

# Hydrofluoric acid alkylation valves

Gate, globe, and check



**API 602 Forged steel**  
**NPS ½–2 (DN 15–50)**



**API 600 Cast steel**  
**NPS 2–36 (DN 50–900)**

**VELAN**

# VELAN'S PROFILE

## VELAN AT A GLANCE

### History

- Founded in 1950

### People

- Over 2,000 employees

### Product line

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

- Cast steel gate, globe, check, and ball valves
- Forged steel gate, globe, check, and ball valves
- Triple-offset butterfly valves
- Knife gate valves
- Severe service valves
- Bellows seal valves
- Steam traps

### Primary industries served

- Fossil, nuclear, and cogeneration power
- Oil and gas
- Refining and petrochemicals
- Chemicals and pharmaceutical
- LNG and cryogenics
- Marine
- HVAC
- Mining
- Water and wastewater
- Pulp and paper
- Subsea

### Velan holds major applicable approvals:

- ASME Section III N and NPT for nuclear valves (since 1970)
- ISO 9001 (since 1991) and ISO 14001
- OHSAS 18001
- PED
- SIL
- GOST
- API 6A and API 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, Newport News Shipbuilding, and DCMA.
- Total Process Improvement Program, including Lean Manufacturing and Six Sigma



Velan is one of the world's leading manufacturers of cast and forged steel gate, globe, check, ball, triple-offset, knife gate, highly engineered severe service valves, and steam traps offering superior performance across all major industrial applications including: fossil, nuclear, and cogeneration power; oil and gas; refining and petrochemicals; chemicals and pharmaceutical; LNG and cryogenics; marine; HVAC; mining; water and wastewater; pulp and paper; and subsea. The company also supplies actuators and integrated control packages.

## TABLE OF CONTENTS

Velan's global network ..... 3

API 602, HF acid compact forged steel gate, globe, and check valves, including piston, swing, and ball type valves - UOP and Phillips

NPS ½–2 (DN 15–50), Pressure classes 150 – 800 ..... 4–5

HF acid carbon steel and monel gate, globe, and check valves - UOP and Phillips

NPS 2–36 (DN 50–900), Pressure classes 150 – 600 ..... 6–7

Founded in 1950, Velan has earned a reputation for product excellence and innovation by bringing to the market superior products with special emphasis on quality, safety, ease of operation, and long service life. Velan valves have an extremely broad installation base and are approved by major companies worldwide.

## TESTING

### HIGH PRESSURE HELIUM GAS TEST

In addition to API-598 testing, each cast valve is subjected to a high pressure Helium gas test as a check of the valve integrity. Each valve is pressurized to 450 psig with Helium at ambient temperature and held for 5 minutes. A leak detector with sensitivity to detect 2 ppm of Helium is then used to sniff all the valve including body/bonnet castings, packing and gasket.

### TA-LUFT CERTIFIED

Velan HF acid valves are TA Luft certified, meeting the stringent German Clean Air Requirements relating to air pollution control.





# VELAN'S GLOBAL NETWORK

## Head office



Montreal, Canada  
Velan Inc.

- 14 production facilities
  - 4 plants in North America
  - 5 plants in Europe
  - 5 plants in Asia
- 4 stocking and distribution centers
- Hundreds of distributors worldwide
- Over 60 service shops worldwide

## Manufacturing plants

### North America



Montreal, Canada  
Velan Inc., Plant 1



Montreal, Canada  
Velan Inc., Plant 2 and 7



Granby, Canada  
Velan Inc., Plant 4 and 6



Williston, VT, U.S.A.  
Velan Valve Corp., Plant 3



### Europe



Lyon, France  
Velan S.A.S.



Mennecy, France  
Segault S.A.



Lisbon, Portugal  
Velan Válvulas Industriais, Lda.



Lucca, Italy  
Velan ABV S.r.l., Plant 1



Lucca, Italy  
Velan ABV S.r.l., Plant 2

### Asia



Ansan City, South Korea  
Velan Ltd., Plant 1



Ansan City, South Korea  
Velan Ltd., Plant 2



Taichung, Taiwan  
Velan Valvac Mfg. Co., Ltd.



Suzhou, China  
Velan Valve (Suzhou) Co., Ltd.



Coimbatore, India  
Velan Valves India Pvt. Ltd.

## Distribution centers



Granby, Canada  
VelCAN




Benicia, CA, U.S.A.  
VelCAL




Missouri City, TX, U.S.A.  
VelTEX



Willich, Germany  
Velan GmbH

 – ASME N-stamp accredited manufacturer

 – Manufacturing plants for hydrofluoric acid service

# HYDROFLUORIC ACID ALKYLATION VALVES

## API 602 HF ACID COMPACT FORGED STEEL GATE, GLOBE, AND CHECK VALVES, INCLUDING PISTON, SWING, AND BALL TYPES – UOP AND PHILLIPS

NPS ½–2 (DN 15–50), PRESSURE CLASSES 150 – 800

**Body** – ASTM B564, UNS N04400 annealed Monel or ASTM A105 carbon steel with supplementary requirements to A961 S62, designed in accordance to API 602.

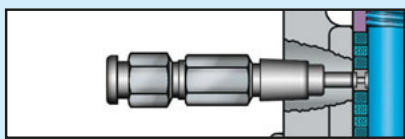
**Rising stem** – makes for easy visibility for open-close indications.

**Stem made from hardened Monel K500** for strength and durability.

### OPTIONAL:

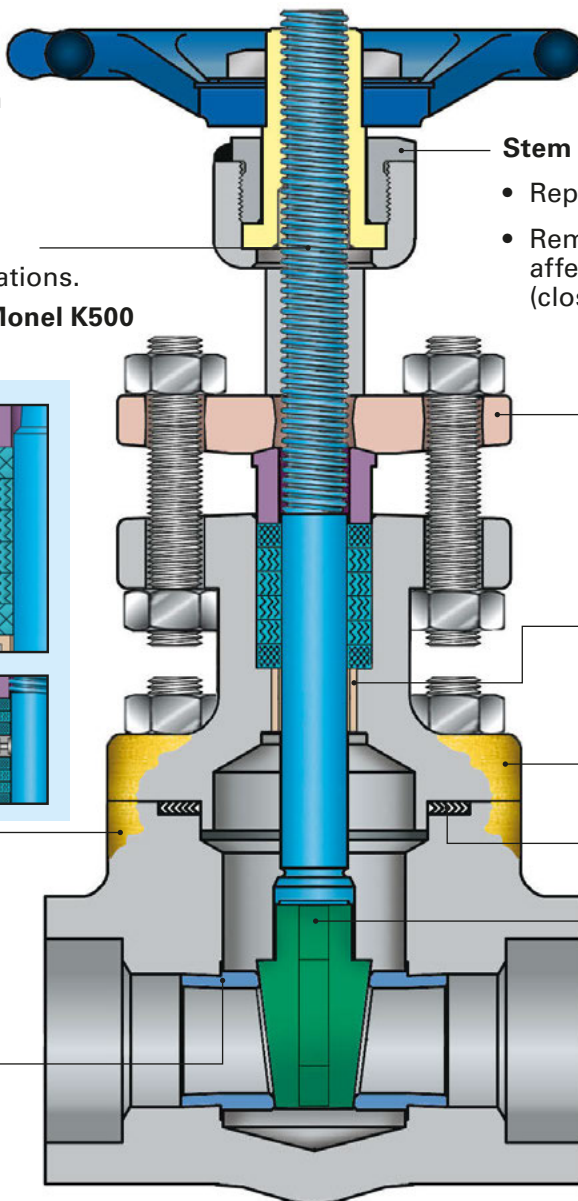
**Nickel-lined stuffing box and stem hole.**

**Grease injector and lantern ring<sup>(1)</sup>** where grease injection is a requirement.



**HF acid detecting paint** to ensure valve sealing integrity.

**Seat rings** – made of solid Monel 4400.



**Stem drive** – two-piece allows for:

- Replacement of yoke bushing in-line.
- Removal of handwheel without affecting position of valves (closed or opened).

**Gland** – two piece gland bushing/packing flange is self-aligning to prevent stem damage for cocked gland.

**Nickel plated overlay in stem hole for carbon steel valves** to combat severe alkylation conditions.

**Bonnet** – large extended type bonnet grade.

**Bonnet joint** encapsulated gasket design.

**Wedge** – solid Monel ASTM A494 M35-1 or NO4400

### END CONNECTIONS:

- Flanged
- Socket weld<sup>(1)</sup>
- Threaded<sup>(2)</sup>

(1) Available for UOP only.

(2) Available for Phillips only.

### STANDARD TRIMS FOR HF SERVICE

<b>Stem</b>	Monel K 500
<b>Wedge and disc</b>	Monel or Monel with Teflon insert
<b>Seats</b>	Monel
<b>Gasket</b>	Monel and Graphite
<b>Packing</b>	Graphite for low emission
<b>Body/bonnet studs</b>	A 193-B7M
<b>Body/bonnet nuts</b>	A 194-2HM
<b>Paint</b>	Acid detecting paint: Ameron "On-Guard"

# HYDROFLUORIC ACID ALKYLATION VALVES

## VELAN API 602 HF ACID COMPACT FORGED STEEL VALVES (PHILLIPS)

Type	Size		End connection	Class	Material <sup>(1)</sup>	Design features <sup>(2)</sup>			Model number
	NPS	DN				PTFE	NSB	NSH	
Gate	½ – 1	15 – 25	Threaded	800	Monel				___S-2054B-19HM-P1
	½ – 1	15 – 25	Threaded	800	A-105			✓	___S-2054B-02HM-P1
	½ – 1	15 – 25	Threaded	800	A-105		✓		___S-2054B-02HM-P2
	2	50	Flanged	300	Monel				___F-1054B-19HM-P1
	2	50	Flanged	300	A-105			✓	___F-1054B-02HM-P1
	2	50	Flanged	300	A-105		✓		___F-1054B-02HM-P2
Globe	¾	20	Threaded	800	Monel	✓			___S-2074B-19HM-P3
	½ – 1	15 – 25	Threaded	800	Monel				___S-2074B-19HM-P1
	¾ – 1	20 – 25	Threaded	800	A-105	✓		✓	___S-2074B-02HM-P3
	2	50	Flanged	300	Monel				___F-1074B-19HM-P1
	1½ – 2	40 – 50	Flanged	300	A-105			✓	___F-1074B-02HM-P1
	2	50	Flanged	300	A-105		✓		___F-1074B-02HM-P2
Check	½ – 1	15 – 25	Threaded	800	Monel	Swing			___S-2114B-19HM-P1
	½ – 1	15 – 25	Threaded	800	Monel	Piston			___S-2034B-19HM-P1
	½ – 1	15 – 25	Threaded	800	Monel	Ball			___S-2024B-19HM-P1

## VELAN API 602 HF ACID COMPACT FORGED STEEL VALVES (UOP)

Type	Size		End connection	Class	Material <sup>(1)</sup>	Design features <sup>(2)</sup>					Model number	Pipe class
	NPS	DN				PTFE	NSB	NSH	SI	SS		
Gate	½–1	15–25	Socket weld	800	A-105	✓		✓	✓		___W-2054B-02HM-U6	HF-2, HF-20 "T"
	½–1½	15–40	Socket weld	800	A-105			✓			___W-2054B-02HM-U1	HF-4, HF-40 & HF-5, HF-50 "M"
	1½–2	40–50	Flanged	300	Monel				✓		___F-1054B-19HM-U4	HF-1 "B"
	½–1	15–25	Flanged	600	Monel				✓		___F-2054B-19HM-U4	HF-1 "B"
	½–2	15–50	Flanged	600	A-105	✓		✓	✓		___F-2054B-02HM-U6	HF-2, HF-20 "T"
Globe	½–1	15–25	Socket weld	800	A-105			✓	✓	✓	___W-2074B-02HM-U5	HF-2, HF-20 "A"
	½–1	15–25	Socket weld	800	A-105	✓		✓	✓		___W-2074B-02HM-U6	HF-2, HF-20 "T"
	½–1½	15–40	Socket weld	800	A-105			✓			___W-2074B-02HM-U1	HF-4, HF-40 & HF-5, HF50 "M"
	½–2	15–50	Flanged	300	A-105	✓		✓	✓		___F-1074B-02HM-U6	HF-2, HF-20 "T"
	1½–2	40–50	Flanged	300	Monel				✓	✓	___F-1074B-19HM-U5	HF-1 "B"
	½–1	15–25	Flanged	600	Monel				✓	✓	___F-2074B-19HM-U5	HF-1 "B"
	½–1½	15–40	Flanged	600	A-105			✓	✓	✓	___F-2074B-02HM-U5	HF-2, HF-20 "A"
Check	½–1	15–25	Flanged	600	Monel	Piston					___F-2034B-19HM-U1	HF-1
	½–1	15–25	Socket weld	800	A-105	Piston					___W-2034B-02HM-U1	HF-2, HF-20 & HF-4, HF-40 "M"
	½–1	15–25	Socket weld	800	A-105	Ball					___W-2024B-02HM-U1	HF-2, HF-20 & HF-4, HF-40 "M"

## DESIGN FEATURES

<b>PTFE</b>	PTFE seat insert
<b>NSB</b>	Nickel-lined stuffing box and stem hole option
<b>NSH</b>	Nickel-lined stem hole
<b>SI</b>	Stem grease injector installed
<b>SS</b>	Seat grease injector installed

(1) Body and bonnet trim material is always Monel.

(2) See table to the left for design feature designations.

In addition to UOP and Phillips valve designs, Velan offers **"Q" series HF valves** based on variations in sizes, pressure classes, end connections, material grades, and other unique features.



# HYDROFLUORIC ACID ALKYLATION VALVES

## HF ACID CARBON STEEL AND MONEL GATE, GLOBE, AND CHECK VALVES – UOP AND PHILLIPS

NPS 2–36 (DN 50–900), PRESSURE CLASSES 150 – 600

**Body and Bonnet** – casting to ASTM A216 Grade WCB cast carbon steel, with supplementary requirements to A216 S16, or ASTM A494 Grade M35-1 cast Monel with maximum carbon content to 0.20%.

Castings are 100% RT quality per B16.34 acceptance standards.

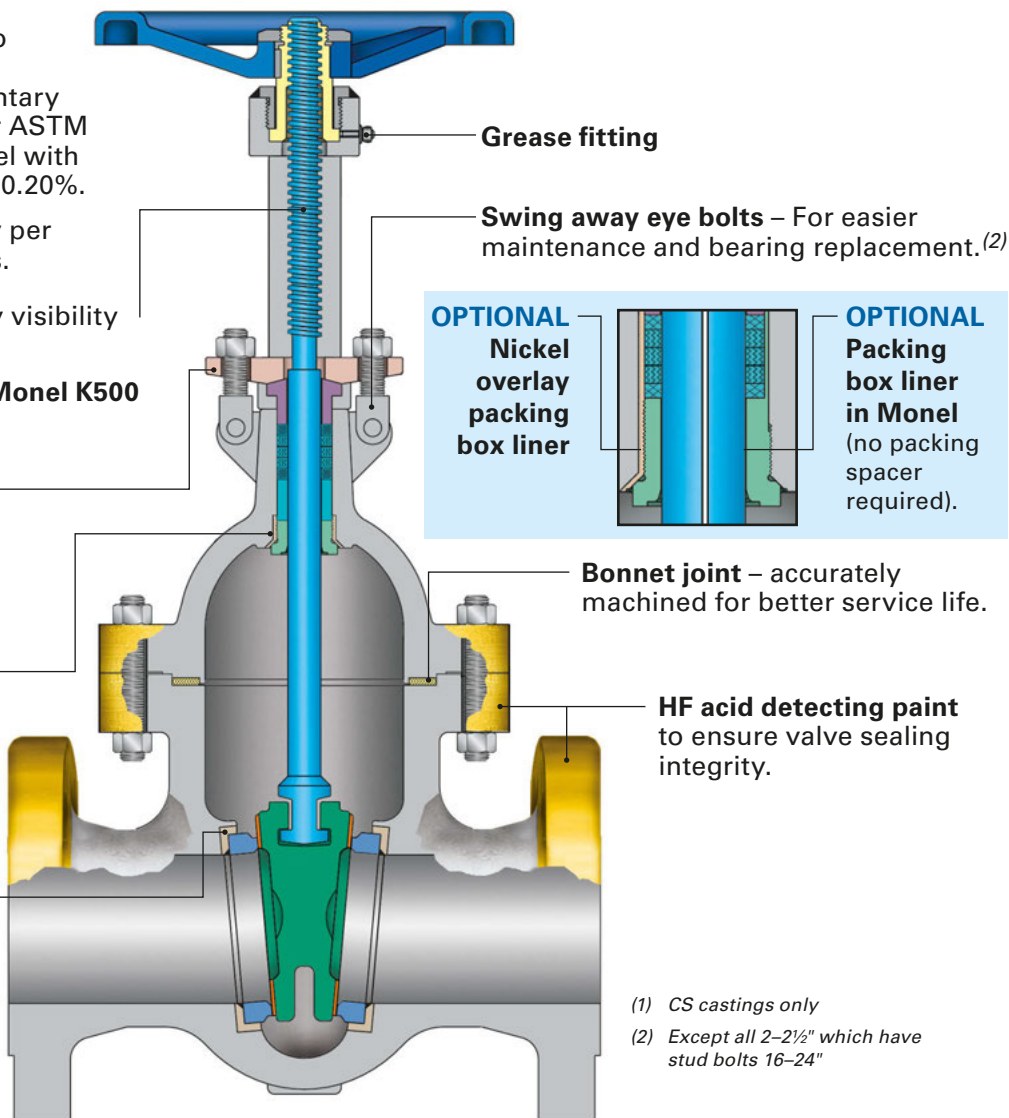
**Rising stem** – makes for easy visibility for open-close indications.

**Stem made from hardened Monel K500** for strength and durability.

**Gland** – two-piece gland bushing/packing flange is self-aligning to prevent stem damage for cocked gland.

**Nickel plated overlay on backseat in stem hole** to combat severe alkylation conditions.<sup>(1)</sup>

**Nickel overlay of the seat area** for strength and corrosion resistance.<sup>(1)</sup>

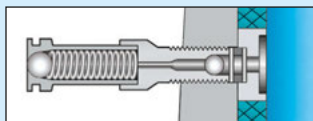


(1) CS castings only

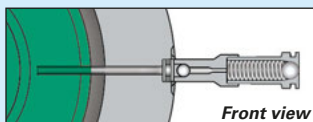
(2) Except all 2–2½" which have stud bolts 16–24"

### UOP OPTIONAL DESIGN FEATURES

**Grease injector and lantern ring:** where grease injection is a requirement.



**PTFE seat seal grease injection:** (when required)



**PTFE seat insert:** resists abrasion and corrosion.



### STANDARD TRIMS FOR HF SERVICE

<b>Stem</b>	Monel K 500
<b>Wedge and disc</b>	Monel M35-1 (UNS24135)
<b>Seats</b>	Monel or Monel with Teflon insert (UNS04400)
<b>Gasket</b>	Monel and Graphite
<b>Packing</b>	Graphite for low emission <sup>(3)</sup>
<b>Body/bonnet studs</b>	A 193-B7M
<b>Body/bonnet nuts</b>	A 194-2HM
<b>Paint</b>	Acid detecting paint: Ameron "On-Guard" <sup>(4)</sup>

(3) TA-Luft valve type approval shall be provided

(4) Acid detecting paint over standard primer and aluminum top coat.

# HYDROFLUORIC ACID ALKYLATION VALVES

## VELAN CARBON STEEL AND MONEL HF-ACID VALVES (PHILLIPS)

Type	Size		End connection	Class	Material <sup>(1)</sup>	Design features <sup>(2)</sup>			Model number
	NPS	DN				PTFE	MSB	NSH	
Gate	2-36	50-900	Flanged	300	A216 WCB			✓	__F-1064C-02HM-P1
	2-36	50-900	Flanged	300	A216 WCB		✓		__F-1064C-02HM-P2
	2-36	50-900	Flanged	300	Monel				__F-1064C-19HM-P1
Globe	2-12	50-300	Flanged	300	A216 WCB			✓	__F-1074C-02HM-P1
	2-12	50-300	Flanged	300	A216 WCB		✓		__F-1074C-02HM-P2
	2-12	50-300	Flanged	300	Monel				__F-1074C-19HM-P1
Check	2-30	50-750	Flanged	300	A216 WCB	Swing			__F-1114C-02HM-P1
	2-30	50-750	Flanged	300	Monel	Swing			__F-1114C-19HM-P1

## VELAN CARBON STEEL AND MONEL HF-ACID VALVES (UOP)

Type	Size		End connection	Class	Material <sup>(1)</sup>	Design features <sup>(2)</sup>						Model number	Pipe class <sup>(3)</sup>
	NPS	DN				PTFE	NSB	NSH	MSB	SI	SS		
Gate	2-36	50-900	Flanged	150	A216 WCB			✓				__F-0064C-02HM-U1	HF-4, HF-40 "M" (up to NPS 24)
	2-36	50-900	Flanged	150	A216 WCB				✓			__F-0064C-02HM-U2	
	2-36	50-900	Flanged	300	A216 WCB			✓				__F-1064C-02HM-U1	HF-5, HF-50 "M" (up to NPS 24)
	2-36	50-900	Flanged	300	A216 WCB				✓			__F-1064C-02HM-U2	
	2-36	50-900	Flanged	300	A216 WCB	✓		✓		✓		__F-1064C-02HM-U6	HF-2, HF-20 "T" (up to NPS 24)
	2-36	50-900	Flanged	300	Monel					✓		__F-1064C-19HM-U5 <sup>(4)</sup>	HF-1 "B" (up to NPS 8)
	2-36	50-900	Flanged	300	A216 WCB	✓	✓			✓		__F-1064C-02HM-U9	
Globe	2-12	50-300	Flanged	150	A216 WCB			✓				__F-0074C-02HM-U1	HF-4, HF-40 "M" (up to NPS 6)
	2-12	50-300	Flanged	150	A216 WCB				✓			__F-0074C-02HM-U2	
	2-12	50-300	Flanged	300	Monel					✓		__F-1074C-19HM-U5 <sup>(4)</sup>	HF-1 "B" (up to NPS 8)
	2-12	50-300	Flanged	300	A216 WCB	✓		✓		✓		__F-1074C-02HM-U6	HF-2, HF-20 "T" (up to NPS 10)
	2-12	50-300	Flanged	300	A216 WCB			✓				__F-1074C-02HM-U1	HF-5, HF-50 "M" (up to NPS 6)
	2-12	50-300	Flanged	300	A216 WCB				✓			__F-1074C-02HM-U2	
	2-12	50-300	Flanged	300	A216 WCB			✓		✓	✓	__F-1074C-02HM-U5	HF-2, HF-20 "A" (up to NPS 8)
	2-12	50-300	Flanged	300	A216 WCB	✓	✓			✓	✓	__F-1074C-02HM-U8	
	2-12	50-300	Flanged	300	A216 WCB	✓	✓			✓		__F-1074C-02HM-U9	
Check	2-30	50-750	Flanged	150	A216 WCB	Swing						__F-0114C-02HM-U1	HF-4, HF-40 "M" (up to NPS 16)
	2-30	50-750	Flanged	300	A216 WCB	Swing						__F-1114C-02HM-U1	HF-2, HF-20 (up to NPS 24) HF-5, HF-50 (up to NPS 16)
	2-30	50-750	Flanged	300	Monel	Swing						__F-1114C-19HM-U1 <sup>(4)</sup>	HF-1 (up to NPS 10)

## DESIGN FEATURES

<b>PTFE</b>	PTFE seat insert
<b>NSB</b>	Nickel-lined stuffing box and stem hole option
<b>NSH</b>	Nickel-lined stem hole
<b>MSB</b>	Monel-lined stuffing box option
<b>SI</b>	Stem grease injector installed
<b>SS</b>	Seat grease injector installed

(1) Body and bonnet trim material is always Monel.

(2) See table to the left for design feature designations.

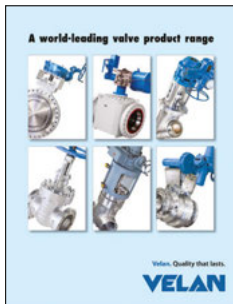
(3) Where UOP pipe class is not referenced, Velan offers value added features designed for customer specific applications.

(4) Seats are machined as an integral part of the body.

In addition to UOP and Phillips valve designs, Velan offers **"Q" series HF valves** based on variations in sizes, pressure classes, end connections, material grades, and other unique features.

*The most comprehensive line of industrial forged and cast steel gate, globe, check, ball, butterfly, and knife gate valves and steam traps.*

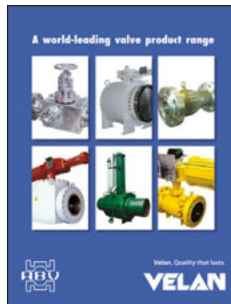
**ASME pressure classes 150–4500 in carbon, alloy, and stainless steel**



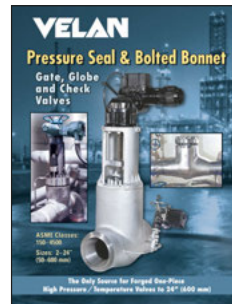
**BRO-FLB**



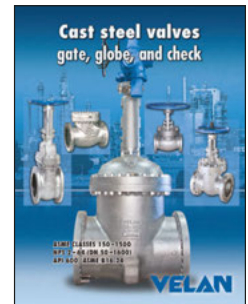
**SAS-FLB**



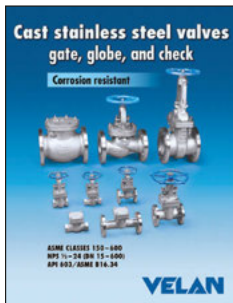
**ABV-FLB**



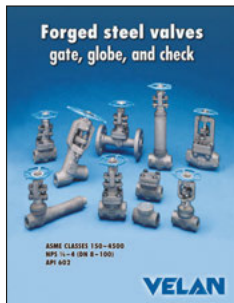
**VEL-PS**



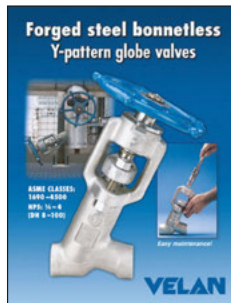
**CAT-CSV**



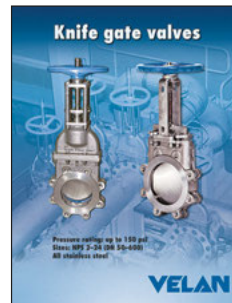
**CAT-CSSV**



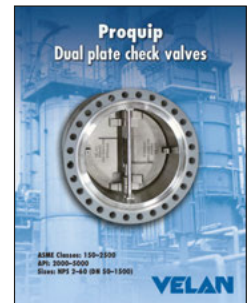
**CAT-SFV**



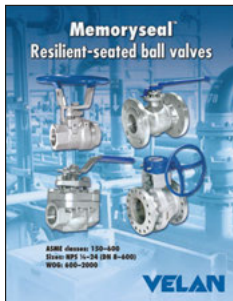
**CAT-BG**



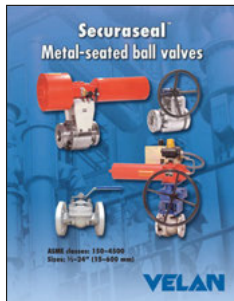
**CAT-KGV**



**CAT-DPCV**



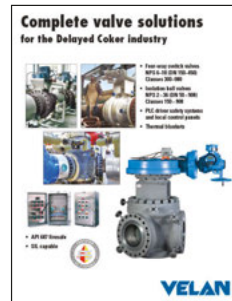
**CAT-BV**



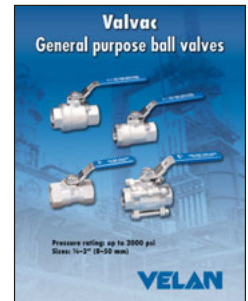
**VEL-MS**



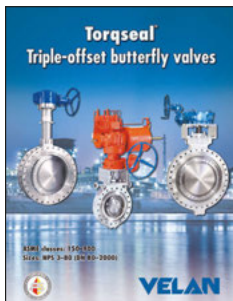
**CAT-PBV**



**BRO-CBV**



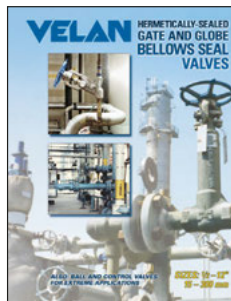
**CAT-GPBV**



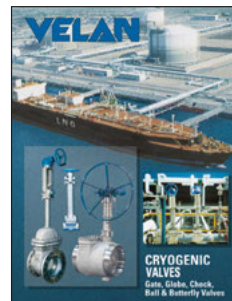
**CAT-BF**



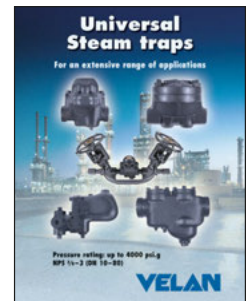
**SAS-CCV**



**VEL-BS**



**VEL-CRYO**



**CAT-ST**

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