

Ebullated bed and slurry-phase hydrocracking solutions



Proven expertise in hydroprocessing

VELAN

Quality that lasts.

Velan at a glance

History

- Founded in 1950

People

- Over 1,600 employees

Product line

A world-leading range of valves across all major industrial applications:

- High-pressure gate, globe, and check valves
- API standard gate, globe, and check valves
- Metal-seated and resilient-seated ball valves
- Triple offset and dual plate check valves
- API 6D & 6A valves

Including: actuators and steam traps

Quality

Velan holds major applicable approvals:

- ASME N/NPT (since 1970)
- ISO 9001 (since 1991)
- ISO 14001
- ISO 45001
- PED
- IEC 61508 SIL 3 Capable
- GOST/EAC
- API 6A and 6D
- TA-Luft
- Comprehensive quality programs that are compliant with the most stringent industry standards such as: ISO 9001, API Q1, NCA 4000, ASME NQA-1 and 10 CFR 50 Appendix B.
- Velan has been surveyed and audited by leading organizations around the world such as Bureau Veritas, API, ASME, NUPIC, DCMA, and shipbuilding companies.
- Total Process Improvement Program, including Lean manufacturing and Six Sigma

Headquartered in Montreal, Velan has several international subsidiaries.

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Velan: A world leader in valve design, engineering solutions, and manufacturing



NPS 18 (DN 450) Class 2500 severe service Securaseal metal-seated ball valve for an H-Oil® unit in Inner Mongolia. This valve has been in service since 2008 and continues to perform.

Leading the way...

Velan is one of the world's largest manufacturers of industrial steel valves, recognized as a leader in quality and innovation. Founded by A.K. Velan in 1950, our company leverages advanced engineering capabilities and innovation to continuously expand our offering of industrial valves.

Today, Velan gate, globe, check, ball, triple offset, engineered severe service valves and steam traps are installed throughout the world, handling diverse applications in cogeneration, fossil, nuclear power, oil and gas, refining and petrochemicals, chemicals and pharmaceutical, pulp and paper, LNG and cryogenics, marine, mining, water and wastewater, and HVAC industries.

Engineered solutions

Velan's Engineering group has vast experience, sophisticated software, and testing tools that enable us to find solutions to any customer challenge.

Whether it is for valves to handle liquid helium at -458°F (-272°C) in the world's largest particle accelerator at CERN, Geneva; four-way switch coker ball valves to handle one of the refining industry's toughest services; or valves for main steam isolation service in an operating nuclear power plant, Velan has been selected by most of the world's leading engineering construction firms and industrial end users.

A long-standing commitment to quality has kept Velan at the forefront of our market sectors. Velan holds all major industry certifications and approvals. Many prominent companies have established partnerships or global supply agreements with Velan.

Velan uses the latest automation technology, including CNC machines and many special-purpose transfer machines, enhanced by proprietary production techniques. Thanks to a wide range of equipment, we can efficiently handle highly customized orders as well as large production runs.

A global manufacturing leader

Velan is a global company with 12 manufacturing plants strategically located throughout North America, Europe, and Asia. Using the latest automation technology and a wide range of equipment, we can efficiently handle highly customized orders for specialty valves as well as large production runs of commodity valves.

Total quality commitment

Velan is totally committed to offering products and services that exceed customer expectations. All Velan valves are designed and manufactured with an emphasis on low emissions, safety, ease of maintenance and operation, reliability and long service life.

After sales service support

Velan products can be serviced by our experienced field service technicians, call +1 514 748-7748.

Velan metal-seated ball valves in ebullated bed and slurry-phase residue hydrocrackers worldwide

For refiners around the globe, conversion of heavy oil remains a significant financial factor. As the world calls for lighter fuels as naphtha and middle distillates of crude oil increase, sources of unusual oil and heavy crude become essential to supply the market. Optimizing the residuum conversion technology to yield a wide range of light and medium distillates is the toughest mission confronting refiners today and depends on the knowledge about the feedstock, products, physicochemical properties and catalysts tailoring.

Ebullated bed reactors are used in hydroconversion processes where a centrifugal ebullating pump, along with a constant flow of residue and hydrogen, provides a looping flow in the reactor that maintains rice-like catalyst in suspension. This constant flow mixes the catalyst with liquid and vapor. Fresh catalyst can be injected, and spent catalyst withdrawn, to control the reaction at any time.

Although this continuous operation is particularly efficient to process heavy-oil with high metal and sulphur content, it requires reliable valve designs that can withstand the demanding environment.

Velan's advanced valve technology—to isolate high-pressure catalyst and hydrogen

Velan joined the market, manufacturing metal-seated ball valve in 1986 with the launch of the product line in partnership with EVI, developing products for refining, chemicals, and pulp and paper including our first delayed coker project.

Since 1997, Velan has taken proven valve design features and incorporated them into several advanced valve technologies including to isolate high-pressure catalyst and hydrogen.

Our valves are designed with special material selection and purging configurations for high-pressure and temperature coking services, and technologically advanced coatings make our isolating design one of only two approved by all major licensors.

Velan has commissioned over 11,000 valves for ebullated bed projects around the world. Ask us about our complete solutions for the ebullated bed market including purge panels, digital monitoring, and more.



Map illustrates the number of ebullated bed and slurry residue hydrocracker facilities that have chosen Velan valves.

Velan: Over 35 years of metal-seated ball valve innovation

- 1986** Launch of metal-seated ball valve product line in partnership with EVI
First delayed coker project
- 1989** First ethylene cracking project
- 1994** First hydroconversion project
- 1997** Securamax acquisition expanded portfolio to severe service valves for mining and process industries
Velan introduced external roller bearing technology
- 2006** Installed Class 2500 valves with Securing gold-plated gasket for an ebullated bed project
Velan developed a double ball valve for ebullated bed units
- 2012** Velan joined MIC-CSE, the largest industrial research chair for coatings in Canada
- 2014** Velan delivered more than 400 metal-seated ball valves for a coal gasification project
- 2017** Launched the patent-protected pneumatic and hydraulic cable drive actuator
- 2018** Velan developed Hexa-Shield thermal sleeve technology
- 2020** Velan installed IIoT online valve monitoring solution
- 2021** Velan commissioned more than 500 valves for an ebullated bed project
Supplied purge panels for ebullated bed markets with valves

Typical Velan valves for ebullated bed and slurry-phase hydrocracking

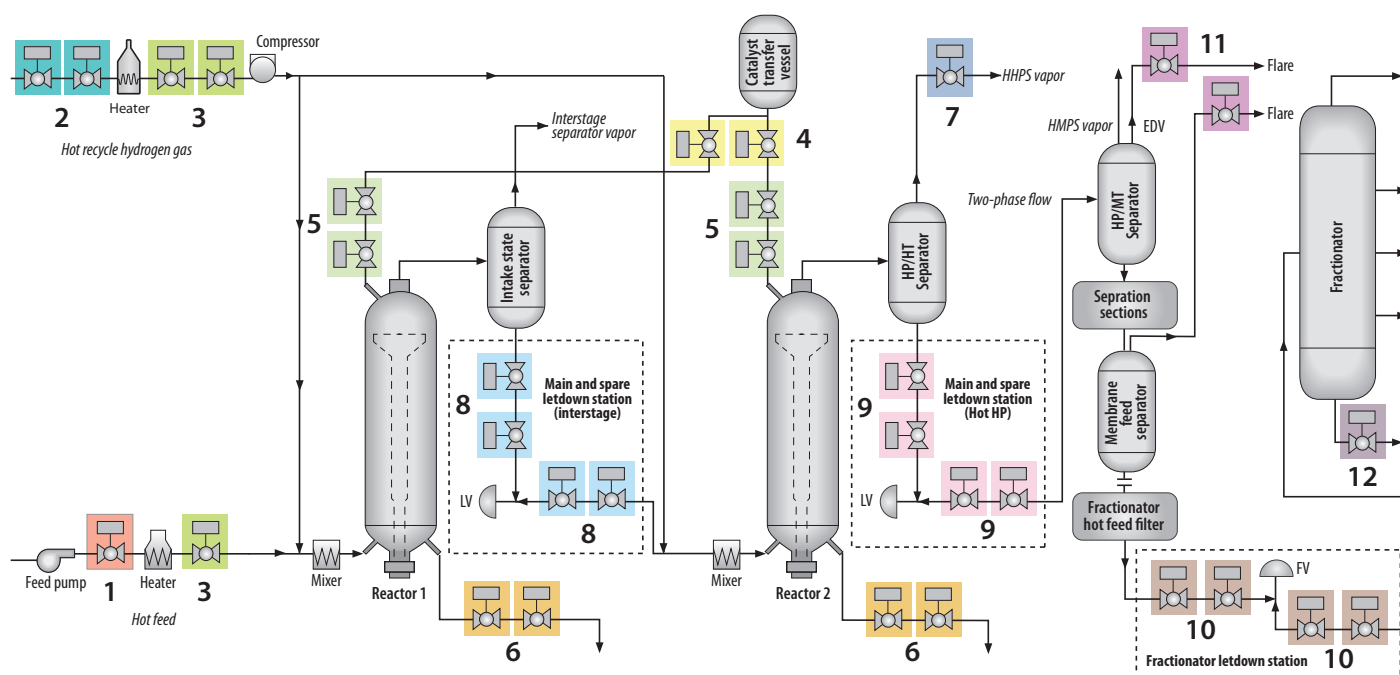


Velan R-series hub end



Velan Y-pattern stop check

Velan: Valve solutions for hydroprocessing



Schematic of a typical ebullated bed valve installation

	Process region	NPS (DN)	Valve type	Fluid conditions (metric)	Velan advantages
1	Hydrocarbon feed	16 (400)	R-series metal-seated ball	450–850°F at 2900–3400 psi (232–454°C at 200–234 bar)	All sealing surfaces are inherently protected from severe service in both open and closed positions.
2	Hydrogen heater inlet and outlet	16 (400)	Y-pattern stop check	400–850°F at 2900–3400 psi (204–454°C at 200–234 bar)	The design includes Low-E packing that is inherently fire safe.
3	Chopper	16 (400)	R-series metal-seated ball	450–850°F at 2900–3400 psi (232–454°C at 200–234 bar)	Fast-acting SIL-rated pneumatically actuated ball valve designed to securely shut flow in emergency situations.
4	Control (ball)	3 (80)	R-series metal-seated ball	800–1100°F at 2900– 3400 psi (427–593°C at 200–234 bar)	Severe service ball valves equipped with a tortuous path cage to precisely control the flow of catalyst.
5	Catalyst injection	3 (80)	R-series metal-seated ball	800–1100°F at 2900– 3400 psi (427–593°C at 200–234 bar)	• The double ball valve provides block and bleed while ensuring bi-directional sealing. • The thermal protection reduces thermal stress and increases resistance to fatigue.
6	Catalyst withdrawal/ coke laden catalyst	3 (80)	R-series metal-seated ball	800–1100°F at 2900–3400 psi (427–593°C at 200–234 bar)	
7	Gas/liquid stations hydrogen vapor	20 (500)	R-series metal-seated ball	800–900°F at 550–3200 psi (427–482°C at 38–221 bar)	Purging with hydrogen avoids residue and catalyst fine build-up.
8	High-pressure/high-temp. letdown isolation	16 (400)	R-series metal-seated ball	800–900°F at 3700 psi (427–482°C at 255 bar)	• Purging with VGO avoids residue and coke build-up. • The ASME section VIII bolted-joint avoids body seal leakage when purging. • The cobalt-based hardfacing offers sulphidation corrosion protection and controls the grain size and passivation of base materials.
9	Intermediate-pressure/ intermediate-temp. letdown	16 (400)	R-series metal-seated ball	800–900°F at 3700 psi (427–482°C at 255 bar)	
10	Low-pressure/low-temp. letdown	16 (400)	R-series metal-seated ball	800–900°F at 600 psi (427–482°C at 41 bar)	
11	Emergency depressuring	16 (400)	R-series metal-seated ball	800–900°F at 3700 psi (427–482°C at 255 bar)	Pneumatically actuated ball valve equipped with an air tank and SIL rating to ensure rapid depressurization in emergency situations.
12	Fractionator bottom	20 (500)	R-series metal-seated ball	800–900°F at 200 psi (427–482°C at 14 bar)	Steam purging avoids coke fouling.

Reference list available upon request.

Velan Securaseal® R-series: 12 unique design features

① Class 2500 valves in F321 and F347 stainless steel with Grayloc® clamp ends connectors

Stabilized heat-treated austenitic stainless steel Class 2500 valves are a must to control the flow of high-pressures and high-temperatures heavy residue containing sulfur and hydrogen.

② Securing gasket

The Securing gold-plated pressure-energized gasket mitigates sulfidation corrosion.

③ Hexa-Shield thermal sleeve

Velan has developed proprietary manufacturing techniques to design a replaceable thermal sleeve to minimize harmful heat conduction.

④ External roller bearing

An external roller bearing is standard for Class 2500, NPS 3 and above providing lower dynamic friction which will result in lower overall valve torque.

⑤ Bidirectional sealing

Superior spring-loaded seat configuration that ensures bidirectional sealing as per API598.

⑥ Coating solutions

Advanced thermal spraying coating technology to resist thermal shock, erosive catalyst and sulfidation corrosion.

⑦ Latest fugitive emissions (FE) qualifications

Our stem packing technology guarantees a low-emission stem seal over the life of the valve, reduces maintenance costs, and meets the highest industry standards.

⑧ Fire test qualifications

Full size range of valves meet the latest recent fire test standards, having qualified to API 607 and ISO 10497.

⑨ Purge system

Velan has developed specific purge systems that includes purge construction, specific flow rates and purge equipment to maintain adequate purging fluid within critical valves to mitigate coke formation.

Material selection for metal-seated ball valves

Valve part	Typical application		
	Fractionator bottom isolation	Steam isolation	Catalyst injection and withdrawal pressure letdown isolation
Body	WCB / A105	C12 / F9	F321/F347/CF8C
Ball	410 Cr. plated	410 + HVOF CrC	718 + S&F Cobalt-based
Seat	410 + CoCr alloy		
Stem	660	660	660

Velan imposes rigorous quality control on its carbon and austenitic materials to mitigate or avoid HIC and naphthenic and sulphidic induced corrosion. All materials meets the most recent NACE requirements.

Velan ensures optimized grain sizes and passivation of all machine surfaces to further ensure reliable performance in the most aggressive crude. Wear-resistant surface treatments are selected to **mitigate sulfidation corrosion**, including for highly sulphitic high temperature application.

⑩ Custom IIoT purge panel and sensors

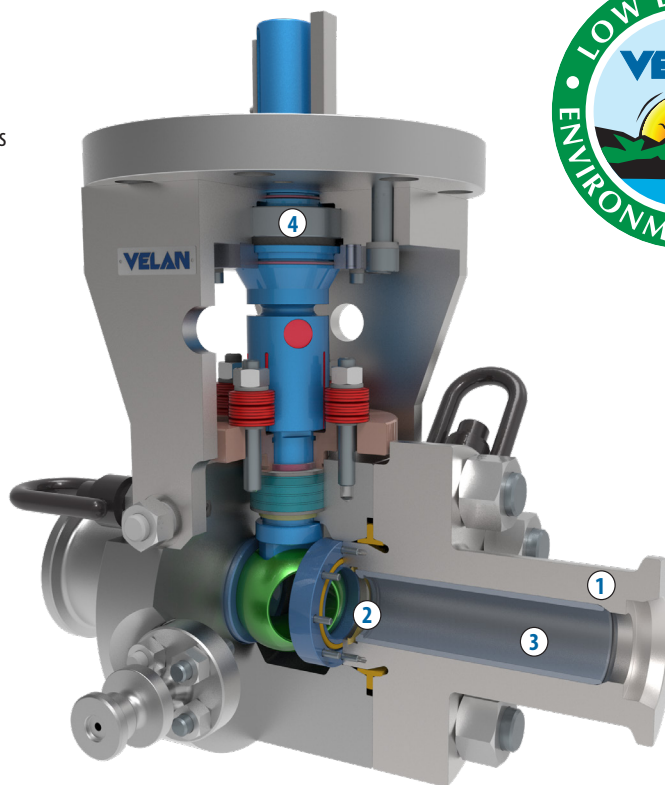
One web-enabled panel can collect, send and act on data acquired from their surrounding environments using embedded sensors, processors and communication hardware connected to multiple valves.

⑪ RFID tag technology

Radio frequency identification (RFID) tag technology enables digital identification and tracking of in-service valves using software to communicate and collect data.

⑫ Cable drive actuator

Velan's patent-protected cable drive actuator is the ideal choice in hydroprocessing with its linear characteristics, constant efficiency, zero backlash, and reduced lag.



Sizes	NPS ½ – 36 (DN 15 – 900)
Pressure rating	ASME Class 150, 300, 600, 900, 1500, 2500, and 4500

Velan Securaseal® R-series: 12 unique design features

① Class 2500 valves in F321 and F347 stainless steel with Grayloc® clamp ends connectors

For the ebullated bed application, metal-seated ball valves typically range from NPS 1–20 with pressure Classes 150–2500, and valves up to Class 600, sharing the same internals. These metal-seated ball valves meet ASME B16.34 and API 608 standards and are designed in compliance with strict specifications issued by the licensors. They are typically made from stabilized austenitic stainless steel such as SS 321 and SS 347 and include Grayloc® clamp ends connectors.

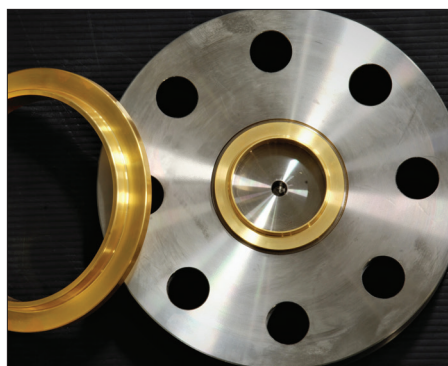


Grayloc® end connectors allow valves to be installed without regard to bolt hole alignment and can be assembled and disassembled in confined spaces with minimal clearance and are ideal for extreme service conditions. This connector features a metal-to-metal bore seal that is recognized as the standard for critical service piping and vessel connections. Grayloc® connectors save weight, space, and fabrication time.

Long after installation, ongoing advantages include lowered maintenance costs, reduced inventories, and increased performance.



Velan R&D testing the Hexa-Shield thermal sleeve.



② Securing gasket

As early as 1997 and first introduced on Velan's Securaseal product line, Velan has utilized metallic, pressure-energized gaskets to seal the bolted joint in a two-piece ball valve construction. The reliability of these Securing gaskets is proven continuously effective, especially for refiners that cannot afford unexpected shutdowns due to valve joint leaks and associated safety concerns with combustible leaking media.

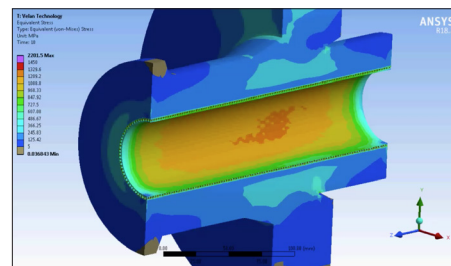
Throughout its maturation process, Velan engineers have added specialized coatings on the Securing gaskets. Molybdenum Sulphide (MoS) was first used. Later years, an upgraded coating of 99.99% pure gold plating replaced MoS. Even though the gold plating was more costly to produce, valve performance and 'seal' reliability was chosen over potential savings.

Today, all high-pressure ball valve configuration of Class 1500 and higher utilize the Securing gasket with gold plating as its standard. Securing gaskets are not only designated for HP applications, but can be configured for critical applications in severe (piping) vibrations or upgrades to valves with reoccurring body joint leaks.

③ Hexa-Shield thermal sleeve

Thermal shock damage can be found in catalyst injection and withdrawal valves and its connection pipes. Cracking of the valve body and seats has been observed when valves are exposed to temperatures and pressures up to 850° F and 3,500 psi at 1-5 cycles per day.

Such locations are areas of high Delta T and high resultant stresses. The higher the Delta T, the more likely, and sooner, thermal fatigue may occur.

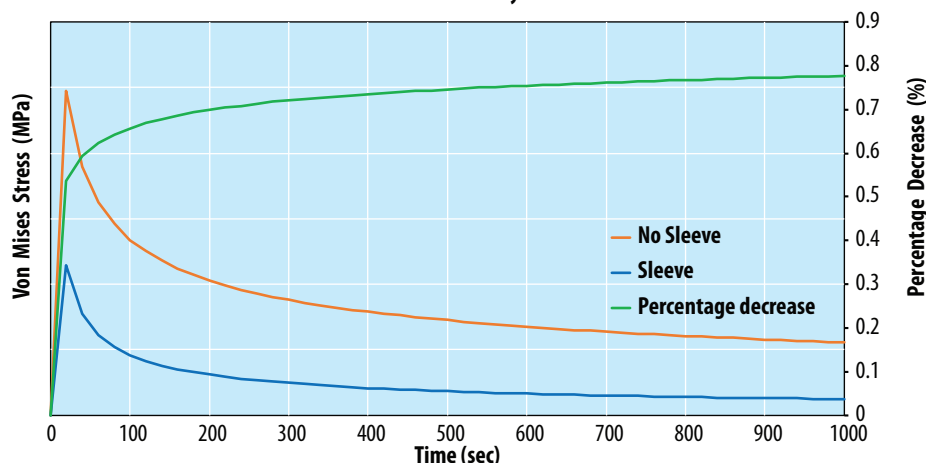


In 2018, the Hexa-Shield thermal sleeve was developed by Velan. Constructed of Inconel 718, a material compatible with the operating condition, the sleeve is provided with an internal pattern creating intrinsic thermal insulation. During its development, several finite element analyses have been conducted to assess the impact of the Hexa-Shield thermal sleeve (shown below).

Based on these analyses, the design life of the valve increased over 50,000 thermal cycles when exposed to typical operation conditions encountered in catalyst injection and withdrawal application.

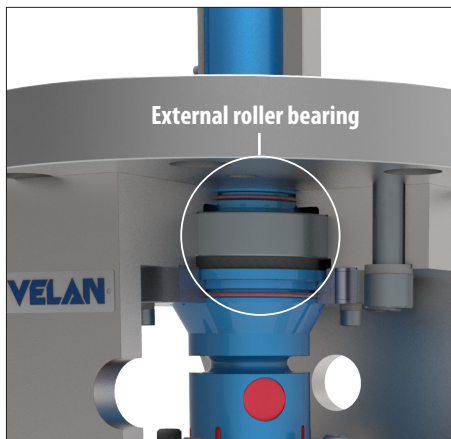
These results have been validated on a test bench at Velan R&D center where the Hexa-Shield thermal sleeve was exposed to thermal shock to demonstrate thermal stress reduction and strength of the sleeves.

Finite element analyses



The Hexa-Shield thermal sleeve provides 70 % average stress reduction.

Velan Securaseal® R-series: 12 unique design features



④ External roller bearing (ERB)

Velan employs a thrust bearing feature that is located outside of the valve body. With the thrust bearing feature located on the outside, instead of inside the valve body, media temperature and its corrosive properties will not influence its performance.

The thrust bearing also incorporates cylindrical 'rollers' to reduce the thrusting effects from pressure loading the stem. Thus, the full impact to the valve overall torque is reduced with the use of this external roller thrust bearing (ERB).

From detailed technical analysis, the ERB can decrease the valve overall operating torque by as much as 25%. This reduction in valve torque may decrease the actuator model by one configuration size, savings of costs, size, and weight, all are benefits passed on to customers.

In addition to the ERB, Velan has another stem bearing feature that is positioned at the traditional location, inside the valve body on top of the stem upset diameter. This internal bearing feature is a barrier against the media from propagating upwards into the stem packing area – protecting the stem packing rings against abrasive (fine catalysts) or other harmful elements.



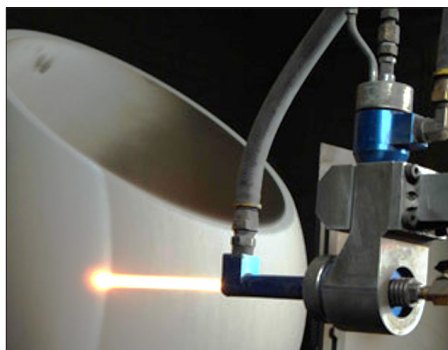
Actual roller bearing.

⑥ Coating solutions

Thermal spraying (TS) encompasses various methods in which a material powder is totally or partially melted in a high temperature gas flame and then sprayed through a nozzle onto the substrate.

HVOF coatings are mechanically bonded to the substrate. The average bond strength, between the coating and the substrate ranges from 55 MPa up to 82.7 MPa (8,000 psi up to 12,000 psi).

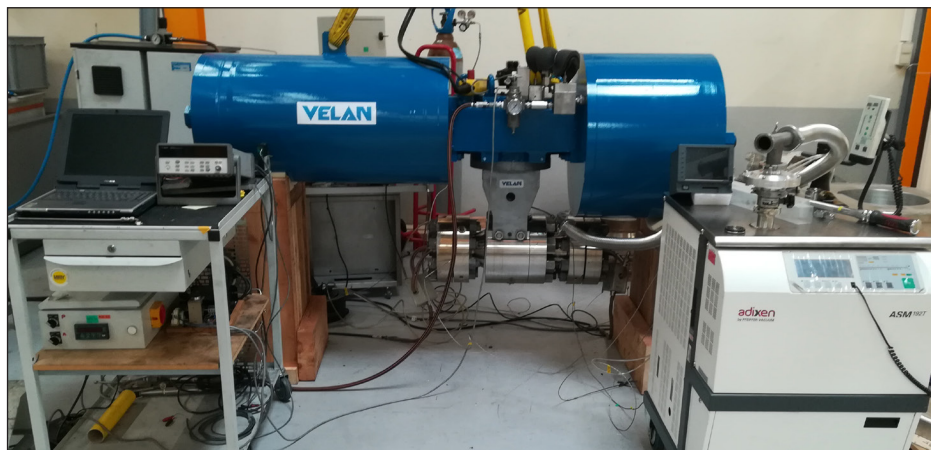
HVOF coating has been successful campaigns in mild ebullated bed applications at moderate temperature and pressure.



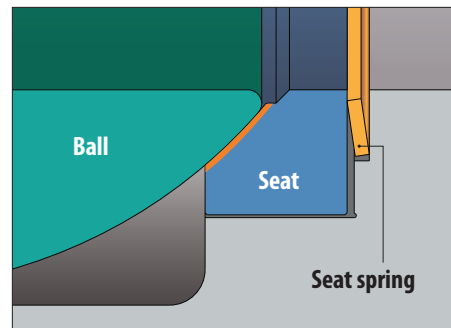
HVOF coating of a ball.

Spraying and fusing (S&F) is a variant of HVOF coatings in which a self-fluxing alloy is first deposited onto the surface using HVOF process. In a second step, the coating deposit is heated in a vacuum furnace with controlled heating and cooling parameters.

Due to its characteristics, the bond strength is significantly higher than HVOF, exceeding 482.6 MPa (70,000 psi). S&F coating has been successful campaigns in the most severe ebullated bed applications where thermal shock and high differential pressures are a concern.



Velan NPS 3 Class 2500 R-series metal-seated ball valve successfully passing ISO 15848-1 fugitive emissions testing.



⑤ Bidirectional sealing

A superior spring-loaded seat configuration ensures bidirectional sealing as per API 598. A Belleville type seat spring arrangement ensures necessary contact sealing/seating force for tight shut-off and smooth operation under all conditions.

Seat-leakage standards: Closure tests and leakage rates are performed in accordance with API 598 and FCI 70-2 Class VI. For valves that require by directional shut off performance the closure test is performed in both directions.

⑦ Latest fugitive emissions (FE) qualifications

Velan has both a vast prequalified commodity product range and provides project specific qualifications made to order to current industry Fugitive emissions standards. Velan's Securaseal R-series graphite packed metal-seated ball valves are qualified to API 641 (up to NPS 12, Class 1500) and can be purchased as per ISO-15848-1 up to NPS 20, Class 2500 and have packing qualified to API 622 fugitive emission requirements.

Fugitive emissions standards

- ISO-15848
- API 622
- API 624 & API 641
- TA-LUFT



Velan Securaseal® R-series: 12 unique design features

8 Fire test qualifications

Five Velan valves, including two Securaseal R-series MSBVs, were fire tested to the latest API and ISO standards. All five valves passed the fire test on their first attempt – achieving a 100% pass rate.

The two R-series valves, with a unidirectional MSBV seat design were tested on both preferred and non-preferred sides. Both valves passed the tests with the non-preferred side demonstrating performance that is normally achieved with preferred side seat designs.

Velan valves tested to the most current industry fire test standards, achieving qualifications:

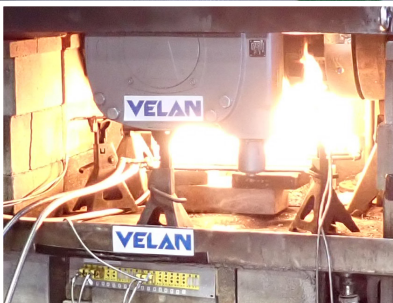
- API 607
- ISO 10497
- API 6FA
- API 589
- Tested on both Preferred and Non-preferred sides

Velan has both a vast prequalified commodity product range and provides project specific qualifications made to order. Securaseal R-series valves can be purchased with API and ISO fire test certification up to NPS 24, Class 2500.



Above: Five Velan valves, including two Securaseal R-series metal-seated ball valves, fire tested to the latest API and ISO standards.

Right: R-series NPS 8 Class 1500 valve being fire tested.

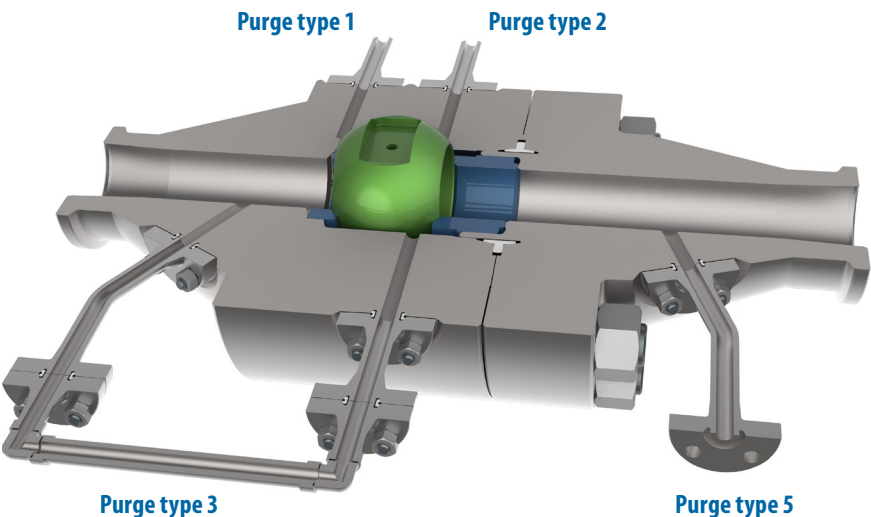


9 Purge systems

With over 30 years of experience in heavy oil upgrading with purging systems that keep critical areas free of coke build-up, Velan provides the optimal configuration, orifice selection, and in-service monitoring where required. Pressure letdown isolation valves are also exposed to catalyst fines (debris) formed in the ebullated bed reactor that are carried over into the let-down stations.

These pressure letdown block valves cycle between train A and B to perform maintenance on a critical piece of equipment. Considering the high-pressure and presence of hydrogen, they operate in tandem to provide reliable shut-off. They are subjected to sulfidation corrosion and residue build-up in the cavity due to low cycling.

Purge systems are recommended on valves with highest probability of coke formation, highest percentage of catalyst, and/or highest hydrocarbon slurry to increase valve performance and isolation tightness.



Purge type	Purge port location
1	On the spring side
2	Into the main body cavity
3	Exit from main body cavity and returning to upstream line
4	Purge port into main body cavity and feature to circulate purge fluid around spring seat. ⁽¹⁾
5	To end connection of valve (vacuum service only)

(1) Not shown in this view.

Velan Securaseal® R-series: 12 unique design features



10 Custom IoT purge panel and sensors

Velan has developed customized purge systems that include purge construction, specific flow rates, and equipment to maintain adequate purging fluid within the critical valves. These purge systems are highly customizable and can be fitted to suit end users needs.

One web-enabled panel can collect, send and act on data acquired from their surrounding environments using embedded sensors, processors and communication hardware connected to multiple valves.

11 RFID tag technology

Radio frequency identification (RFID) tag technology enables digital identification and tracking of in-service valves using software to communicate and collect data.



12 Cable drive actuator

Velan's patent-protected cable drive actuator is the ideal choice in hydroprocessing with its linear characteristics, constant efficiency, zero backlash, and reduced lag. The transmission system converts the cylinder's linear motion into a quarter-turn rotation by creating a constant transmission ratio and constant mechanical efficiency along every stroke resulting in 97% constant mechanical efficiency.

The cable drive actuator is suitable for heavy-duty cycles thanks to its simple design, with no sliding friction and fewer moving parts, which increases the system's reliability and greatly reduces the need for maintenance.

Automation capabilities

Velan offers a wide range of products to address each customer's application. Our valves can be equipped with electric, hydraulic, or pneumatic actuation.

We also offer pre-installed switches, positioners, sensors (thrust and torque), and signal conditioners. Other available accessories include integral control actuation and two-wire control, overrides, limit stops, and most standard accessories.

Actuation feature to cycle on demand

- Valves can be supplied for direct mounting with no additional bracket or coupling.
- Drive train sizes are taken into consideration when selecting material and temperature.
- Actuators are oversized to ensure reliable valve cycling.

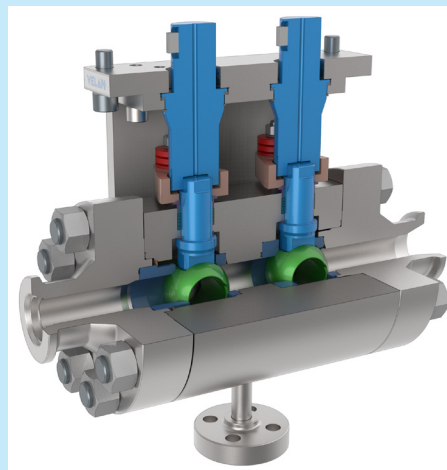
Securaseal R-series: for catalyst injection and withdrawal

Valves placed at the catalyst injection and withdrawal portion of the process enable the replacement of catalyst while the reactor is running. Typically, four catalyst lines are located at the bottom of the reactor to withdraw the catalyst, and four at the top to inject fresh catalyst. Each line has two ball valves before going to a manifold; one motorized and one manual. After the manifold, one motorized double ball valve ensures seal integrity of the injection manifold and the other ensures the integrity of the withdrawal manifold.

Catalyst injection and withdrawal valves are typically exposed to temperature swings from ambient up to 850°F (454°C) with 1–10 cycles per day. They require bi-directional sealing and are subject to thermal shock.

Double ball valves

To provide block and bleed and ensure bi-directional sealing, a double ball valve is typically designed with two ball valves integrated into one body. This specialty valve is provided with a dual operator that simultaneously opens and closes the two valves. The cavity in between the two balls can be either vented or pressurized when the valve is closed to ensure complete isolation of the catalyst manifolds.



The double ball valve provides block and bleed isolation.

Velan globe and stop check valves

Sizes	NPS 2½ – 24 (DN 65 – 600)
Pressure rating	ASME Class 900, 1500, and 2500

Velan's innovative pressure seal design provides greater sealing force that is increased through internal pressure. The y-pattern globe design offers low-pressure drop compared to vertical globe valves, excellent resistance to the effects of thermal cycling, low torque stroking, and easy in-line repair.

Design features

1 Body

Body is made with superior strength forgings or high quality castings. Valves are available in a wide range of materials.

2 Stem seal design

Evolved from extensive testing, offering a tight seal with little or no maintenance over long periods of time. The non-rotating stem requires lower operating torque.

Other available options are live-loaded packing to keep the stem tight and a stem expansion/contraction thrust unit for high temperature applications.

3 Disc and seats

Body guided disc eliminates side thrust and provides longer life to the disc, seat, and body. The disc is CoCr alloy hardfaced on seat contact and disc guiding surfaces, which provides maximum resistance to erosion and wear.

Additional features

Impactor handwheels

Available on sizes NPS 2½–4 (DN 65–100) offering 3–10 times more closing force than a standard handwheel resulting in smooth, easy operation and tight shutoff under extreme pressures.

Equalizing and bypass pipes and valves

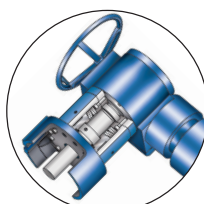
Offered in many different configurations to help ensure the valve will open under any operating conditions.

Bolted bonnet T-pattern valves in critical hydrogen lines

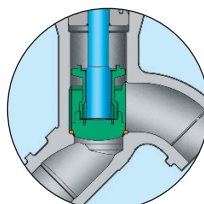
These valves are critical to isolate the high-pressure hydrogen line. They are prone to packing and gasket leakage during temperature swings leading to fire.

Low-E packing arrangement: Our fully qualified packing configuration includes live-loading and minimizes operational torque.

Optional

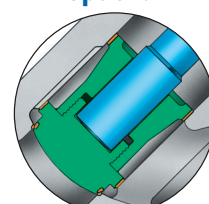


Thermal thrust box



Elbow down
(078P/forged or 078K/cast)

Optional



Stop check disc
(086P/forged or 086K/cast)

Material selection for pressure seal stainless steel y-pattern globe valves

Valve part	Typical application		
	Fractionator bottom isolation	Steam isolation	Hydrogen heater inlet/outlet pressure letdown isolation
Body	WCB / A105	C12A / F91	F347 / CF8C
Disc	WCB / A105 + CoCr alloy	C12A / F91 + CoCr alloy	347 + CoCr alloy
Seat	Integral + CoCr alloy	Integral + CoCr alloy	
Stem	XM-19 ⁽¹⁾	ASTM A565 Gr. 616HT	XM-19 ⁽¹⁾

(1) SS 630 or SS 660 are available upon request.



Research & Development



Customers get a first hand look at Velan's R & D facilities in Montreal, Canada.

Velan's Research & Development (R&D) group is a key part of the Velan engineering team, and the services they provide include technical project management, design and analysis, standard and customized experimentation work, performance evaluation, and turn-key support from project initiation to program completion.

Velan's R&D provides customized testing programs, working closely with specialized third-party labs, to help develop and qualify our valves to client's specifications and qualification needs.

Velan's severe service valves are custom designed to handle applications that can't be adequately handled using established materials and commercial valve designs. As a result, severe service valves require significant R&D to address the specific performance requirements for processes in which a valve undergoes harsh conditions such as high speed actuation, high temperature, acid leach, slurry, and more.

Velan R&D services

- Project management
- Design and analysis
- Experimental prototyping and lab simulation
- Performance evaluation
- Product release or launch

Field Engineering Services (FES) & Aftermarket support

Velan offers our end-users technical support and in-line service and maintenance on all our valve products. We are your one-stop-shop for repairs backed by Velan quality and warranty.

Our team of service engineers and technicians are available 24 hours a day. We are equipped with the most sophisticated tools available and over 50 years of valve service experience in nuclear and thermal power stations, fossil fuel plants, naval fleets, petrochemical, chemical and mining applications. We offer complete support leading up to and throughout your maintenance outages and turnarounds. All our work carries the Velan quality our customers have learned to trust and is backed by our warranty.

Velan has a network of authorized service shops across the globe, ensuring we can meet your maintenance and service requirements wherever your location. Service providers are qualified with Levels I, II, III and IV shop classification, with Level I shops being the highest qualified. Velan's authorized valve service and repair shops and are your best choice for servicing your Velan valves.



On-site service for Velan valves.



To find a service shop in your area, visit our website: velan.com/en/services/service-locations.

Velan FES & Aftermarket services

- On-site service, maintenance, and product support on all Velan valve products.
- Engineering support, and unsurpassed know-how.
- Velan OEM spare parts are specific to Velan's design and testing.



Securaseal R-series metal-seated ball valve data sheet

For more comprehensive information about the R-series valve go to velan.com to download Velan's data sheet for Securaseal R-series valves. Document code: DS-MSBVR found [at this link](#).

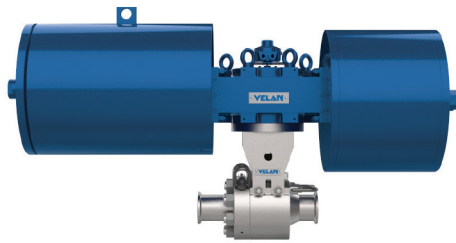
You can also find a complete library of Velan maintenance manuals and product literature.

You must be signed into your **My Velan** account to access these documents.

Part of Velan's leading portfolio of valves for severe service applications



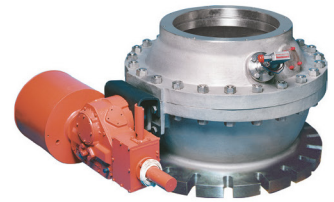
Delayed coking



Ebullated bed



Mining



Other severe services

Learn more about Velan's full product line at [velan.com](https://www.velan.com)

Quarter-turn

- Memoryseal® ball valves
- Securaseal® metal-seated ball valves
- Torqseal® triple offset valves
- Velflex high performance cryogenic butterfly valves
- Coker ball valves
- Velan ABV API 6A & 6D trunnion-mounted ball valves

Check our website for more resources

Go to the *Resources* tab on [velan.com](https://www.velan.com) for our most up-to-date library of literature and tools. Select "**Join My Velan**" to gain access.

As a member of the **MyVelan** community, you can access resources including Maintenance manuals (IOMs), Product updates, Data and Quick sheets, Application notes, and more.

Gate, globe, and check

- API 600 gate, globe and check valves
- API 603 corrosion resistant gate, globe and check valves
- Pressure seal high-pressure gate, globe and check valves
- API 602 small forged gate, globe and check valves
- Proquip dual plate check valves
- Y-pattern bonnetless globe and check valves
- Velan ABV expanding and slab gate valves

Special applications

- Nuclear
- Cryogenic
- HF Alkylation



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[velan.com](https://www.velan.com)

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