side load generated by the pressure acting on the ball.

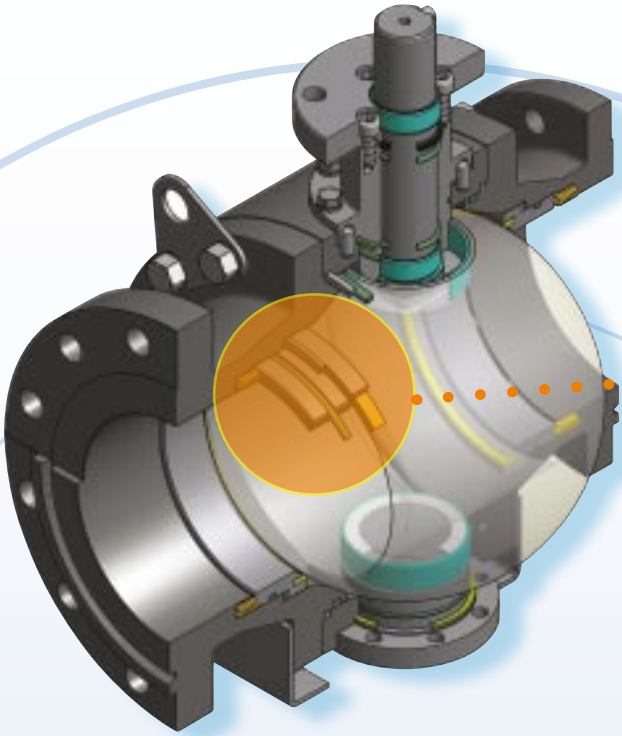
ANTI-STATIC DEVICE

All valves are guaranteed for electrical continuity between all the metal components type tested are duly executed and valves are certified.

TRUNNION MOUNTED

ANTI-BLOWOUT STEM

Stem is retained by the stem cover – other designs are available for each specific request.



Trunnion mounted with heavy duty construction for large sizes low pressure ball valves

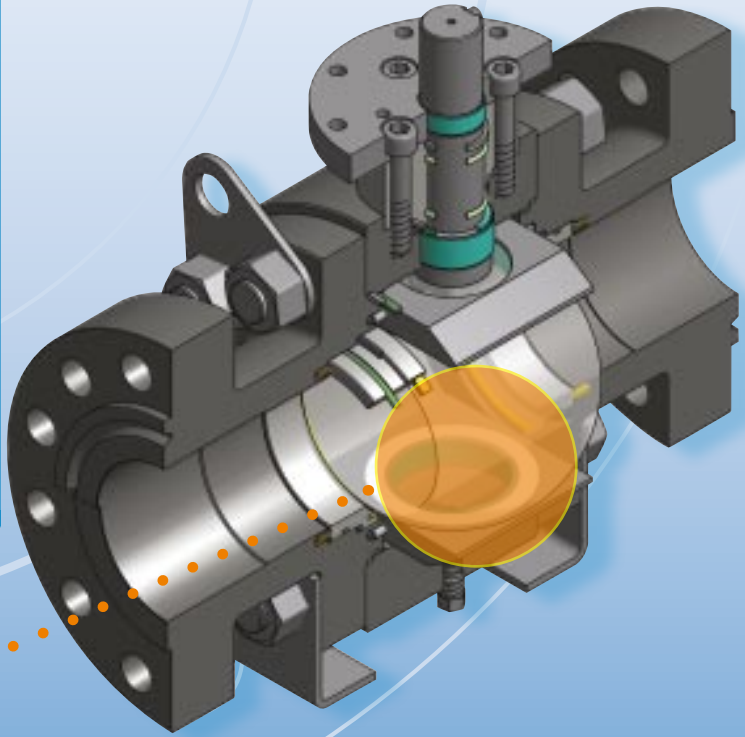
FUGITIVE EMISSION REQUIREMENTS

LOW EMISSION

All Starline ball valves guarantee a full tightness in accordance with the most stringent fugitive emission testing requirements such as ISO 15848 and Shell SPE 77/312). Starline valves covers rate B of both specification as standard execution and RATE A is available on request.

3PCS BOLTED CONSTRUCTION

The 3 pcs construction allows an infinite flexibility in the valve construction in terms of possible end connection combination.



Trunnion mounted with heavy duty construction for large size high pressure ball valves

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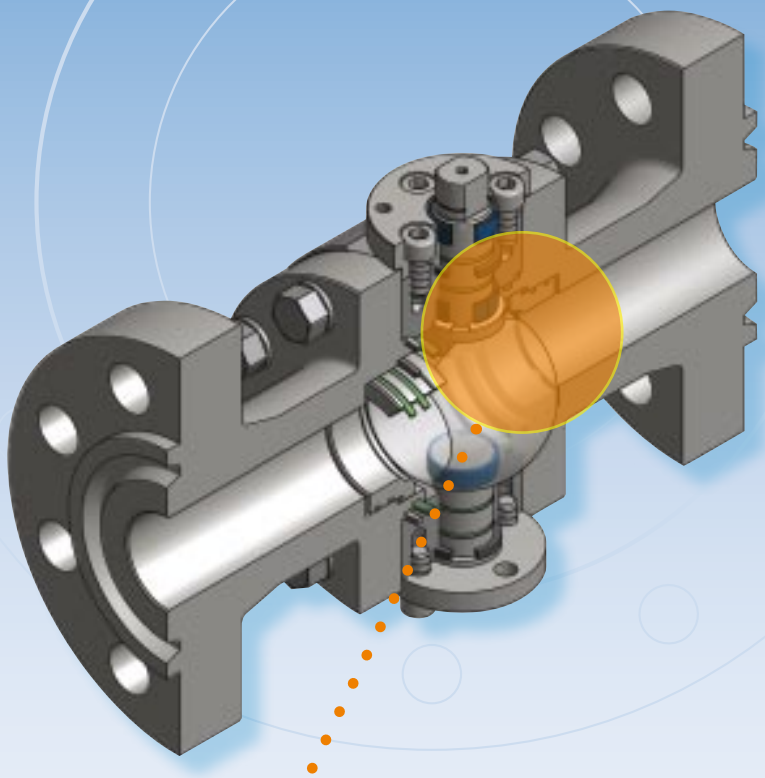
METAL SEATED

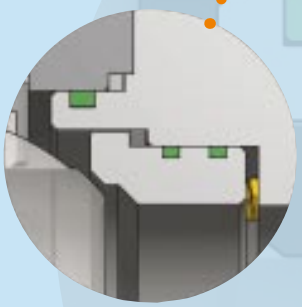
ABRASIVE SERVICE



Valves designed for abrasive service and for restistance to wearing and abrasive media.

This specific execution is using the same basic components of a normal **TRUNNION MOUNTED** valve and only modify the ball and seat material which are coated by min 150 microns of Tungsten and Chrome. On request this valve can be supplied with higher coating thickness up to 400 Microns. The coating treatment is fully certified according to the highest standard requirements.

Starline can guarantee a tightness class according to ISO 5208 RATE A on all sizes and pressure ratings even with GAS TEST.



Tungsten Carbide Coating

Excellent resistance to wearing - good resistance to thermal shock. Max temperature +540°C. Do not use in presence of medium/high corrosion and water solutions.

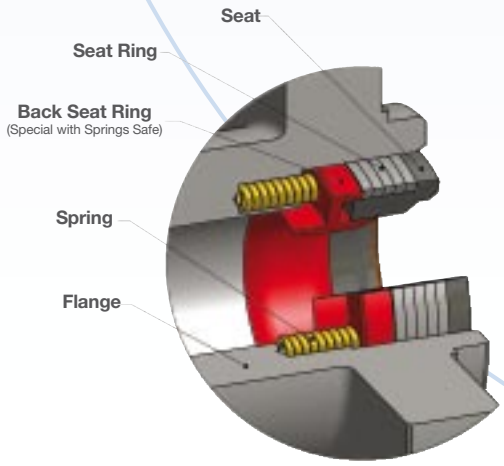
Chrome Carbide Coating

Excellent used for wearing, erosion and oxydation at high temperatures. Normally used on turbines. Max temperature +820°C.

Protected spring solution

For specifically aggressive service, where there is a problem of polymerization or presence of solid components.

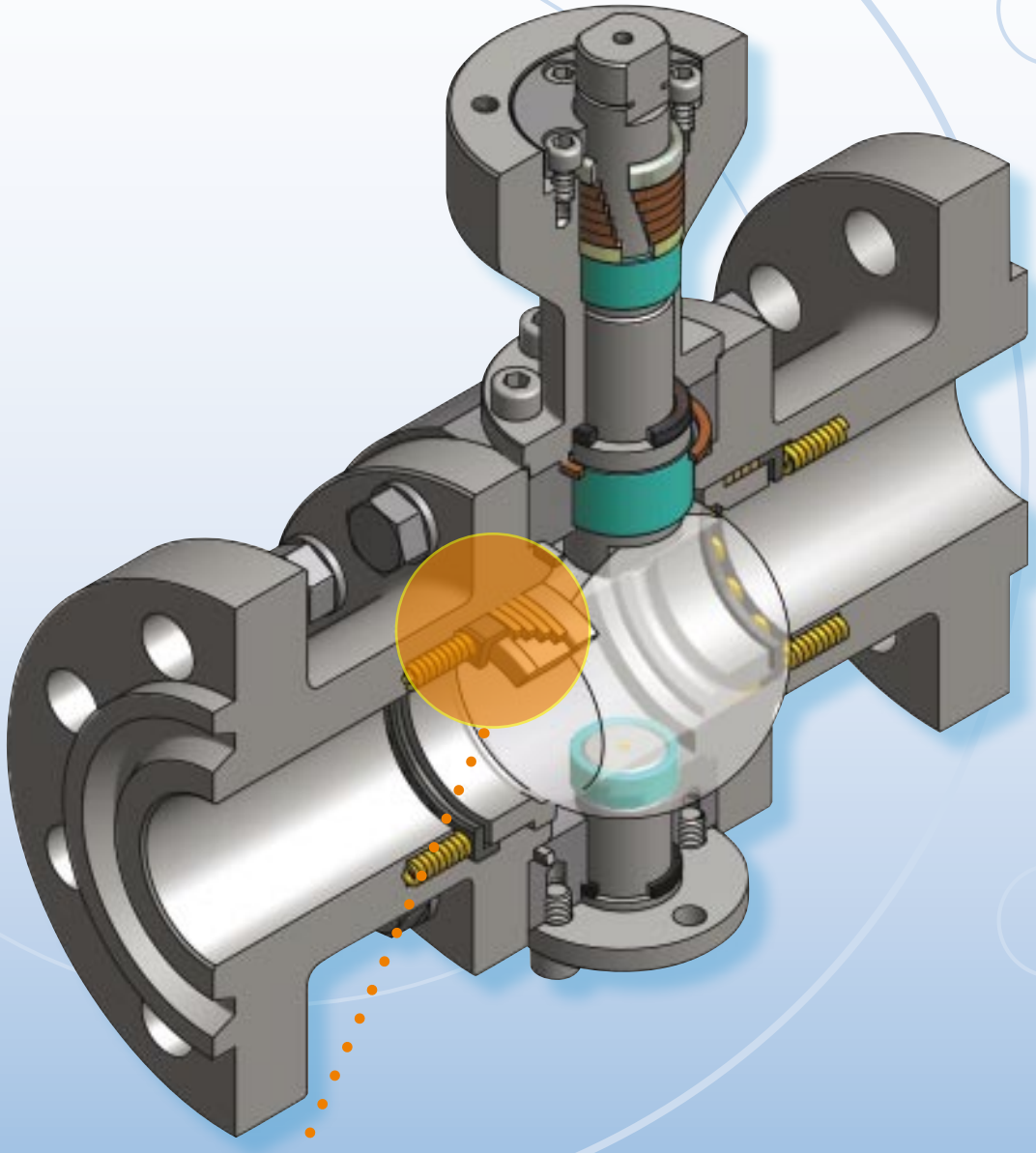
Starline has specifically created a solution with protected springs to guarantee full service of the springs throughout the valve life.

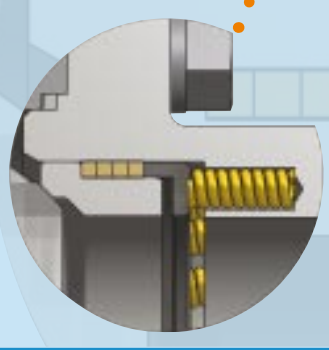


METAL SEATED HIGH TEMPERATURE

For operation in temperatures that do not allow the use of resilient material – Starline has developed a specific design for high temperature.

Valve is specifically equipped with a stem extension for insulation and is available in many different specific materials to face even extreme temperatures.
Starline can guarantee a tightness class according to **ISO 5208 RATE A** on all sizes and pressure ratings even with **GAS TEST**.





This specific valve design has been succesfully used for steam applications – thermal oil and other typical high temperature services.

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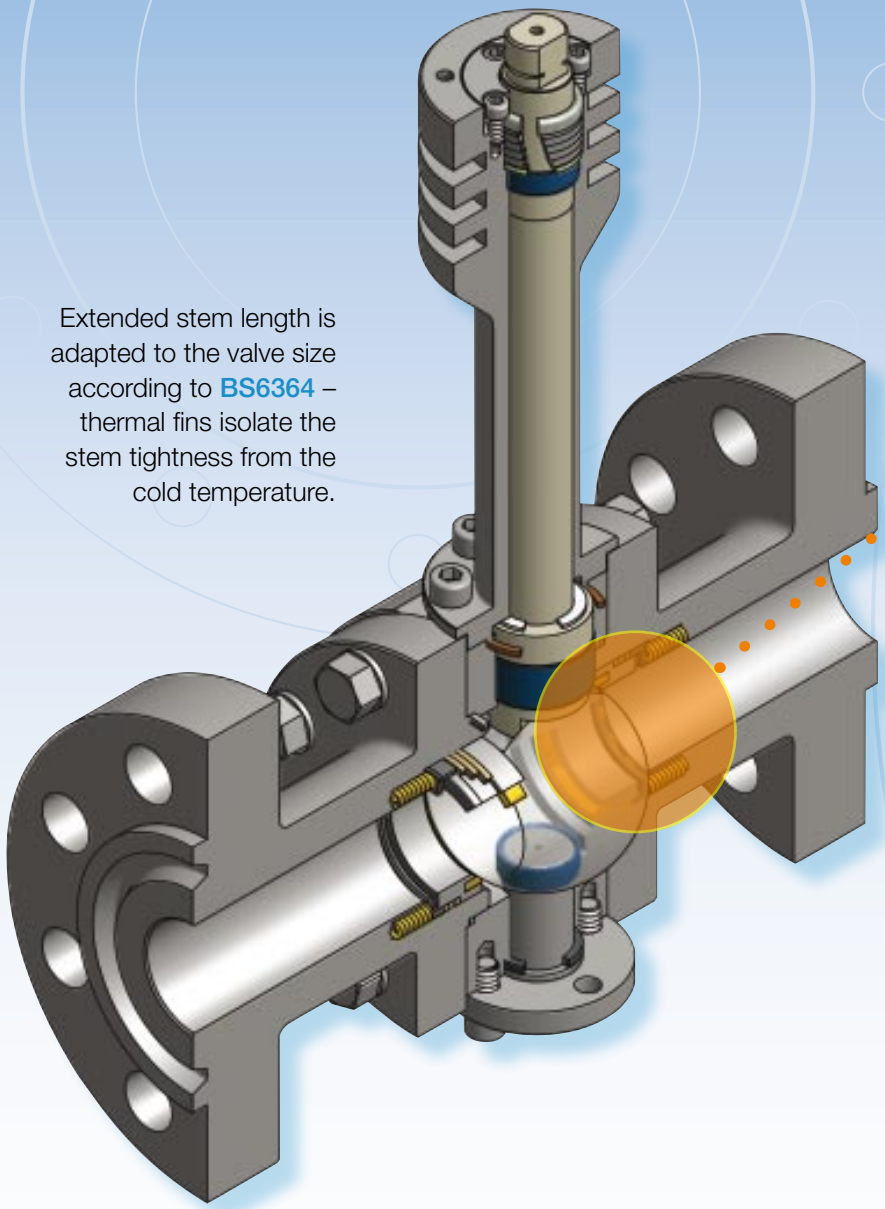
LOW TEMPERATURE CRYOGENIC VALVE

Fully designed to cover **ASME B6364** requirements for full tightness in medium and severe cryogenic service.
This execution has beel fully tested at -196° and perfomed exceptionally.

Extended stem length is adapted to the valve size according to **BS6364** – thermal fins isolate the stem tightness from the cold temperature.



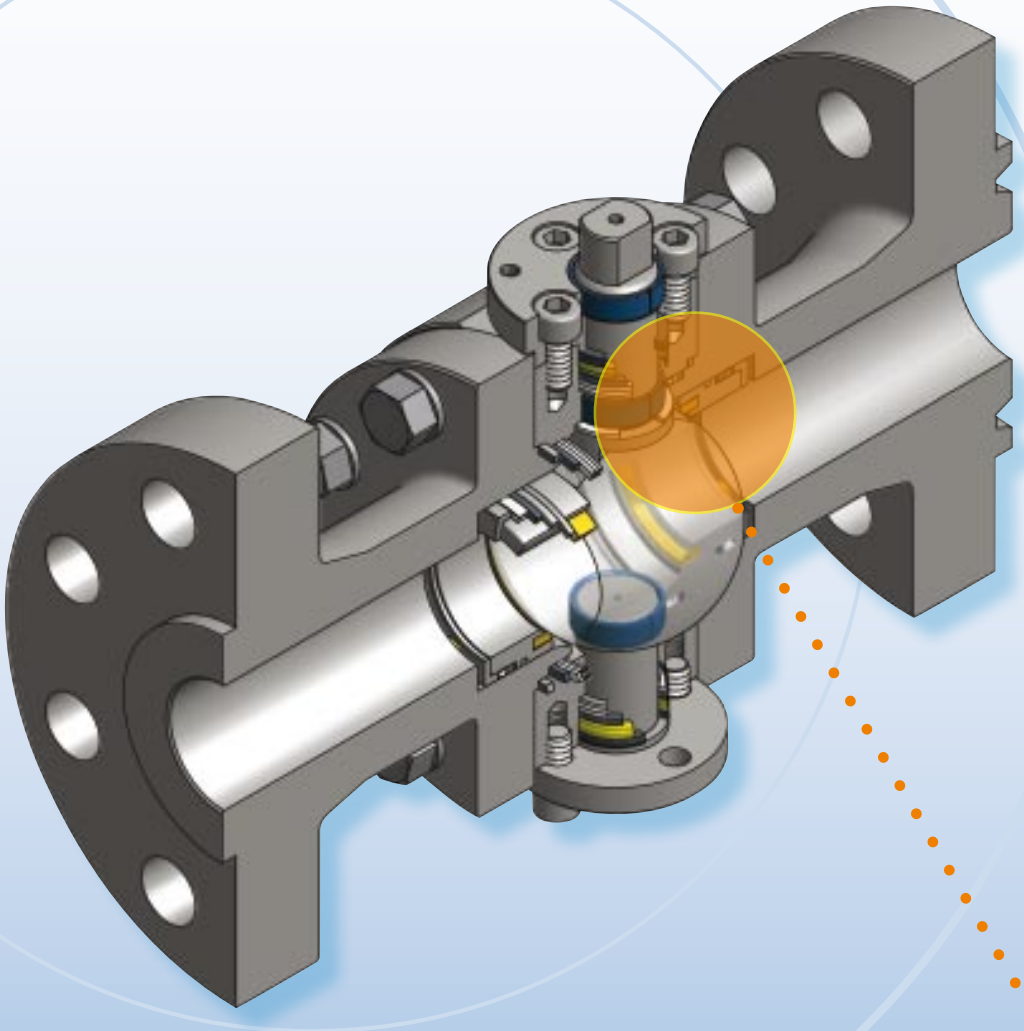
BIDIRECTIONAL VALVES

Remarkable results with thermal shock.

LIP SEAL CONSTRUCTION

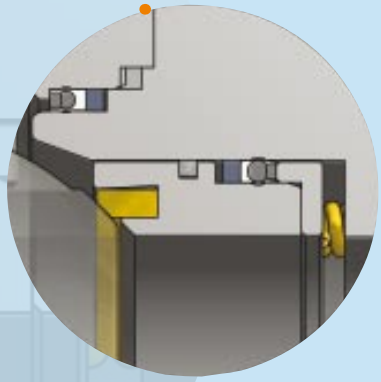
In spite of the continuous research Starline is conducting in finding materials suitable for any kind of application, lip seal design guarantee a full capability to cover any possible service requirement with a good tightness and long life guarantee.

Lip seal design made of **PTFE** sealing with **ELGILOY** springs.



Lip seal design is a good alternative where special Orings are required to cover high percentages of Amine or Methanol, or where high or low temperatures are too stringent.

Valves requires a specific design with modified machining criteria to maintain a high quality performance at all levels.



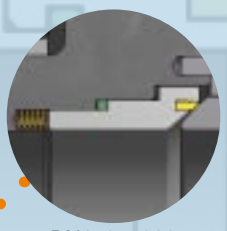
DOUBLE PISTON EFFECT

This valve is required only for special applications where the automatic body cavity relief of the trunnion mounted valves needs to be controlled, limited to upstream side or handled in every different way.

DPE seat design allows for both seats to seal with pressure acting from the same side of the valve. In the event of one seat becomes damaged, the used has the added advantage of the opposite seat sealing.

SEAT DETAIL

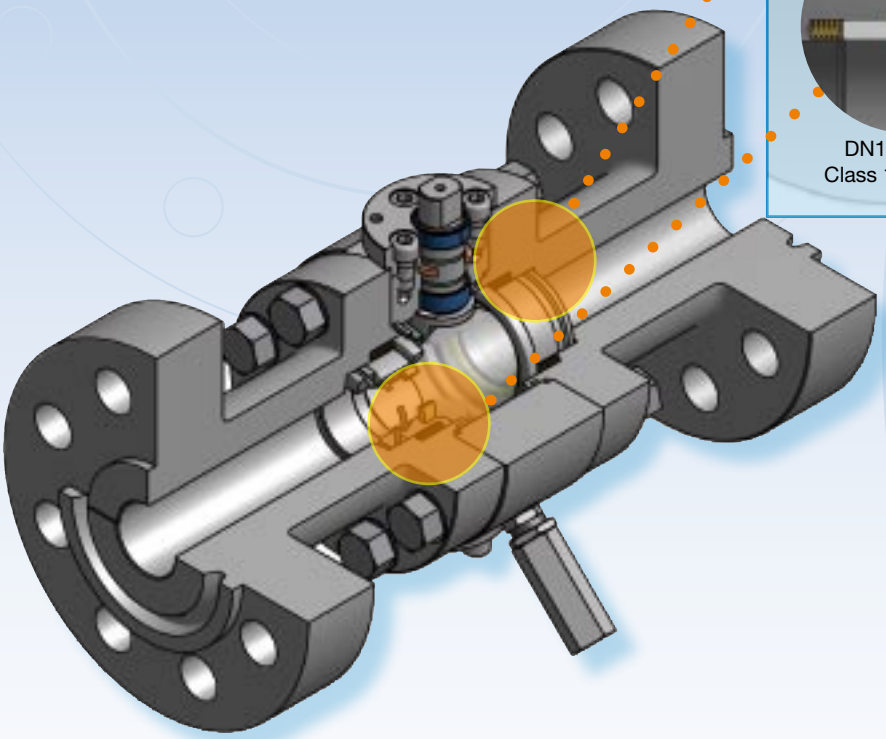
DN15 ÷ 100
Class 150 ÷ 2500



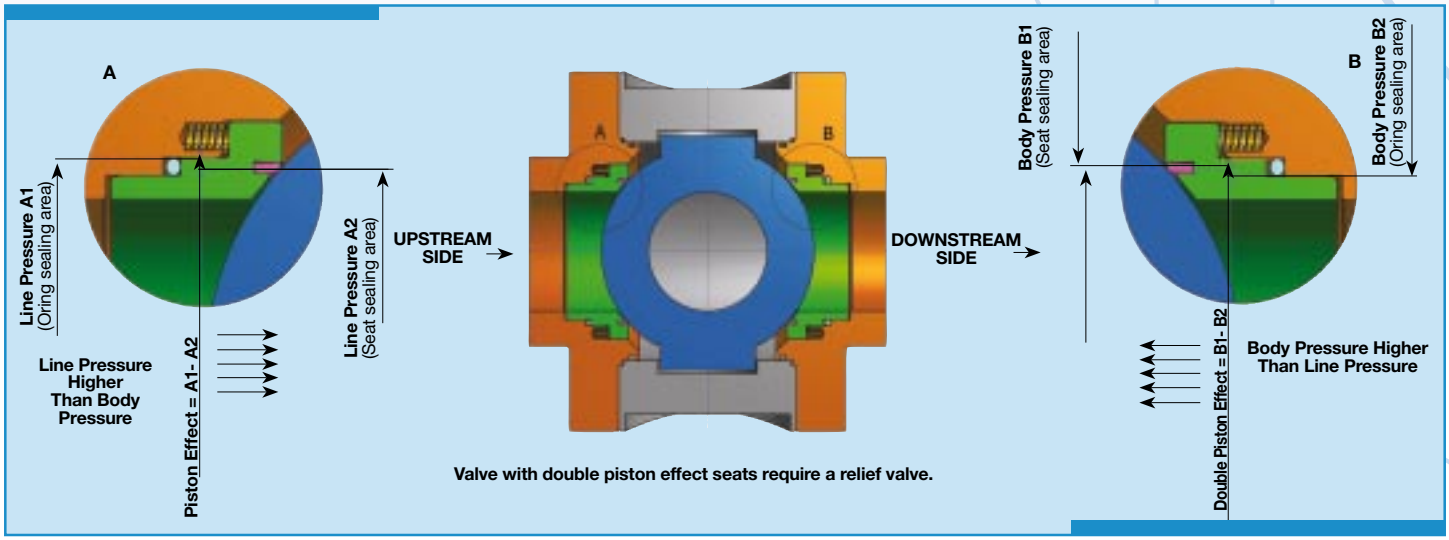
DN150 ÷ 300
Class 150 ÷ 2500

RELIEF DETAIL

Starline provide a personalized relief valve - designed and manufactured directly - fully tested to cycled performance.

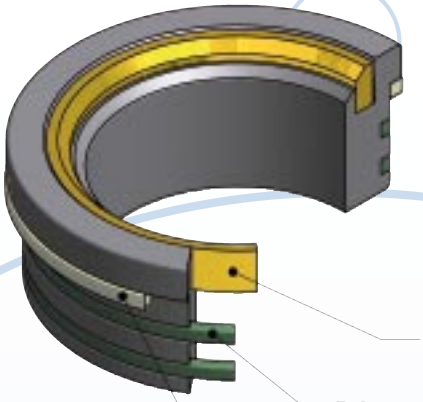


By means of this double barrier, the sealing is assured regardless of the direction of the flow through the valve. If the upstream seat (A) becomes damaged and leaks, the pressure entering the body cavity acts on the downstream seats (B) sealing the downstream seat tightly against the ball.



Valve with double piston effect seats require a relief valve.

AVAILABLE SEATS AND SEALINGS



SEAT INSERT MATERIAL

STARLINE CODE		SEAL MATERIALS	TEMPERATURE RANGE °C	TEMPERATURE RANGE °F	Application	Notes
SOFT	S	REINFORCED **PTFE** 20% Carbon + 5% Graphite	-190 +250	-310 +482	Natural Gas, Steam Service, Diathermic Oil, Hydrocarbons, H2S, Medium Pressure, Low / High Temperature	Higher Temp. and Pressure than Virgin PTFE. Good for Steam Service
	T	VIRGIN **PTFE**	-196 +200	-319 +392	Hydrocarbons, H2S, All Chemicals, Natural Gas, low pressure.	All services subject to temperature limitation.
HARD	N	**DEVLON – V** POLYAMIDE – NYLON	-100 +155	-148 +311	Hydrocarbons,H2S, Natural Gas, High pressures.	Good for high pressure applications not good for water.
	D	**DELRIN** ACETAL RESIN	-70 +95	-94 +203	Hydrocarbons. Nace. Co2. High pressure Low temperature	Do not use for oxygen
	P	**PEEK** POLYETHER KETONE	-80 +220	-62 +428	Hydrocarbons. Nace. For Tobacco and Nuclear Service.	High pressure High temperature
	E	**VESPEL SP 21** POLYIMIDE	-200 +260	-328 +500	Good Chemical Resistance. For Gas, Oil, Petroleum. Not for Steam	High pressure High temperature
	U	**UHMWPE** POLYETHILENE	-150 +150	-240 +300	Food and Tobacco industries Nuclear service	Low pressure. Low torque
	Z	**TEFZEL** ETFE (704-25)	-100 +180	-73 +350	Good Chemical Resistance Nuclear Service	Medium pressure Low temp. – High temp.
	Y	**PFA**	-196 +260	-319 +500	Lower Porosity – Particularly Good to Avoid Polymerisation	Medium pressure Low/Medium Temperature

SEAL MATERIALS

		MATERIAL TYPE		TEMPERATURE RANGE		APPLICATION
"O" RINGS	N	**NITRILE**	**NBR**	-30°C/ -22°F	+120°C / +248°F	Water Service
	M	**HYDROGENATED NITRILE**	**HNBR**	-30/ -22°F	+160 °C / +320°F	High Pressure Water
	E	**MODIFIED HYDROGENATED NITRILE**	**HNBR**	-40/ -40°F	+160 / +320°F	Sweet gas mixture, Hydrogen Sulphide up to 10%, Amine Corrosion Inhibitors up to 5%, Methanol
	V	**FLUOROELASTOMERS** (VITON B)	**FKM**	-20/ -4°F	+220 / +428°F	Standard Viton used on lower pressures
	V	**FLUOROELASTOMERS** (VITON AED)	**FKM**	-20/ -40°F	+220 / +428°F	Sweet gas mixtures and aromatic hydrocarbons. ED service
	V	**FLUOROELASTOMERS** (VITON GLT)	**FKM**	-40/ -40°F	+220 / +428°F	Lower temperatures than standard Viton
	C	**PERFLUOROELASTOMERS** (CHEMRAZ 526)	**FFKM**	-25/ -13°F	+250°C/ +482°F	Good chemical resistance, High temperature, H2S, Xylene, Toluene contents
	K	**PERFLUOROELASTOMERS** (KALREZ)	**FFKM**	-20/-4°F	+327/ +620°F	Good extrusion and chemical resistance. Excellent resistance to Sour oil and Amine.
	A	**AFLAS**	**FEPM**	+5/+41°F	+200/ +392°F	Sour gas mixtures and amine based corrosion inhibitors. Good for hot water and steam.
	I	**SILICON+PFA**		-60/ -76°F	+240/ +464°F	Low temperature applications/ Good Chemical Resistance
SPECIAL	G	**EXPANDED GRAPHITE**		-240/ 400°F	+680/ +1256°F	Used on Metal Seated High Temperature valves
	L	**PTFE + ELGILOY**		-196/-320°F	+260/ +500°F	Good for Chemical Resistance and Low Temperatures

FIRE SAFE SEAL

MATERIAL TYPE		TEMPERATURE RANGE °C		APPLICATION
G	**GRAPHITE**	-240/ 400°F	+680/ +1256°F	Back up seal for fire safe valves

Note: all information reported are based on material data sheet – Starline reserve the right to verify such information contained here above referred to specific media concentration and pressure/temperature related.

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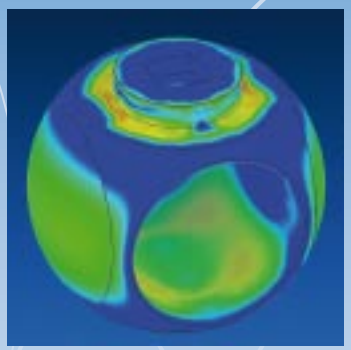
CONTINUOUS RESEARCH AND DEVELOPMENT

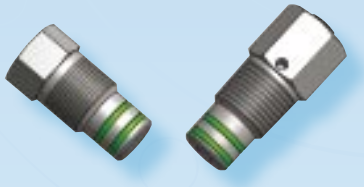
Have you got a problem on a specific service application?
Get in touch with us and we will certainly find a proper solution!



TECHNICAL FEATURES

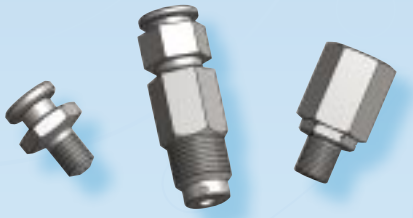
Starline Trunnion mounted valves are supplied as standard in Double Block and Bleed execution single piston effect (self relieving seats), with 2 bleeder on all sizes (for safety reasons).

ACCESSORIES AVAILABLE



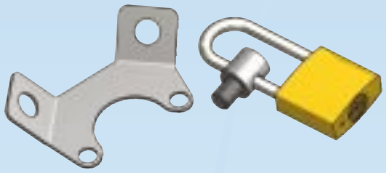
BLEEDER

Anti-blowout bleed plug with 2 orings as standard execution.



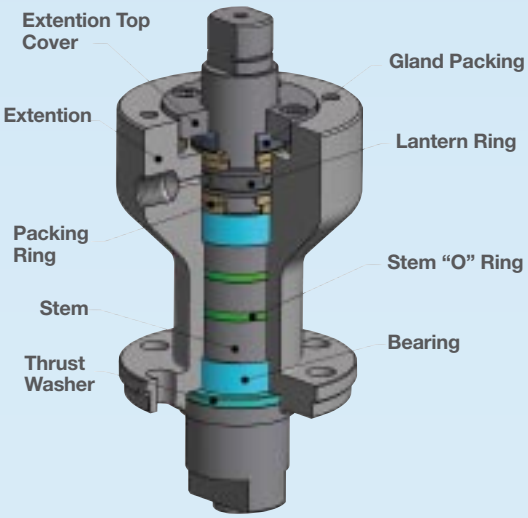
STEM/SEAT SEALING INJECTION

Typical execution of stem and seat grease injection for valves 2” and above.



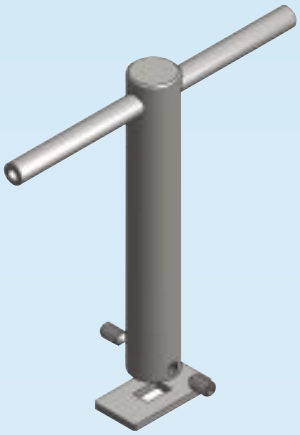
LOCKING DEVICE

Two different execution of locking device are available for these valves.



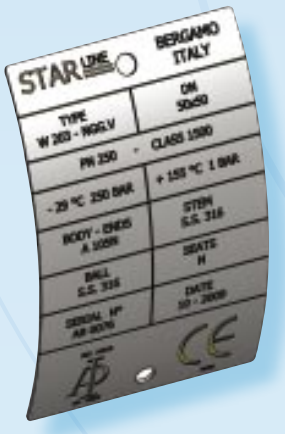
EXTENDED STEM WITH LANTERN RING

For fugitive emission requirement, typical extended stem with leak detection.



T - HANDLE

T - handle for thermal insulation.



NAME PLATE

Starline provide a fully 316 stainless steel name plate as standard clear legible characters – fully in accordance with **API 6D – ISO 14313**

AUTOMATION

All valves are ready to fit actuator – with **ISO 5211** top.
Testing facilities are available for functional tests with valve/actuator.
Valve torque values are available upon request and are calculated in a very accurate way and adjusted according to the following table:

SAFETY FACTORS CALCULATION

TORQUE ADJUSTEMENT TO SELECT ACTUATOR									
Multiplier factor can influence torque									
Net Break Away Torque of Valve	Process Media		Process temperature		Frequence of Operation		Suggested Safety Factor		Torque to Select Actuator
	Liquid, clean particle free	10%	Ambient -29°C + 38°C	10%	one per day to one per week	10%	gear	30%	
	Liquid, dirty, slurry, raw water	60%	Low -29°C -90°C	30%	one per week to one per mounth	20%	actuator	30%	
	Liquid, black liquor lime slurry	80%	Cryogenic -90°C -196°C	90%	over one per month	30%			
	Liquid, oil, lubricating	10%	Medium +38°C +200°C	30%	Emergency shut down	70%			
	Liquid, viscous, molasses	30%	High +200°C +700°C	90%					
	Gas, clean & wet, saturated steam	50%							
	Gas, dry, steam, natural gas	80%							
	Slurry service	90%							
	Oxigen, chlorine, hydrogen, helium	80%							

QUALITY STANDARDS

All valves respond to the following technical requirements:

- **ISO 9001:2008**
- **API6D ISO14313**
- **API 6A (IF APPLICABLE)**
- **ISO 5211**
- **NACE MR0175 – NACE MR0103**
- **ASME B16.5 – ASME B16.10**
- **ASME B16.25 – ASME B16.34**
- **SIL 3**
- **FIRESAFE API607 – API 6FA – ISO10497**
- **TA-LUFT**
- **PED MOD H CAT.3**
- **ISO 15848**

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NDE AND TESTING FACILITIES

- **UT** Ultrasonic testing according to ASME V
- **DPI** Dye Penetrant Inspection according to ASME VIII
- **MPI** Magnetic Particole Inspection according to ASME V
- **PMI** Positive Material Identification (Alloy Verification) with Niton XL instrument




Specific valve testing such as:
- Fugitive Emission Testing to **ISO 15848** and **SPE 77/312** with mass spectormeter Phonix L-300 and duly certified personnel.
- Cryogenic test bench – for low temperature and cryogenic testing up to -196°C.
- High Temperature oven – for high temperature valve testing up to extreme temperatures such as 500 °C.
- Starline tests 100% of the valves manufactured according to **API 6D / API 598.**

Standard tests carried out:

- Visual and dimensional check
- High pressure Hydrostatic shell and seat test
- Low pressure air seat test
- Stem torque check

Other valve test available:

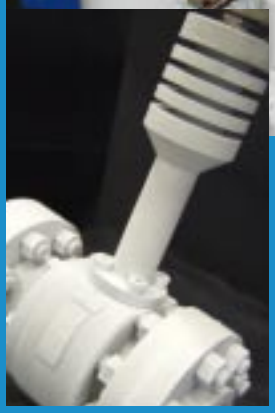
- High pressure gas test (shell and seat)
- Antistatic test
- Seat relief test



PHOTOGALLERY













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Trunnion 2010 - Rev.0

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