

control technology

evolia



For	Liquids	Gas	Multi-Phase Fluids
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Oil & Gas



LNG



Pipeline



evola combines advanced technology and an open mind for determining it's product design.

Since our inception in 2001, our goal has been to develop a leading edge patented product that will form an integral part of our close working relationship with our clients. We commit ourselves to ensuring that our client support consistently delivers the highest standard for the industry we serve.

Innovative technology and new product development are extremely important to evola. This focus allows us to offer significant advantages to our clients today and also secures this advantage into the future.

Products – control ball

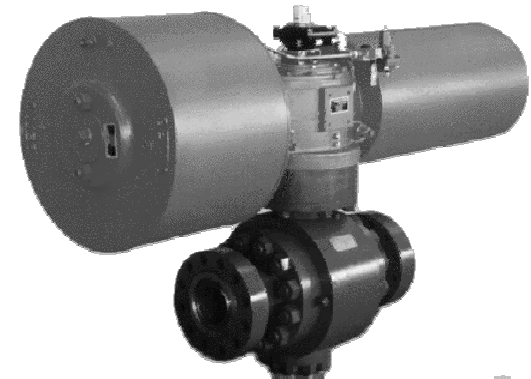
We have established that the oil & gas processing market requires solutions that delivers increased benefits. With this in mind evola developed the *control ball* which is a patented design (10/873,147) for a product that did not exist. Numerous criteria went into the definition and selection of the final product.

Understanding the difficulties presented by the current products in various applications throughout the gas industry we believe that our product has the flexibility and scope to significantly enhance our clients operating performance.

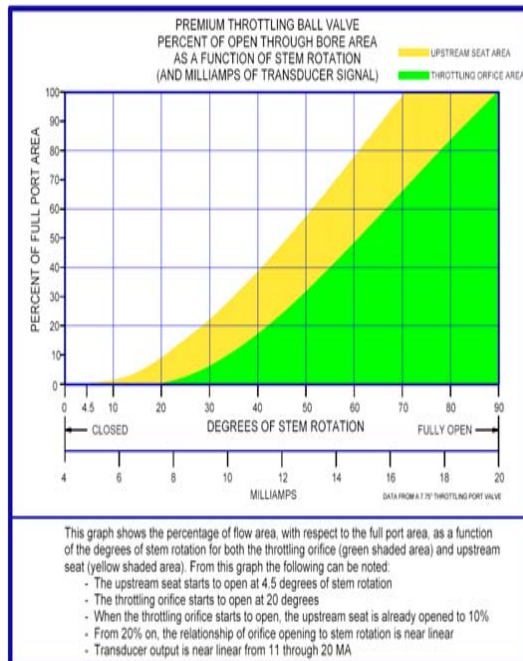
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Pipelines



control ball – reduces noise & vibration



Control Ball Benefits :

evola has developed a leading edge velocity control rotary valve for gas applications. With it's unique ball design, **control ball** offers a multi-stage pressure reducing ball in conjunction with the **control seat** offers a soft or metal seat with precise flow control.

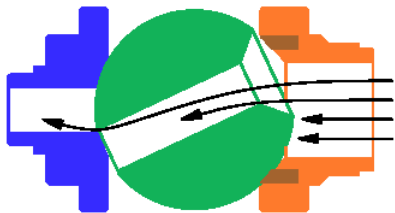
This valve offers technology to the Gas industry usually only found in rising stem globe control valves or regulators.

The advantages of this product over conventional globe valves are :

- Less risk to fugitive emissions
- Larger C_v size for size
- Lower weight
- Easier maintenance
- Lower cost



Control Seat



Throttled Flow Start

After the upstream seat is opened to avoid high velocity flow across the seat seal, the throttling orifice starts to open and flow begins.

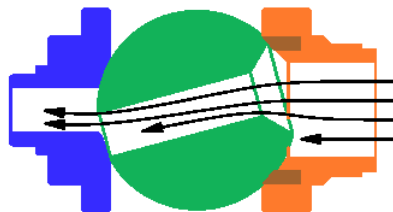
Seat design is a unique part of *control ball's* overall design capabilities.

Control Seat can be utilised for control and shut-off thus enabling the the *control ball* valve to act as the control and isolation valve

The downstream seat can be profiled to give unique characteristics – linear to modified equal %

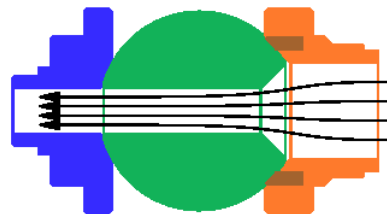


12" Cryogenic Valve with Control Seat



Throttled Flow

The throttling orifice can be regulated to achieve the flow rate desired with insignificant impact on the upstream seal.

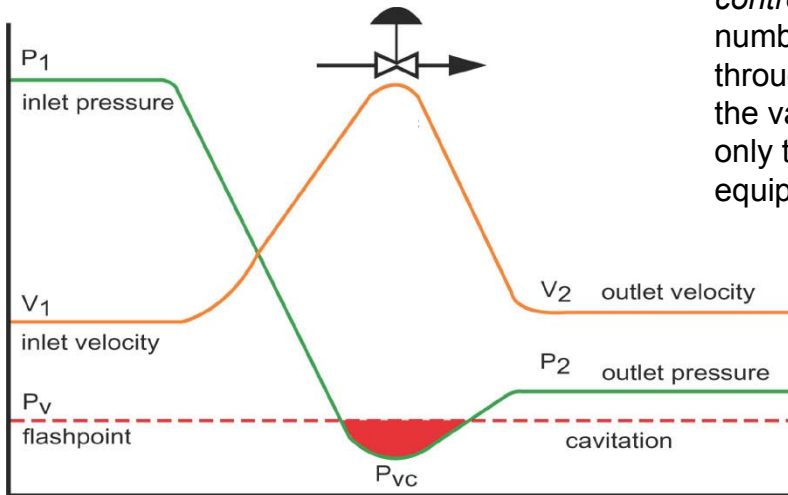


Ball Fully Open - Full Flow

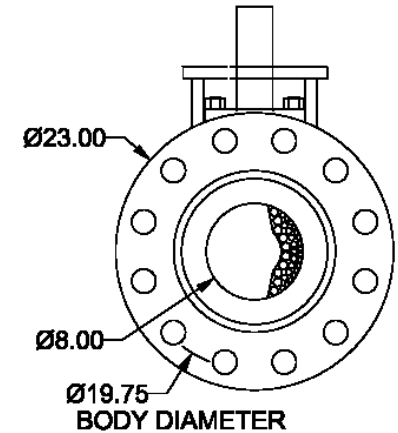
Maximum flow through the valve with minimum turbulence is achieved in the full open position. In this position the upstream seat seal is protected from the flow stream.



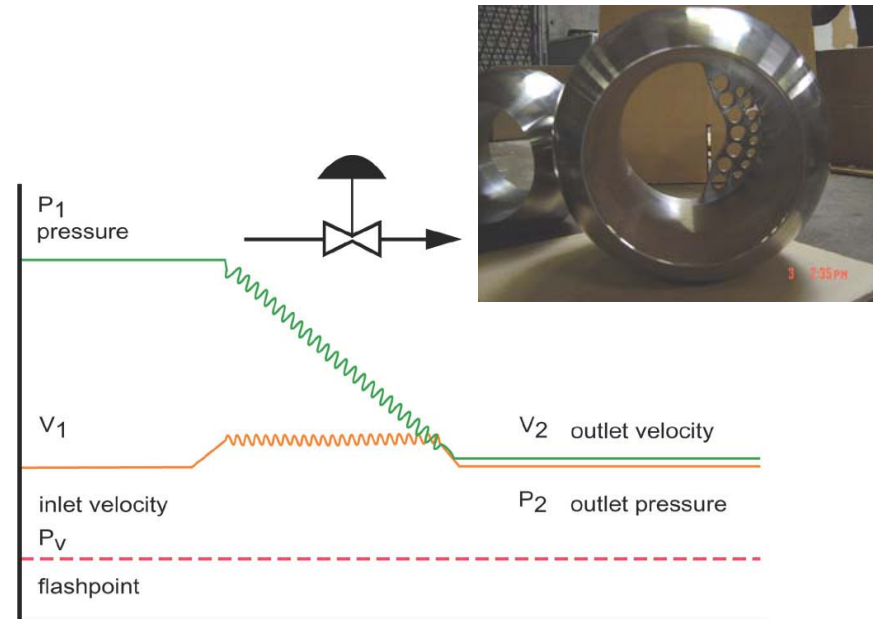
control ball – eliminates cavitation



control ball – can reduce the pressure over a number of pressure letdown stages located throughout the ball stop the fluid falling below the vapour pressure and thus protecting not only the valve but downstream pipe and other equipment.



If the pressure at the point of pressure reduction goes below the liquids vapour pressure then bubbles are formed. If the subsequent pressure recovery to P_2 exceeds the fluids vapour pressure the bubbles subsequently collapse or implode this is called Cavitation



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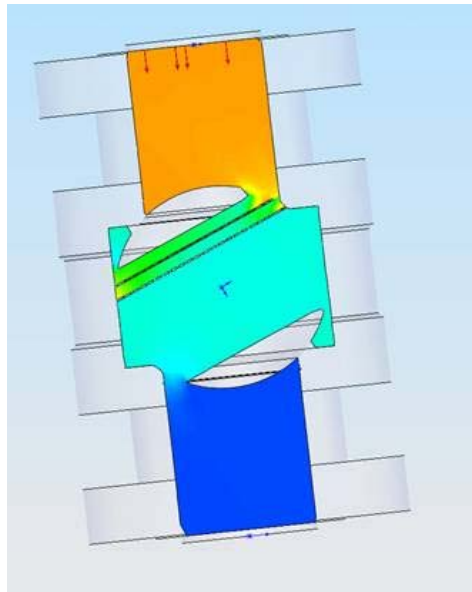
Pipelines



evola – scope of supply

Using the very latest 3D solid modelling with CFD (Computer Flow Dynamics) and FEA (Final Element Analysis) evola are able to design specially engineered products that meet the precise requirement of the application – with confidence.

24" ANSI 1500# Control Ball – Spherical impingement



		Valve Nominal Bore (inches)																							
		1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
ANSI Pressure Class	150																								
	300																								
	600																								
	900																								
	1500																								
	2500																								
4500																									
Trim Types	Reduced Port																								
	Full Port																								
	Floating Ball																								
	Trunnion Mounted																								
	Control Seat																								
	Control Ball																								
Process Temperatures Types	Cryogenic																								
	-10°C to 220°C																								
	Above 220°C																								
	Gas																								
	Liquids																								
	2 & 3 Phase Flow																								
Solids																									
Actuators	Pneumatic																								
	Electric																								
	Hydraulic																								
	Gas Over Oil																								
Actuator Systems	Standard Accessories																								
	Emergency Shut Down																								
	Modulating 4/20 to Fieldbus																								
	Partial Stroke System																								
Body Materials	A105																								
	F22																								
	F91																								
	A182 F316																								
	A182 F304																								
	Duplex																								
	Super Duplex																								
	Monel																								
	Hastelloy																								
	Bronze																								
Al Bronze																									
Ball & Seat Materials	A182 F316																								
	A105																								
	17-4-PH																								
	ENP 0.002"																								
	Stellite Overlay																								
	Monel																								
	Hastelloy																								
	Incoloy																								
	Tungsten Overlay																								
	PTFE / RTFE / PEEK																								
Ceramic																									

SCOPE OF SUPPLY.
 NO PRODUCT OFFERINGS.
 UNDER DEVELOPMENT AND PRICES CAN BE GIVEN

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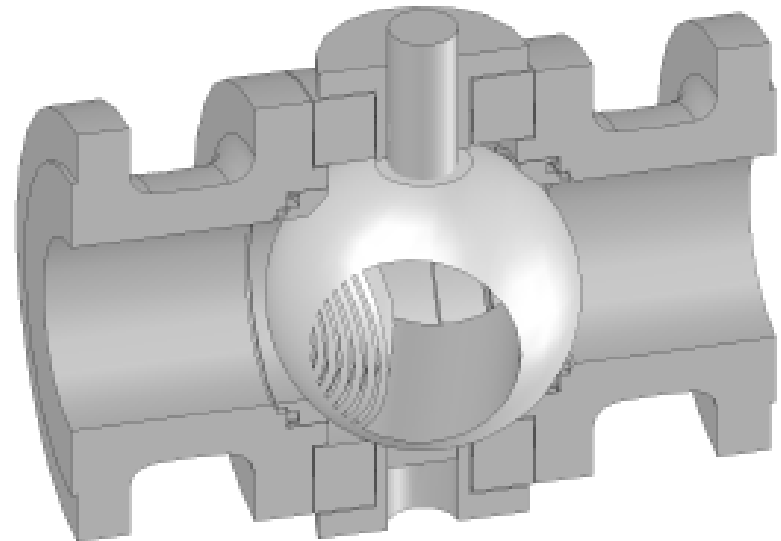
Pipelines



Patent No. 10/873,147

control ball – eliminates cavitation

evola's *control ball* technology has multi stage pressure reduction to control pressure letdown and avoid cavitation. The unique design allows a fluid to pass through the spherical plates creating right angle turns progressively lowering pressure through the stages controlling the pressure drop at each stage avoiding cavitation and erosion. *control ball* can be configured to suite the requirements of each application.



Precise flow control

control ball is custom designed to meet the numerous applications throughout the oil & gas processing industry. With it's precise control and high rangeability control ball will enhance plant performance in applications such as :

Liquid - Metering | Pipelines | Pumping Stations | Well Injection | Emergency Shutdown | HIPPS

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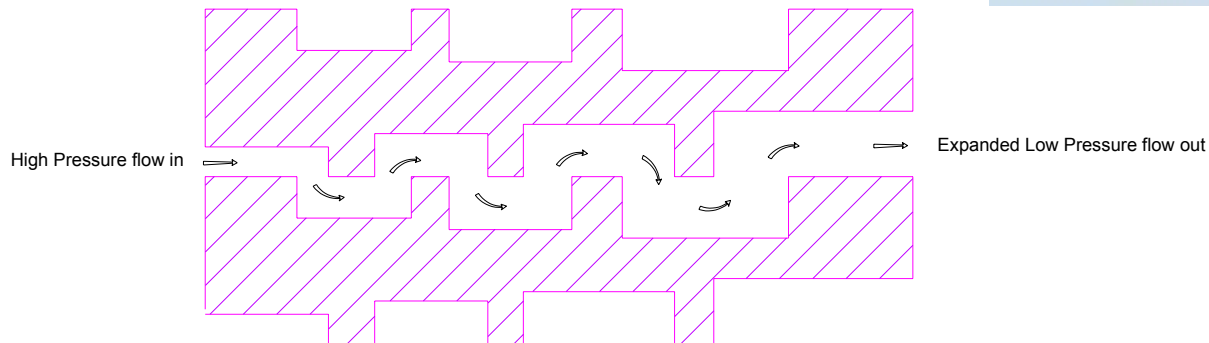
Pipelines



Patent No. 10/873,147

control ball – reduces noise & vibration

evola's *control ball* technology has multi stage pressure reduction to control velocity and eliminate noise. The unique design allows a fluid to pass through a labyrinth of right angle turns progressively lowering pressure and limiting velocity thereby controlling noise, vibration and erosion. *control ball* can be configured to suite the requirements of each application.



CONTROLLED VELOCITY / NOISE / VIBRATION / EROSION

Precise flow control

control ball is custom designed to meet the numerous applications throughout the gas processing industry. With it's precise control and high rangeability control ball will enhance plant performance in applications such as :

Gas - Blending | Distribution | Metering | Mainline Interconnects | Pressure Reduction | Mainline Feeds

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Pipelines

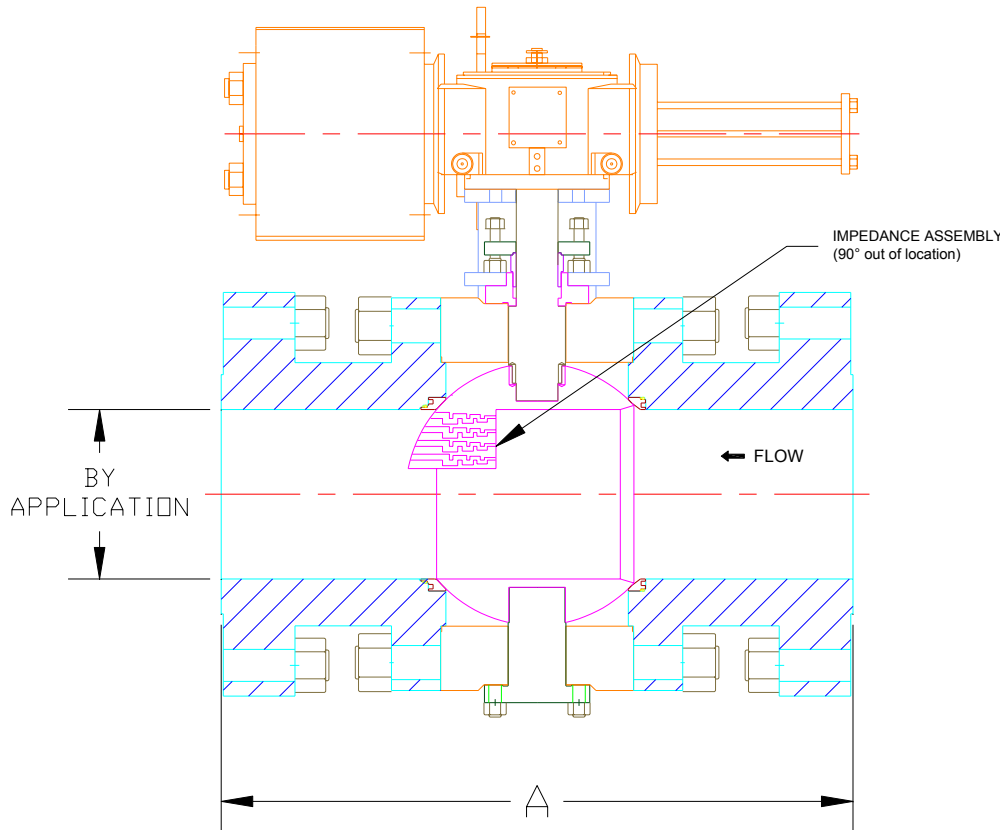


Patent No. 10/873,147

control ball - spherical flow impingement

control ball - multiple turn impingement

typical dimensions



Valve Size	A – ANSI 600	Rated C _v
4 ins (100)	17 ins (432)	200 to 600
6 ins (150)	22 ins (559)	600 to 1450
8 ins (200)	26 ins (660)	1000 to 2150
10 ins (250)	31 ins (787)	1500 to 3500
12 ins (300)	33 ins (838)	2100 to 4950
14 ins (350)	35 ins (889)	2500 to 6000
16 ins (400)	39 ins (991)	3400 to 8250
18 ins (450)	43 ins (1092)	4600 to 9600
20 ins (500)	47 ins (1194)	5900 to 12000
22 ins (550)	51ins (1295)	6800 to 13700
24 ins (600)	55 ins (1397)	8350 to 17250

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actuator control systems

evola can design/supply/assemble/guarantee

Actuators

pneumatic | hydraulic | electric | gas hydraulic

General Control

control packages to include :

Positioners - 3-15psi | 4/20mA | Smart
Ancillaries - Solenoids | Boosters | Switches
Partial Stroke Test

to meet Eexia | Eexd | Nema 4, 7 and 9



HIPPS

HIPPS – (High Integrity Process Protection System) to ensure the valve will close upon receiving a signal from the process, e.g. as a result of excess pressure. In the oil & gas industry this over pressurisation has been provided by means on mechanical relief valves. These instrumented protection systems include redundancy to ensure the valve is **always** available to close. HIPPS incorporate a logic solver using either 1002 or 2003 voting systems to comply with Safety Integrity Levels (SIL).

The SIL level dictates the Probability of Failure on Demand (PFD) and a significant part of accessing the SIL level for the valve, actuator and each component in the control system failure rate can be measured or calculated, this Mean Time to Failure (MTTF) is given for every component either from life cycle hours, this can be difficult to monitor by the OEM or by the operators own data as published by OREDA. Evola has experience in designing complete HIPPS systems incorporating not only the above by seat detection as well.

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control ball – typical technical specification – liquid | gas | multi phase

Feature	Standard	Feature	Standard
Design Parameters	ASME/ANSI B16.34, B16.10	Rangeability	300 : 1
Fire Safety	API-607	Temperature Rating	-196°C to +575°C
Shutoff class	ANSI Class V or VI	Sour Service	NACE MR-0175
End Connections	Flanged / Weld – BW/SW	ANSI Class	150-300-600-900-1500-2500
Actuation	Pneumatic / Hydraulic / Electric Media Operated	Actuator Accessories	4/20mA / HART / Fieldbus EXD – Position Indicators EXD – Solenoid Valves

Description	Typical Materials Standard	Typical Materials Sour Gas NACE	Materials
Body	ASTM A105	ASTM A350 LF2	ASTM A105
Control Ball	ASTM A105 ENP	ASTM A182 F 316	Tugsten Carbide
Metal Seat *	316 SS with Stellite Overlay	316 SS with Stellite Overlay	316 with Carbide Coating
Soft Seat *	RTFE	~	~
Bolting	B7-2H	B7-2H	B7-2H
Packing	PTFE	PTFE	PTFE

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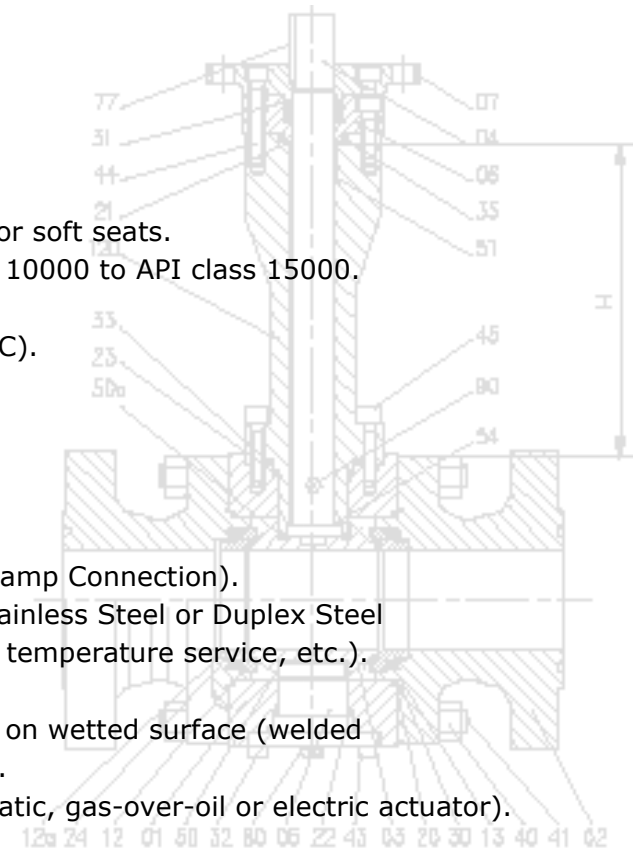


evola – other control technology products

standard ball valves

On/Off Ball Valve Characteristics

- ✓ Trunnion Mounted Ball Valves, with ball hinged on supports and floating metal or soft seats.
- ✓ Pressure range: from ASME Class 150 to ASME Class 4500, and from API Class 10000 to API class 15000.
- ✓ Temperature range: from -46°C to +450°C.
- ✓ On request possibility to use in cryogenic conditions (temperatures up to -196°C).
- ✓ Three Pieces Forged Steel Valves.
- ✓ Low pressure loss through the valve.
- ✓ Low actuation torque.
- ✓ "CE" marking in compliance with PED Directive 97/23/EC.
- ✓ Full Bore or Reduced Bore.
- ✓ Different kinds of end connections (RF/RTJ Flanges, Butt Weld, Socket Weld, Clamp Connection).
- ✓ Wide availability of materials depending on the specifications (Carbon Steel, Stainless Steel or Duplex Steel for service in corrosive environments, Chrome-Molybdenum Alloy Steel for high temperature service, etc.).
- ✓ Materials with anti-corrosion properties according to NACE MR-01.75.
- ✓ On request, seat pocket area overlay, seal area overlay, or completed cladding on wetted surface (welded overlays in Inconel 625, Stainless Steel 316, etc., or Electroless Nickel Plating).
- ✓ Suitable for manual (wrench or gear) or motorized actuation (hydraulic, pneumatic, gas-over-oil or electric actuator).



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Setting Standards