



## SWING CHECK VALVES

valves and actuators

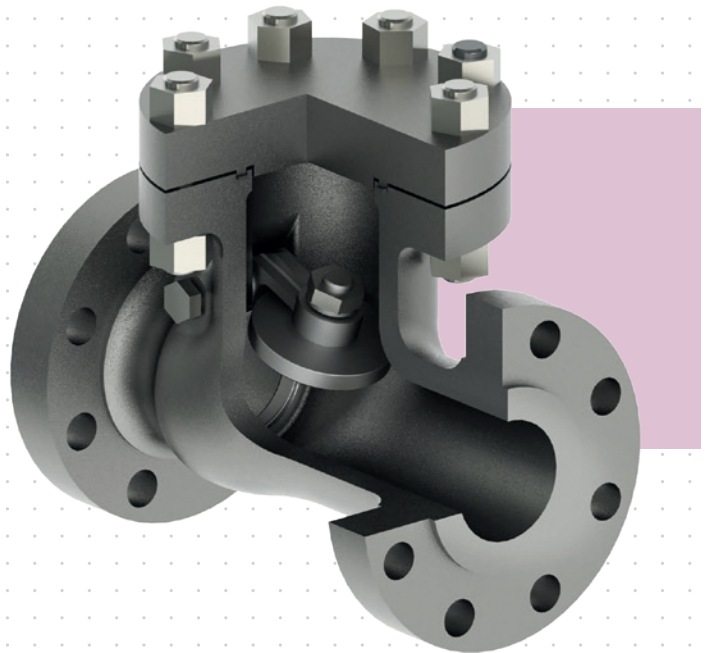
## introduction

**PETROLVALVES** is a leading manufacturer of valves for the oil and gas industry. Formed in 1956, **PETROLVALVES** has grown to a company with sales, services and manufacturing facilities throughout the world with direct presence in the United States, Norway, United Kingdom, Italy, Singapore and Australia.

The continuous investment in development of new technology has resulted in the growth and ongoing success of our company. **PETROLVALVES** line of production includes some of the most sophisticated valve products in the world with a strong focus on the development of custom or niche products designed according to customer's specific requirements.

**PETROLVALVES** has been manufacturing swing check valves since the late 1960s being an early participant in the biggest oil&gas projects.

**PETROLVALVES** experience in the swing check valve design grew faster and faster, driving the company to challenge itself with more and more complex products, such as large diameters i.e. 48" class 600 and 44" class 900.



## swing check valves

### BASIC INFORMATION

Standard service: use in natural gas, LNG, crude oil, refined products transmission lines as well as in many other general industrial and oil&gas applications.

For example:

- ▶ Transmission pipelines
- ▶ Pumping, compression and reinjection units
- ▶ Offshore platforms,
- ▶ Onshore terminals,
- ▶ Pig traps
- ▶ Measuring stations
- ▶ Surge-relief skids
- ▶ Blowdown

	DESIGN	PRESSURE CLASS	MODEL
SWING CHECK TYPE	BOLTED BONNET	API 6D	103
	BOLTED BONNET API 6A	API 6D	923
	SPLIT BODY	API 6D	153
	PRESSURE SEAL	API 6D	160

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### SPECIAL SERVICE

- ▶ HIGH/LOW TEMPERATURE
- ▶ CRYOGENIC
- ▶ DIRTY / ABRASIVE SERVICE
- ▶ BURIED

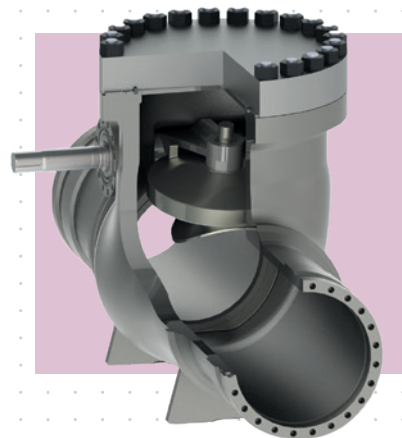
RANGE OF PRODUCTION ( * )				
API 6D class SIZE	150 to 600 up to 48"	900 up to 44"	1500 up to 30"	2500 up to 16"
API 6A class SIZE	API 3000 up to 44"	API 5000** up to 30"	API 10000 up to 16"	API 15000 up to 10"
(*) for non listed dimensions contact PV's staff				

## swing check valves DESIGN FEATURES

MAIN DESIGN FEATURES	SPECIAL FEATURES
<ul style="list-style-type: none"> <li>▶ General design API 6D or API 6A</li> <li>▶ Face to face dimensions ASME B16.10</li> <li>▶ Flange design ASME B16.5 and ASME B16.47</li> <li>▶ Butt welding design ASME B16.25</li> <li>▶ Fire safe design</li> <li>▶ Anti blow out stem</li> <li>▶ Fully maintainable on line</li> </ul>	<ul style="list-style-type: none"> <li>▶ NACE Requirement</li> <li>▶ Full/partial cladding</li> <li>▶ Ad hoc engineering to suit customer projects requirements</li> <li>▶ Pigging guide</li> </ul>

**PETROLVALVES** engineering department is specialized in fulfilling all customer's requirements and project specification. The most important feature of Top Entry design is: **"FULLY MAINTAINABLE ON LINE"**

Complete valve maintenance is extremely quick and safe: access to the main components of the valve only requires removing the bonnet.



## materials

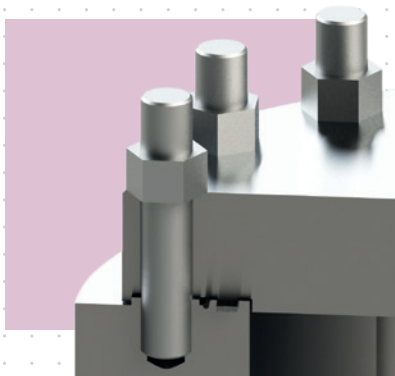
**PETROLVALVES** swing check valves have been designed for use with various combinations of materials which are selected to better suit service conditions

AVAILABLE BODY MATERIAL SELECTION	AVAILABLE OBTURATOR MATERIAL SELECTION	AVAILABLE SEAT MATERIAL SELECTION
<ul style="list-style-type: none"> <li>▶ CS, LTCS (*)</li> <li>▶ Low Alloy Steel (*)</li> <li>▶ Stainless Steel</li> <li>▶ Duplex /Superduplex /Ni Alloy</li> </ul> <p>(*) CRA weld overlay option available</p>	<ul style="list-style-type: none"> <li>▶ CS, LTCS (*)</li> <li>▶ Low Alloy Steel (*)</li> <li>▶ Austenitic / Ferritic / Martensitic Stainless Steel</li> <li>▶ Duplex /Superduplex /Ni Alloy</li> </ul> <p>(*) CRA weld overlay option available</p> <p><b>Option</b></p> <ul style="list-style-type: none"> <li>▶ Stellite / Electroless Nickel plating</li> </ul>	<ul style="list-style-type: none"> <li>▶ CS, LTCS</li> <li>▶ Low Alloy Steel</li> <li>▶ Austenitic / Ferritic / Martensitic Stainless Steel</li> <li>▶ Duplex /Superduplex /Ni Alloy</li> </ul> <p><b>Option</b></p> <ul style="list-style-type: none"> <li>▶ Stellite / Electroless Nickel plating</li> </ul>

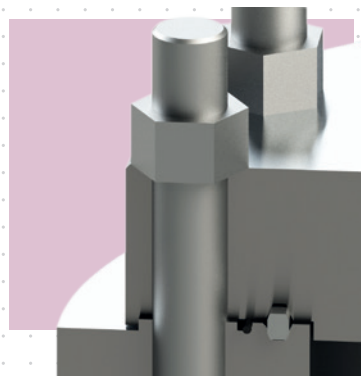
## sealing DESIGN

### BODY SEALING

All primary body gaskets are metal to metal, **spiral wound type** or **ring joint type**.



up to class 600



from class 900 up to class 4500

Available upon request:

Secondary soft gasket to introduce a redundant barrier

### SHAFT SEALING

Gas threaded plug with metal gasket

Available upon request:

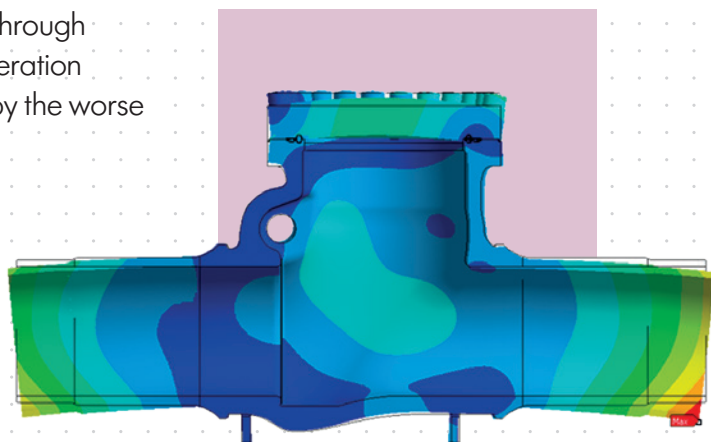
- ▶ PTFE Chevron type
- ▶ O-ring sealing
- ▶ Graphite sealing
- ▶ Metal-to-metal stem seal in series to the standard thermoplastic seals.
- ▶ Redundant elastomeric (AED) stem gasket
- ▶ Bolted shaft closure flange with metal or elastomeric gasket
- ▶ No hinge pin retainer



## body, bonnet AND BOLT DESIGN

Body, bonnet and bolts design is performed, through means of latest FEM codes, taking into consideration stresses and displacements induced in valve by the worse combination of loads, that includes:

- ▶ Both internal and external pressure
- ▶ Axial thrust and bending moment coming from the line
- ▶ Stresses induced by non uniform thermal distribution in the valve wall

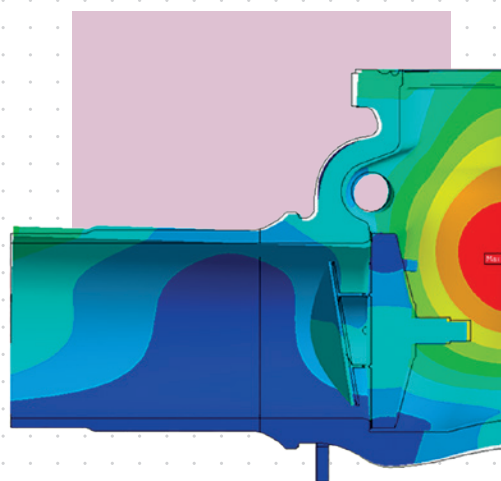


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## seat to obturator DESIGN

### METAL SEAT

Manufactured with the help of the most updated technologies to find the optimal geometric configuration of the obturator and the seat ring in order to achieve a perfect seal. Numerical simulations are carried out to optimize any project solution.

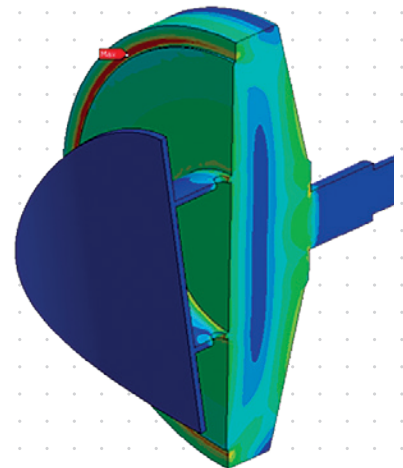
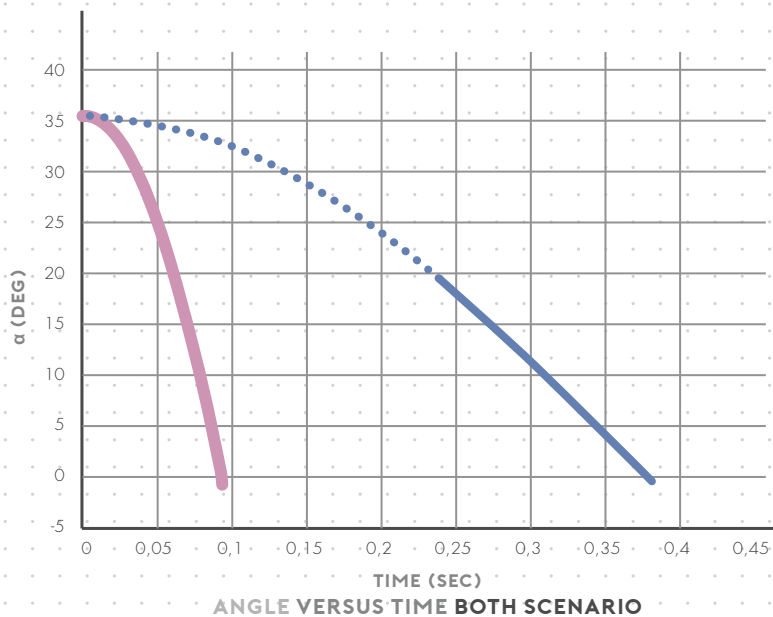
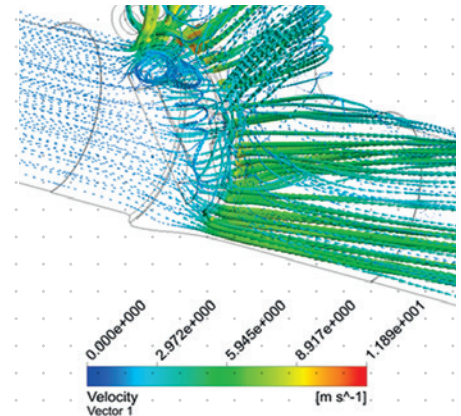


## fluid dynamics CALCULATIONS

Fluid dynamics simulations are run to optimize flux parameters such as pressure drops,  $C_v$  calculations, noise levels, fluid dynamics forces. The use of finite element analysis with the most advanced codes allows to achieve the desired solutions in shorter times and with higher levels of precision.

Simulation of 'pipe break' are carried out on request in order to simulate:

- ▶ Evaluation of clapper closing time in the event of pipe rupture
- ▶ Evaluation of valve capability to withstand the quick closure of clapper consequent to the pipe rupture



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**MANUFACTURING PLANT**

Viale G. Borri, 42

21053 Castellanza (VA), Italia

**P** +39 0331 334111

**W** [petrolvalves.com](http://petrolvalves.com)