Through Conduit Double Expanding Gate Valve

Technical brochure

AMPO
POYAM VALVES

Commitment made of steel

COMPANY PROFILE

AMPO is an **international leader** with over 50 years of experience in the design and manufacture of **highly engineered valve solutions** for the most severe applications across a wide variety of industry sectors.

Fully inhouse manufacturing process

Worldwide references

Project based on people

Innovative spirit

700+ people

In more than 60 countries

Most important partners in the industry

Cutting edge technologies

Our commitment: the best service

Customer focus

Since 1964

INDUSTRY SECTOR

AMPO's Through Conduit Double Expanding Gate valves are engineered to fulfill severe service applications where reliability and safety are both ours and our clients primary concern:

- Offshore / Onshore applications
- Double block and bleed applications (DBB)
- Double isolation and Bleed applications (DIB-1)
- Scrapers / Pig Traps / Pig Launchers and Receivers
- Oil and Gas production / transportation isolation
- Upstream Gas compressor isolation
- Critical and primary isolation

Our customised solutions and robust designs create complete reliability due to their optimum performance.

THROUGH CONDUIT DOUBLE EXPANDING GATE VALVE

AMPO POYAM VALVES Double Expanding Gate valve is a metal to metal highly engineered valve to guarantee reliable tight shut off during a long service life.

Standard:

API 6D, ASME B16.34, ASME B16.5, ASME VIII Div 1 & Div 2, NACE MR0103.

Sizes and pressures:

600#	900#	1500#	2500#
6" up to 48"	6" up to 48"	6" up to 42"	6" up to 24"

** Other sizes and pressure ranges on request.*

Design features:

- Valves are designed without elastomeric or thermoplastic gaskets.
- Load fluctuation during the service life are considered in the design in order to guarantee long service life and operation.
- Expanding gate are available as or double expanding design, Double Isolation and Bleed valve in both close and open positions and Single expanding gate Double Isolation and Bleed in close position.
- Specific through conduit valves design for a dirty service.
- Double Block and Bleed (DBB) in CLOSE and/or OPEN positions.
- Double Isolation and Bleed (DIB-1) in CLOSE and/or OPEN positions.
- Fire Safe.
- Fully Piggable valve.
- Antistatic design.
- Rising Stem design.
- Various end connections are available.

Sealing:

- Bi-Directional sealing design.
- Sealing is reached by mechanical thrust without the need to pressure energize the sealing components.
- The sliding sealing surfaces are completely hard face with tungsten carbide.
- Metal to metal sealing achieved by tungsten carbide hard facing on both the gate and seats.
- Double stem packing sealing solution provided.
- Tight sealing in Open and Close positions.

Actuation:

- Manual
- Electric
- Pneumatic
- Hydraulic

Other features:

- Materials are selected correctly to guarantee mechanical and corrosion resistance taking into account extreme service conditions and sour service NACE requirements.
- CRA weld overlay available in-house, partial or fully clad for corrosion protection.
- Single expanding designs are available upon request.
- Customized bores are available on request.
- External vent and drain are available.
- Stem injection ports for extra sealing are available.

WHY CHOOSE OUR THROUGH CONDUIT DOUBLE EXPANDING GATE VALVE?

LOW OPERATION TORQUE
provides ease of operation due the inherent design of the valve.

Nxm

True double block and bleed **(DBB)**

DBB

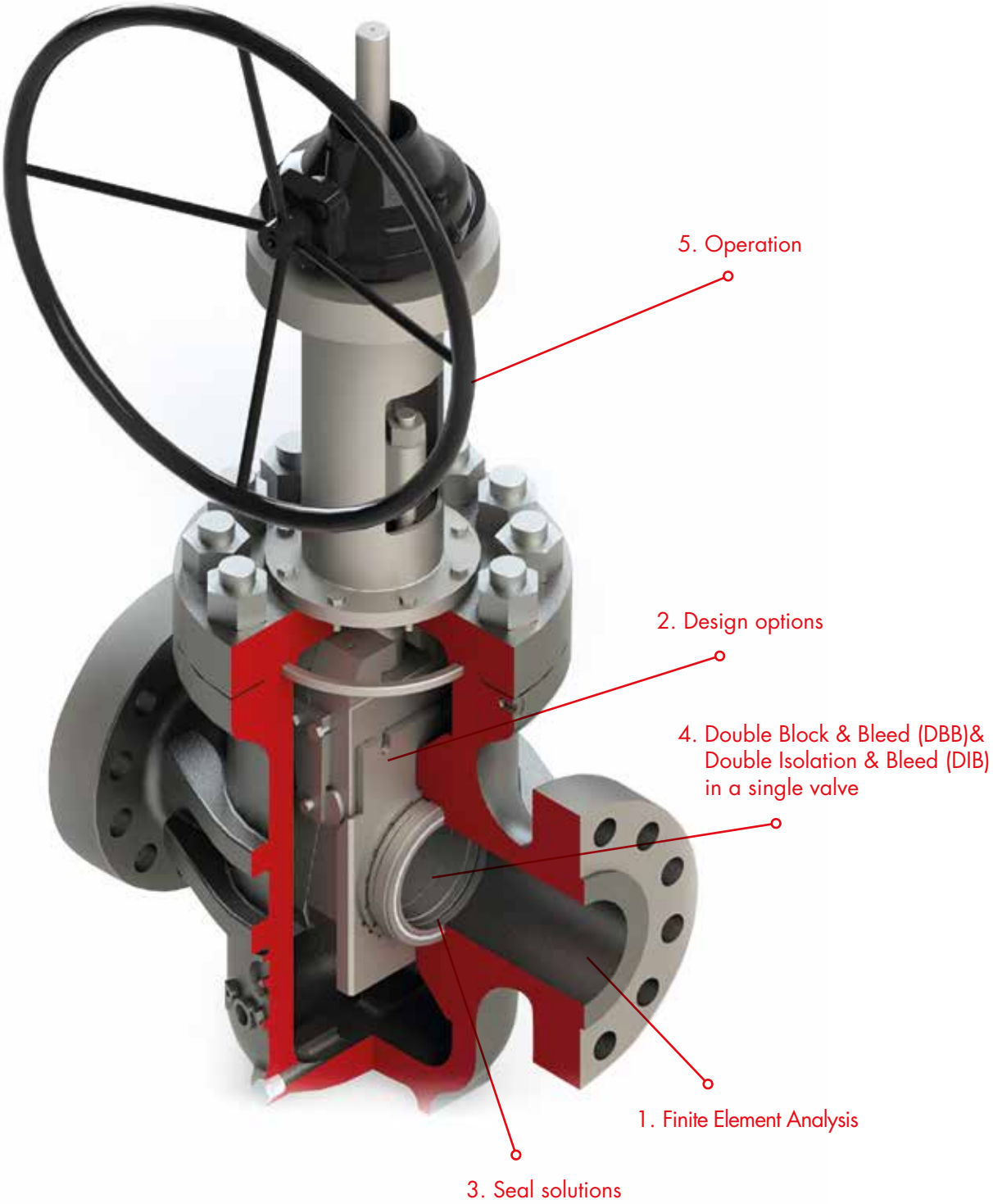
MECHANICAL STOPS
prevent damage due to over-torque.

STOP

MINIMUM MAINTENANCE:
AMPO POYAM VALVES' Through Conduit Double Expanding Gate Valve is designed to maintenance free operation between turnarounds.

A GUIDED DESIGN permits the valve to be installed vertically or horizontally and for high pressure differentials.

TECHNICAL FEATURES

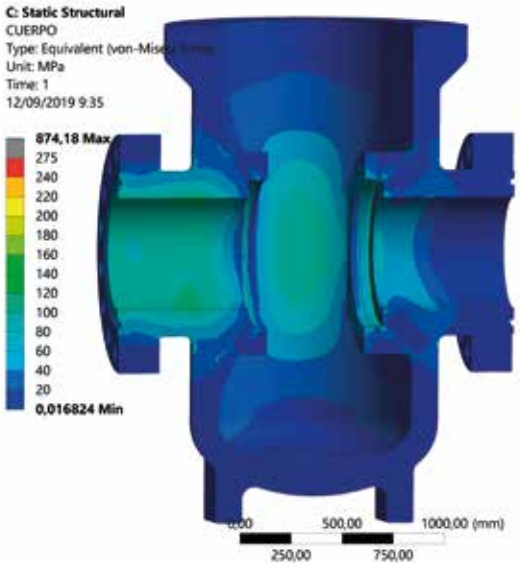


1. FINITE ELEMENT ANALYSIS (FEA CFD):

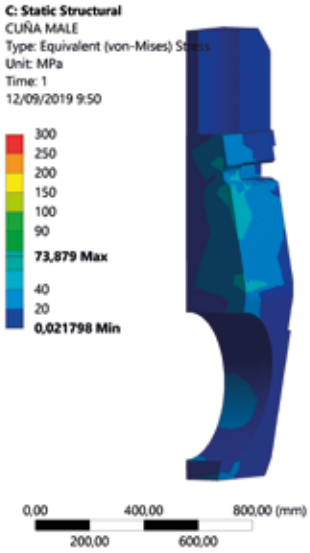
Structural integrity of each pressure containing component and pressure controlling components are validated with advanced FEA simulation tools that assure the correct performance of each component ensuring long life service and ultimately a robust valve design.
CFD is used to verify fluid dynamic performance.

Valve assembly sealing performance is engineered for operating load combinations applied. Valve operation is verified when the maximum operating load combination from the connected piping is applied. FEA report demonstrated by the analysis of bending moments, pressure effects, external loads, thermal analysis, thermo mechanical analysis and functional verification are available on request.

FEA ANALYSIS FOR BODY AND BONNET:

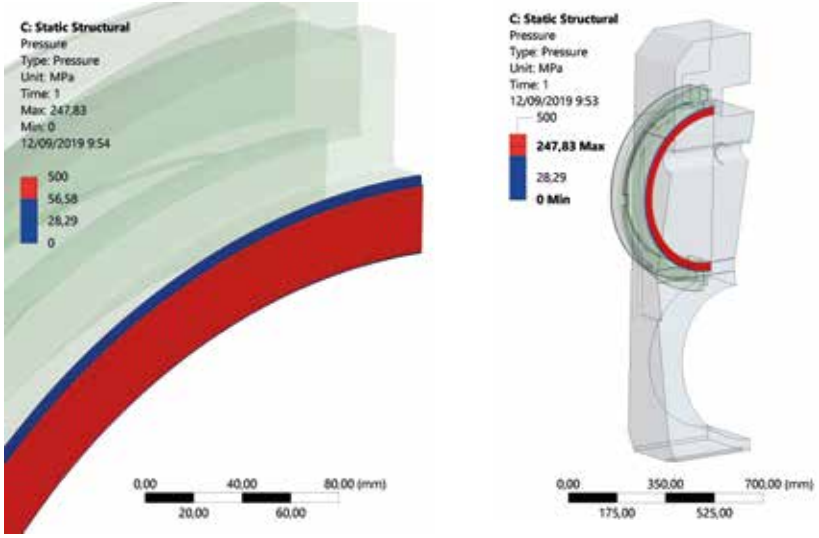


FEA STATIC/STRUCTURAL ANALYSIS FOR GATE:



Wedge static structural analysis

FEA PRESSURE CONTACT ANALYSIS TO ENSURE THE CORRECT SEAL:



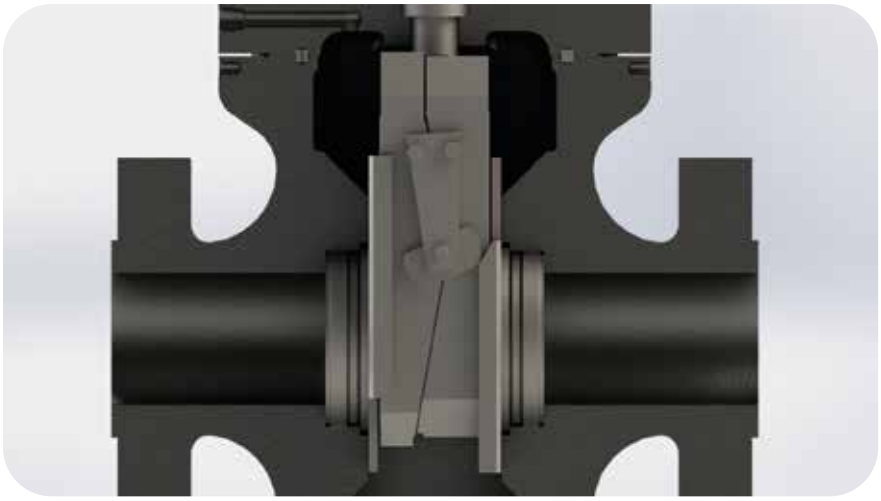
Contact pressure distribution between wedge and seat

2. DESIGN OPTIONS:

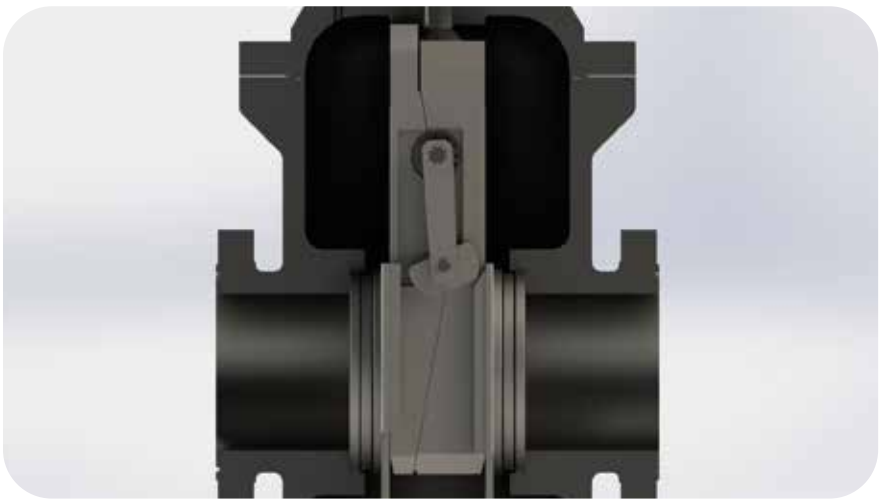
Depending on size and pressure there are different slide expanding alternatives:

SPRING DESIGN

LEVER DESIGN



CAM DESIGN



3. SEAL SOLUTIONS:

SEAT SEALING RELIABILITY

AMPO POYAM VALVES Through Conduit Double Expanding Gate valve is a metal to metal valve, with no elastomer or thermoplastic gaskets, designed to guarantee a high reliable tight shut off during a long service lifetime.

The dynamic sealing surfaces between seats and gates are hard face with Tungsten Carbide, complete with a special surface finish to reach and maintain the tight shut at high pressure and with dirty and abrasive suspension medium.
The internal surfaces of the gates are also coated with tungsten carbide to avoid galling during service.
The seat tight shut off is maintained without need to inject any sealant compound.

FEA based engineered designed seats with the additional Hard-faced metal to metal sealing surfaces provide a reliable sealing performance.
Different sealing technologies are available and all of them are engineered with FEA analysis.

GATE

MALE

SEATS

FEMALE

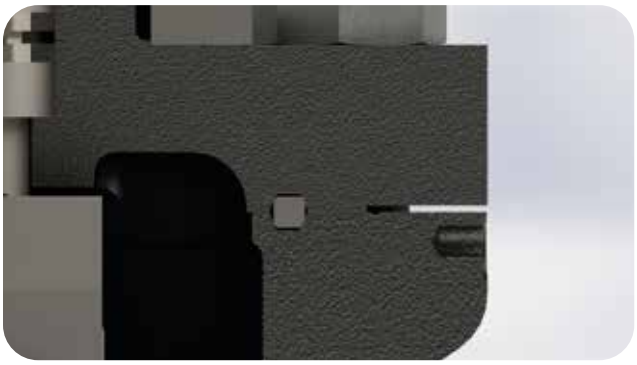
Seats are Tungsten Carbide HVOF coated with Metal to Metal contact between seats and gate.

Gates are Tungsten Carbide HVOF coated with Metal to Metal contact in their internal and external surfaces.

SEALING TO THE ATMOSPHERE

Different bonnet sealing solutions are available. Typically, spiral wound type and ring joint type are used. More sealing solutions are available upon request.

Spiral Wound type sealing solution

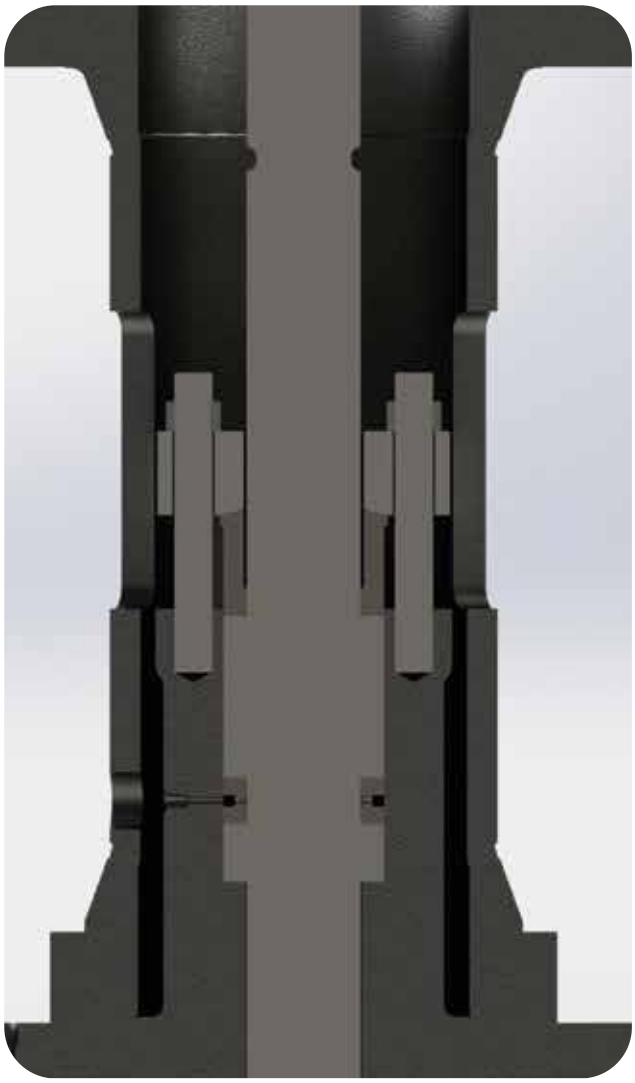


BX type sealing solution

STEM SEALS

The AMPO POYAM VALVES Through Conduit Double Expanding Gate valves stem seal design has a double barrier system. Includes at least two seals to prevent ingress of fluid. Double stem barrier seal comprises high-density graphite packing separated by a metal ring. A lantern ring may be provided with a secondary injection fitting. Stem packing is adjustable from the outside.

Further dynamic sealing solutions are available.



Double Barrier Graphite Packing separated by metal ring

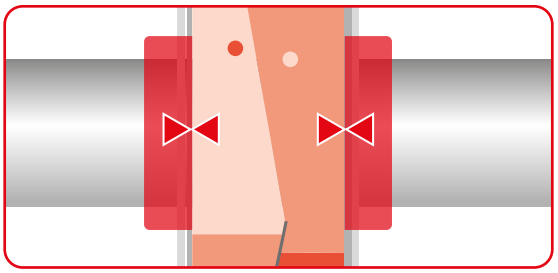
4. DOUBLE BLOCK AND BLEED (DBB) & DOUBLE ISOLATION AND BLEED (DIB) IN A SINGLE VALVE:

- AMPO Through Conduit Double Expanding Gate valve with threaded seat design is the preferred option where Double Block and Bleed or Double isolation and Bleed is required and additionally it is achieved in a single valve.

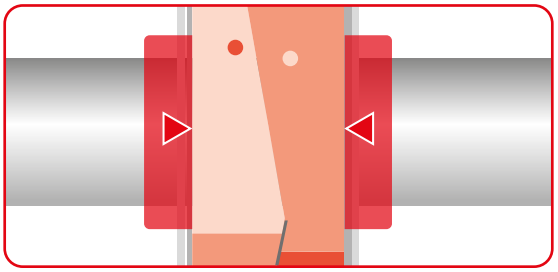
- Each seat is self-energizing, the safest DBB and DIB configurations that can be obtained in a single valve.

- It is mechanically activated and does not depend on internal pressure (piston effect) to activate the seats. Ball valves and Slab Gate valves are not self-energizing and they use the internal piston effect to activate the seats and are dependent on internal pressure.

DIB



DBB



DESCRIPTION	STANDARD FEATURES	DBB	DIB	SELF ENERGIZING
Floating ball valve	Bidirectional downstream sealing	NO	NO	NO
Cavity self-relieving ball valve with vent	Bidirectional upstream sealing	YES	NO	NO
Ball valve with double piston effect seats on both sides	Bidirectional upstream and downstream sealing	YES	YES(1)	NO
Ball valve with double piston effect seat one side, cavity relieving seat on the other side	Bidirectional upstream and downstream sealing	YES	YES(1)	NO
Expanding gate valve with fixed or floating seats	Bidirectional upstream and downstream sealing	YES	YES	YES
Slab gate valve with bi-directional seats	Bidirectional upstream and downstream sealing	YES	YES	NO

(1) Depending on location etc. ball valve has lower integrity than expanding gate and slab gate valve and should not be considered as DOUBLE ISOLATION VALVES unless the cavity between the seats can be bleed-down in service and the sealing integrity of the two seats can be verified in service.

5. OPERATION:

Through Conduit double expanding gate valve is designed with two slides, one female and one male slide. Between the two slides there is a mechanism that allows different operating positions.

- **CLOSE OPERATION:** The mechanism allows the slides to expand and causes a positive sealing against the valve's seats.
- **DURING TRAVELLING:** Slides are free of friction because of the mechanism. There is no contact with the seat sealing faces, there is no wear mechanism.
- **OPEN POSITION:** The valve internal design allows a full-bore conduit for a pigging service. Mechanism allows the expansion of the slides creating positive sealing between the seats and between the slides avoiding fluid going through the cavity.

OPEN **TRAVELLING** **CLOSE**

Slides are guided. These guides allow to the arm to rotate avoiding the gate expansion in open and close positions.

AMPO POYAM VALVES Through conduit double expanding valves isolate on both downstream and upstream seating surfaces and are designed to tighten in open and close positions. Mechanical positive sealing is applied against pressure action.

UPSTREAM PRESSURE SEALING/DOWNSTREAM PRESSURE SEALING (CLOSE POSITION)

CLOSE AND OPEN POSITION

CAVITY ISOLATION IN OPEN AND CLOSE POSITION

CAVITY & UPSTREAM/DOWNSTREAM ISOLATION IN CLOSE POSITION

QUALIFICATION

AMPO values quality and therefore our operating and production processes are implemented and controlled by a quality assurance system, certified since 1991 under the ISO 9001 Standard, API Spec Q1&6D, API 6DSS, API 6A&17D and SIL 3 and accredited by various independent third part inspection agencies, such as Lloyd's Register, Bureau Veritas (BV), Det Norske Veritas (DNV) and American Bureau (ABS).

We are equipped with modern testing facilities and highly qualified Internal Quality Control Personnel to ensure the reliability of our valves. We carry out Non-Destructive Testing such as X-ray, Dye Penetrant, Ultrasonic Test, Magnetic Particle and PMI (Positive Material Identification), Impact Tests, Visual inspections, Hydrostatic Tests, Pneumatic Tests, Low Temperature and High temperature Tests, Fugitive Emission Tests, Vacuum Tests, High Temperature Tests, High Pressure Tests, etc.

Our management is completely based on the strictest quality standards, which is the foundation to enable AMPO to develop the product which best satisfies our customer.

The standard testing procedure of our Through Conduit valve is based on the API 598.

To assure the AMPO POYAM VALVES quality, all tests specified on the standard are performed as mandatory, even the optional ones such as High Pressure Closure tests.

Fugitive Emission Class A standard design is achieved on these valves following ISO 15848. API 641 fugitive emission compliant valve can be offered as an option as well. Client specific specifications can also be incorporated upon request.

All the painting works are performed fully in house, and special requirements for high temperatures or adhesions tests are available for special processes.

MATERIAL SELECTION

PRESSURE CONTAINING COMPONENTS - FORGED OR CAST

Carbon steel, low alloy steel, stainless steel, duplex, super duplex and Inconel

PRESSURE CONTROLLING COMPONENTS – FORGED

Stainless steel, duplex, super duplex, nickel-based alloys
Hard Facing – Tungsten Carbide, Stellite

CLADDING CAPABILITIES

CRA weld overlay available in-house, partial or fully clad.

AMPO SERVICE

AMPO SERVICE are available to provide commissioning and life of field support to our clients.
Our experience and high trained service technicians in conjunction with our resources based locally and from our headquarters we can provide industry leading levels of support and guidance.

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