



# SUBSEA VALVES

valves and actuators

**30** years plus  
of **LEADERSHIP**  
and **INNOVATION**  
in subsea valves

**PETROLVALVES** has been a leader in the manufacture of Subsea valves since the early 1970s, with our first installations in the North Sea.

Today, the Company's valves and actuators are installed worldwide in a very large number of Subsea pipelines and production modules.

This is a testament to the level of confidence that major End Users and EPCs have in **PETROLVALVES**.

As line pressures continue to rise and the water depths extend beyond 10,000ft /3000 meters, **PETROLVALVES** continues to improve product reliability to provide customized solution for each unique operational requirement.



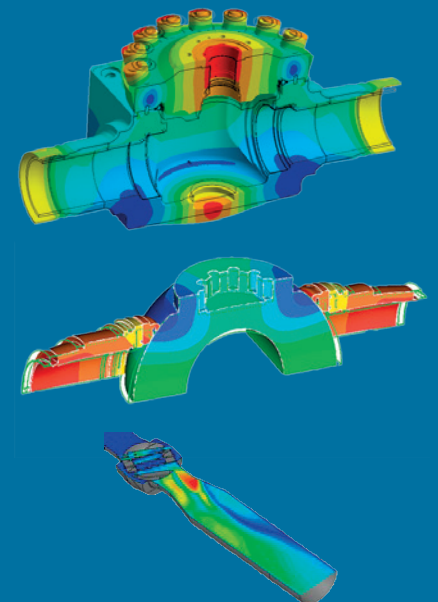
16" Class 1500 valve supplied in 1978

design  
**FE&CFD**

**PETROLVALVES** Engineering uses the most sophisticated and advanced Numerical Simulation Tools.

Both Elastic and Elastic-Plastic FE simulations are utilized to optimize performances and improve reliability in operation under any predictable loading conditions including internal & external pressure, mechanical loads and thermal gradients. Extensive use of CFD is made to verify valve fluid-dynamic performance.

The experienced **PETROLVALVES** Engineering Team can develop customized solutions to suit any specific operational requirement up through API 20 K.



## product

### QUALIFICATION

**PETROLVALVES** has an extremely large record of previous qualifications successfully performed :

- ▶ PR2 Design Validation Test according to API 6A /ISO 10423 Annex F
- ▶ Endurance Test According to API 17D
- ▶ Sand slurry test according to API 6A/ISO 10423 ANNEX I Class II
- ▶ Sand slurry test according to API 6AV1
- ▶ Hyperbaric Test according to API 17D Annex L
- ▶ A number of customized qualification Procedures

## materials

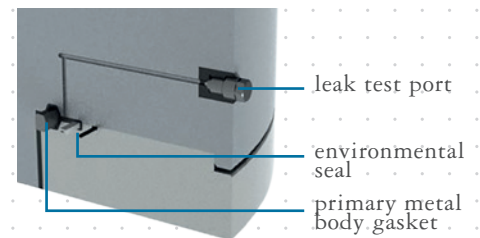
VALVE TYPE	AVAILABLE BODY MATERIAL SELECTION	AVAILABLE OBTURATOR MATERIAL SELECTION	AVAILABLE SEAT MATERIAL SELECTION
BALL	Cast or Forged: LTCS; Inconel Cladded	Forged: LTCS or Low Alloy Steel; Inconel Cladded	Forged: Duplex, Super Duplex, Ni Alloy HardFacing: TCC
GATE		Cast or Forged: Duplex, Super Duplex, Ni Alloy HardFacing: TCC	
CHECK	Cast or Forged: Duplex, SuperDuplex, Ni Alloy	Cast or Forged: LTCS; Inconel cladded Forged: Low Alloy Steel; Inconel cladded Cast or Forged: Duplex, SuperDuplex, Ni Alloy HardFacing: Stellite	Forged: Duplex, Super Duplex, Ni Alloy HardFacing: Stellite

01

## seals

### BODY SEALS

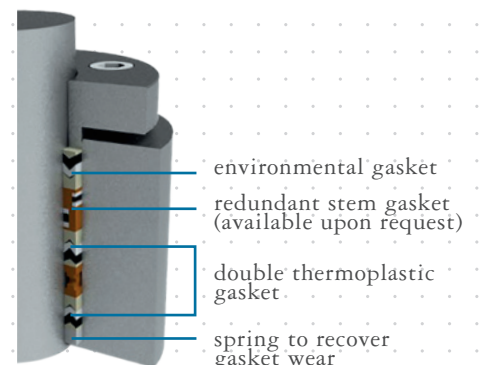
All primary body gaskets are bi directional metal-to-metal to provide tight seal both toward and from environment. Typical arrangement also include a secondary environmental soft seal which provides an additional barrier to seawater ingress into the valve.



### STEM SEALS

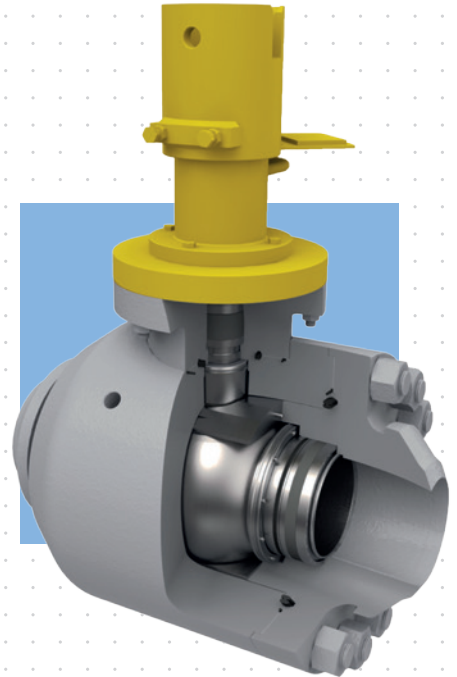
**PETROLVALVES** (proprietary design) subsea stem gasket is qualified up to 12,500 psi internal pressure and 3000 m water depth.

In addition, **PV's** patented Infinity Seal is available as an option. Through the employment of this metal to metal stem gasket, the guaranteed operational life can be extended.



## hp metal floating ball (triforce) SUBSEA

- ▶ No internal valve part can become stuck: valve provides tight seal and full operability even with fluids that can solidify or crystallize
- ▶ The valve and all the components, including gaskets, are designed for deep subsea installation & operation
- ▶ Seat and ball sealing surfaces match under low contact stress and self-cleaning operation
- ▶ Superior resistance to abrasion and wear



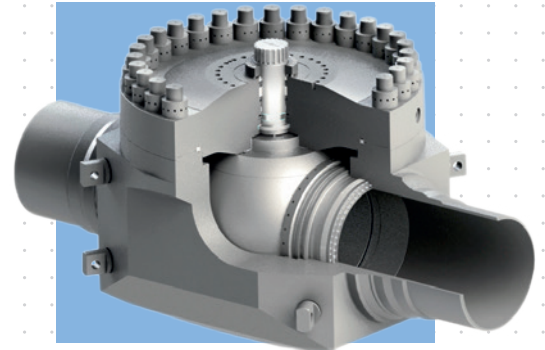
AVAILABLE RANGE *				
API 6DSS		API 6A / 17D		
150 to 1500	2500	2K to 5K	10K	15K
2" to 24"	18"	1 <sup>3</sup> / <sub>16</sub> " to 20"	1 <sup>3</sup> / <sub>16</sub> " to 16"	1 <sup>3</sup> / <sub>16</sub> " to 6"

**HEAVY  
DUTY  
SERVICE**

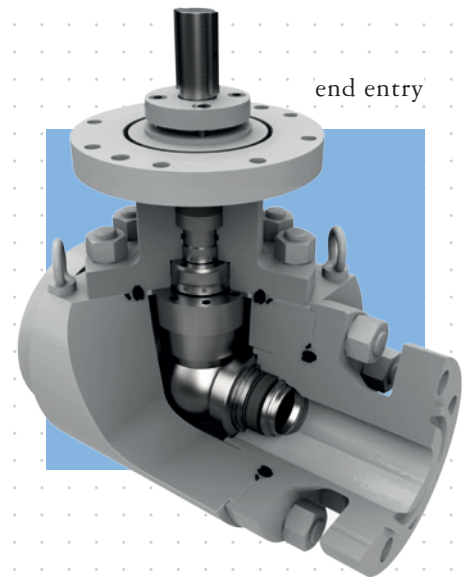
(\*) For non-listed dimensions contact PV's staff

## trunnion supported ball valves SUBSEA

- ▶ **PETROLVALVES** trunnion mounted, full or reduced bore, metal seated.
- ▶ The valve and all the components, including gaskets, are the result of extensive Design and R&D programs aimed to verify their suitability for deep Subsea installation & operation
- ▶ The valve internal profile is shaped to minimize turbulence and to avoid any potential obstacle for the passage of pigs
- ▶ The valve body is designed to accommodate all predictable loads, including induced loads during installation
- ▶ Seat & ball flexibility/rigidity is designed to accommodate mutual elastic displacements
- ▶ Standard construction includes primary metal-to-metal, bi-directional body-to-environment seal
- ▶ Large variety of stem seal options available, including Infinity metal stem seal (**PETROLVALVES** patent)
- ▶ Both Self-Relieving (SPE) and Double Piston Effect (DPE) seat designs are available
- ▶ Double isolation construction (two trims in one unique body) is also available



top entry



end entry

LOW  
OPERATING  
TORQUE

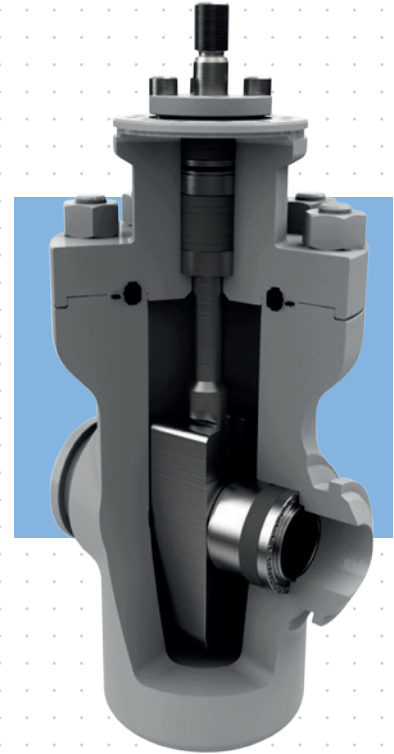
03

AVAILABLE RANGE*				
API 6DSS		API 6A / 17D		
150 to 1500	2500	2K to 5K	10K	15K
2' to 48"	32'	1 <sup>3/16</sup> " to 34"	1 <sup>3/16</sup> " to 24"	1 <sup>3/16</sup> " to 8"

(\*) For non-listed dimensions contact PV's staff

slab gate valves  
**SUBSEA**

- ▶ Metal-to-metal seat seal
- ▶ Primary metal seat-to-body seal
- ▶ Standard construction includes metal-to-metal, bi-directional body-to-environment seal
- ▶ Large variety of stem seals available, including Infinity<sup>®</sup> metal stem seal (**PETROLVALVES** patent)
- ▶ Proven design for extreme deepwater installation.
- ▶ Slab & seat rings match on fully hard-faced surfaces
- ▶ Both upstream and downstream seat seal designs are available
- ▶ Double isolation construction (two gate trims in one body also available)
- ▶ Twin seats design available for subsea pipeline installation



**LOW CONTACT  
STRESS  
METAL SEAL**

AVAILABLE RANGE *				
API 6DSS		API 6A / 17D		
150 to 1500	2500	2K to 5K	10K	15K
2" to 42"	30"	1 <sup>3</sup> / <sub>16</sub> " to 30"	1 <sup>3</sup> / <sub>16</sub> " to 24"	1 <sup>3</sup> / <sub>16</sub> " to 12"

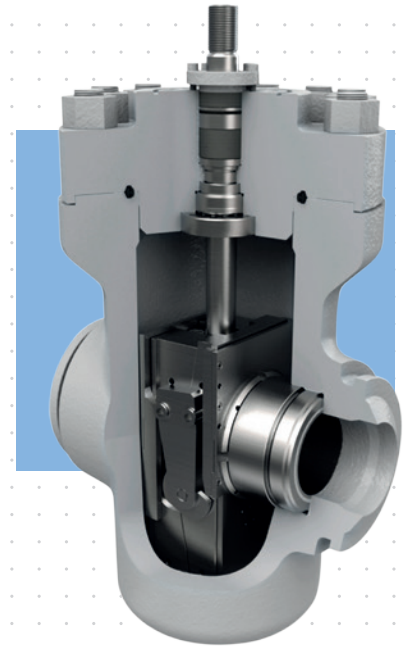
(\*) For non-listed dimensions contact PV's staff

## double expanding gate valves SUBSEA

Double Expanding Gate Valves seal via mechanical means, stem thrust achieves bubble-tight seal simultaneously and independently at both upstream and downstream seat.

Thus the valve creates a true and intrinsic double barrier.

- ▶ Proven design for extreme deep subsea installation
- ▶ Fully metal-metal seal (both seat-body and seat-gate)
- ▶ Double block & bleed, double barrier
- ▶ Extremely highly reliable in severe service, including deep subsea installations
- ▶ Large variety of stem seals available, including Infinity metal stem seal (**PETROLVALVES** patent)
- ▶ Flexible seat design guarantees low contact stresses for an extended cyclic life
- ▶ Any valve end connection is available



INTRINSICALLY  
DOUBLE  
ISOLATION

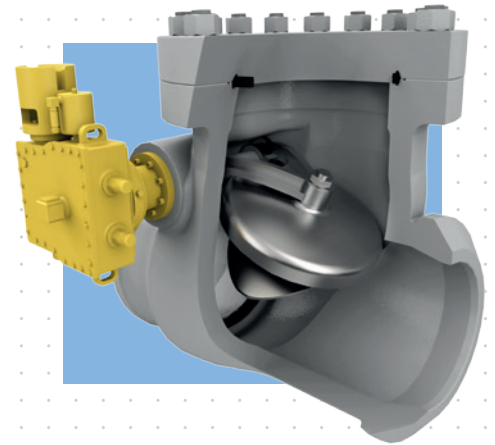
05

AVAILABLE RANGE*				
API 6DSS		API 6A / 17D		
150 to 1500	2500	2K to 5K	10K	15K
2" to 48"	30"	1 <sup>3</sup> / <sub>16</sub> " to 30"	1 <sup>3</sup> / <sub>16</sub> " to 24"	1 <sup>3</sup> / <sub>16</sub> " to 12"

(\*) For non-listed dimensions contact PV's staff

## swing check valves SUBSEA

- ▶ Designed for deep subsea installation and operations
- ▶ Standard seat seal: metal-to-metal
- ▶ Lock open via ROV engagement
- ▶ Smooth transition of internal conduit for safe pigging operations
- ▶ Pig guide, integral with clapper, permits safe pigging in either direction
- ▶ Different clapper-locking mechanism design are available to allow safe 'reverse' pigging operations
- ▶ Large variety of stem seals available, including Infinity metal stem seal



**SAFE  
PIGGING**

AVAILABLE RANGE *				
API 6DSS		API 6A / 17D		
150 to 1500	2500	2K to 5K	10K	15K
2" to 48"	30"	1 <sup>3</sup> / <sub>16</sub> " to 30"	1 <sup>3</sup> / <sub>16</sub> " to 20"	1 <sup>3</sup> / <sub>16</sub> " to 8"



(\*) For non-listed dimensions contact PV's staff

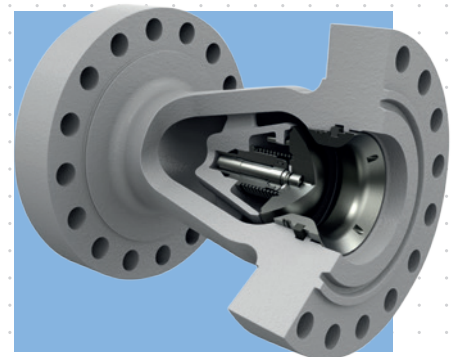
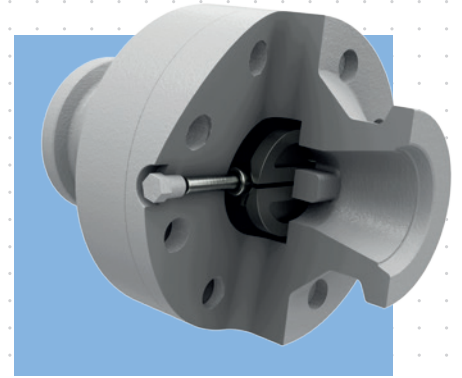


## non slam check valves SUBSEA

- ▶ Suitable for deep subsea installation and operations
- ▶ Non-Slam; quick (spring assisted) closure
- ▶ Standard seat seal: metal-to-metal

AVAILABLE RANGE*				
API 6DSS		API 6A / 17D		
150 to 1500	2500	2K to 5K	10K	15K
2" to 48"	30"	1 <sup>3</sup> / <sub>16</sub> " to 30"	1 <sup>3</sup> / <sub>16</sub> " to 20"	1 <sup>3</sup> / <sub>16</sub> " to 12"

QUICK  
CLOSING



07

## high integrity pipeline protection system (hipps) SUBSEA

Our HIPP System scope includes **PETROLVALVES'** proprietary design and manufacture of valves and actuators.

SIL figures are evaluated on **PETROLVALVES'** own data base of reliability records constructed from feedback from field operators using our products over many years of service.

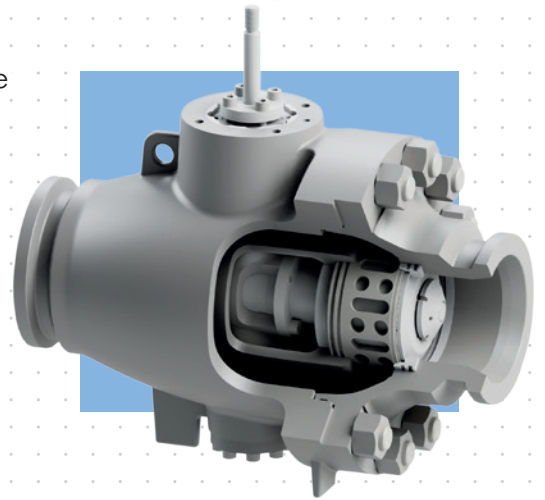
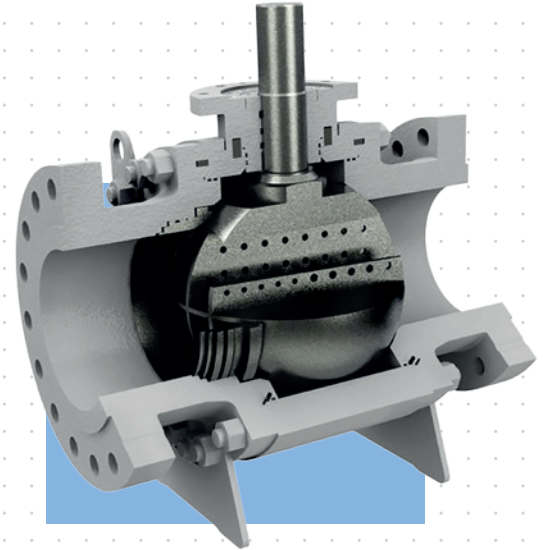
(\*) For non-listed dimensions contact PV's staff

## control valves SUBSEA

**PETROLVALVES** production range includes a large variety of control valve types specifically designed for deep subsea installation and operations.

Control valve designs available include: Globe, Cage Ball (both top entry and end entry construction) and Axial Flow valve.

- ▶ Different trim selections are available to suit the client's required CV curve.
- ▶ Large variety of stem seals available, including Infinity metal stem seal
- ▶ **PV's** technical department can develop designs suitable to meet specific operating performance, including dynamic response.



CUSTOMIZED  
CV CURVE



**PETROLVALVES** has a complete product line of subsea actuators and ROV driven gear boxes to suit any operational requirement. Where envelope dimensional space is limited, posing challenges to considering traditional rack and pinion designs, we have as an option, space saving helical spline designs. Our actuators are able to be incorporated with diver or ROV retrievability for safely retrieving of the entire actuator assembly for maintenance, should over-pressurization of the cylinders occur, or external damage from sinking objects striking the installed equipment. Further, **PV** have a patented Subsea Electric Actuator for our clients' consideration.

Rev 01 - June 2016 - Please visit our website [www.petrolvalves.com](http://www.petrolvalves.com) to get the latest revision.

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