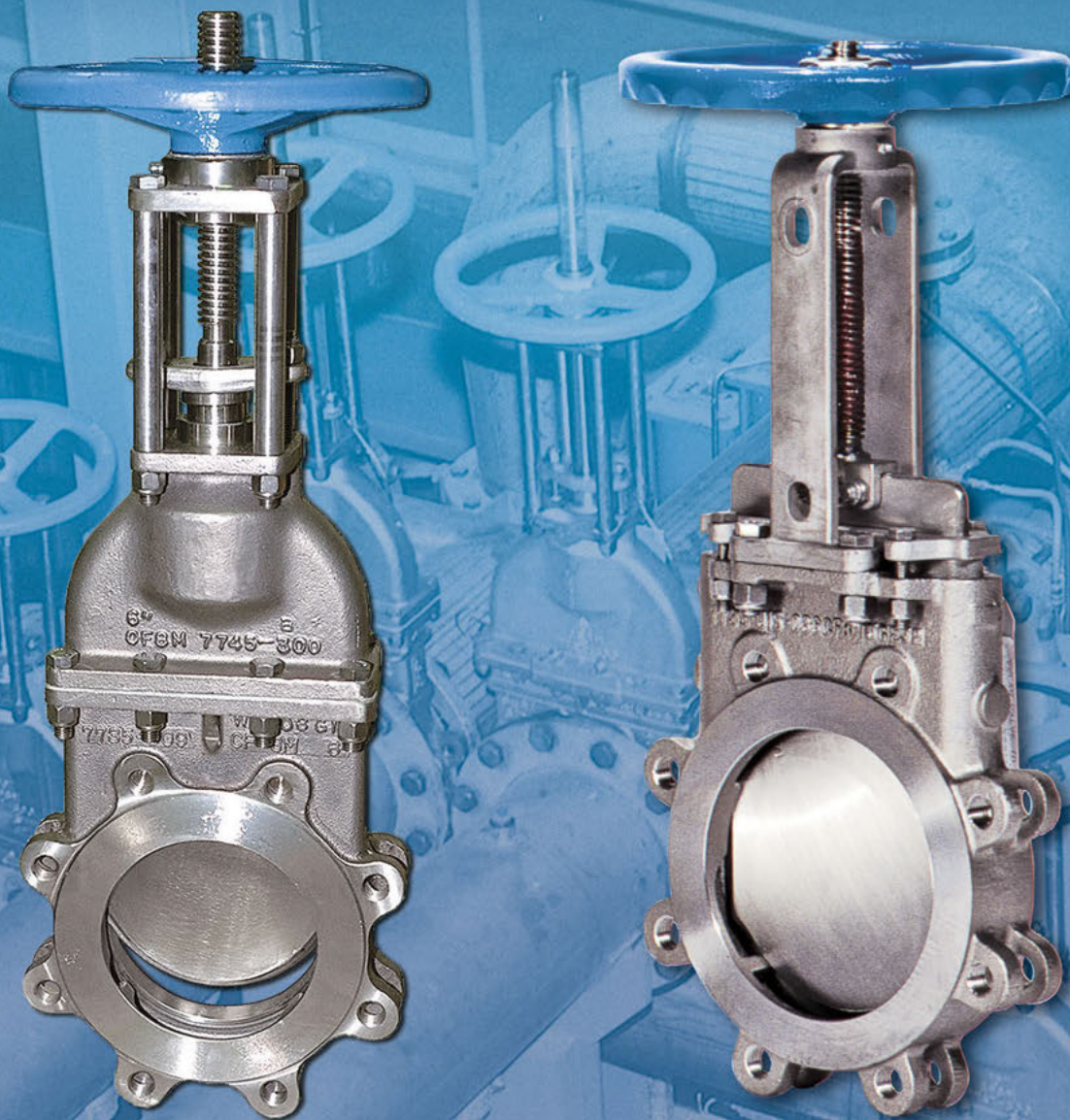


Knife gate valves



Pressure rating: up to 150 psi
Sizes: NPS 2-24 (DN 50-600)
All stainless steel

VELAN

VELAN'S PROFILE

VELAN AT A GLANCE

History

- Founded in 1950

People

- Over 1,900 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, API 624, 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.

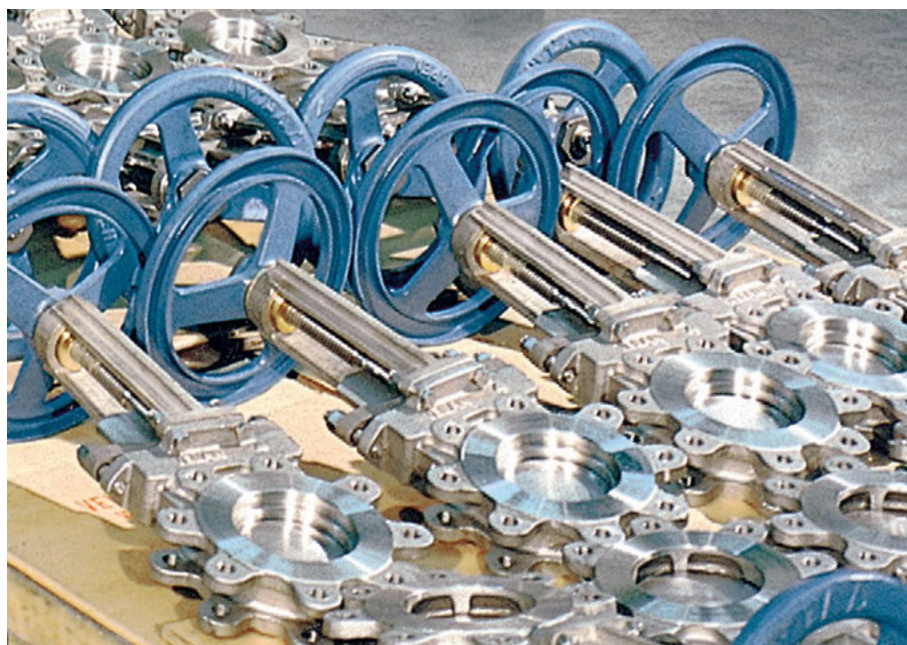
Velan is one of the world's leading manufacturers of industrial steel valves, supplying gate, globe, check, ball, triple-offset butterfly, knife gate, control, highly engineered severe service valves, and steam traps for critical applications in the chemical, petrochemical, oil and gas, fossil and nuclear power, cogeneration, pulp and paper, mining, marine and cryogenic industries. The company also supplies actuators and integrated control packages.

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.

Velan concentrates on one business—the design, manufacture and marketing of steel valves in a broad range of types and sizes for high performance service in a wide range of applications. The company's talented people are focused on Velan's core values of quality, reliability, innovation, and integrity and mission to be the world's leading valve brand.

CONTENTS

Velan's profile	2
Velan's global network	3
Standard knife gate valve design features	4
Standard knife gate valve, TAPPI	5-6
Bolted bonnet knife gate valve design features	7-8
Bolted bonnet knife gate valve	9-10
Knife gate valve options	11
Knife gate valve seating technology and design details	12
Actuators, seat maintenance, and engineering data	13
Typical bolted bonnet knife gate valve applications	14
How to order	15



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 and 5



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.



Mennecey, 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.

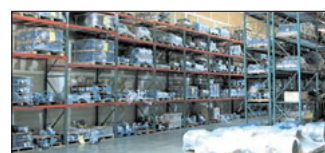


Coimbatore, India
Velan Valves India Pvt. Ltd.

Distribution centers



Granby, Canada
VelCAN



Benicia, CA, U.S.A.
VelCAL



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



Willich, Germany
Velan GmbH

VELAN STANDARD KNIFE GATE VALVE

DESIGN FEATURES

ADVANTAGES OVER FABRICATED VALVES

- Cast stainless steel body and investment cast yoke. In fabricated valves, leakage of corrosive medium due to neglected maintenance on the packing or line pressure surges cause corrosion and failure of most carbon steel, cast iron, or welded stainless steel components.
- An all stainless steel valve offers better corrosion resistance than cast iron-lined valves. The total cost of ownership becomes more attractive than the initial savings.

FIRST ALL STAINLESS STEEL KNIFE GATE VALVE

- **Rugged one-piece body.** Cast in stainless steel to eliminate corrosion problems that are found with cast iron, or steel valves lined with stainless steel.
- **All stainless steel investment cast yoke.** Up to NPS 12 (DN 300).
- **Investment cast stainless steel packing flange** the space between the blade and the packing flange is very small and critical on smaller size valves. For NPS 2–8 (DN 50–200) Velan knife gate valves feature high-precision investment cast packing flanges for a tight “contact-free” fit.

THICKER KNIFE GATE

- **Thicker knife gate** to eliminate distortion under maximum differential pressure and to provide tight seating.
- **Precision ground blade** on both sides for tighter packing chamber sealing. Sealing face of the gate is lapped to provide the best possible seat tightness.
- **Integral locking device.**
- **Precision machined beveled gate end** provides long life of seating components.
- **Gate guides and lugs.** 180° guiding for the moving gate, while jambs at the bottom hold the knife gate to assure proper seating.

RAISED FACE SEAT

- The groove around the seat permits the gate to push particles aside and prevents clogging. When the valve is open the flow cleans the groove.
- **Lapped seat** ensures tight closure.

RELIABLE PACKING CHAMBER

- Smooth and uniform chamber.
- Gate ground on both sides.
- Gland bolts easily accessible.
- Equally distributed gland bolts provide uniform compression of packing.

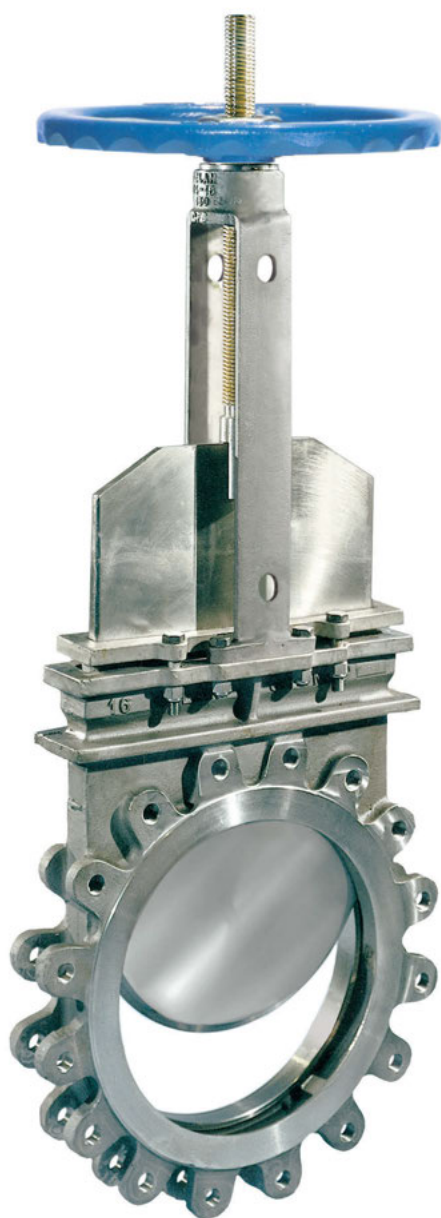
ALL NUTS SELF-LOCKING

LOW TORQUE STEM DRIVE ASSEMBLY

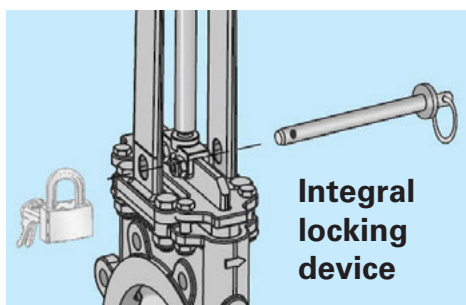
- Ni-resist or bronze thrust bearing to prevent seizure of handwheel hub, NPS 2–12 (DN 50–300) valves.
- **Needle thrust bearings** NPS 14–24 (DN 350–600) valves.
- Grease fitting.
- **Larger more comfortable malleable iron handwheel** for easier operation.
- Acid resistant Ni-resist or bronze stem nut.

FACTORY TESTING

- **Each valve is pressure tested** for seat tightness, shell and packing integrity including cycling tests to check for reliability of operation.



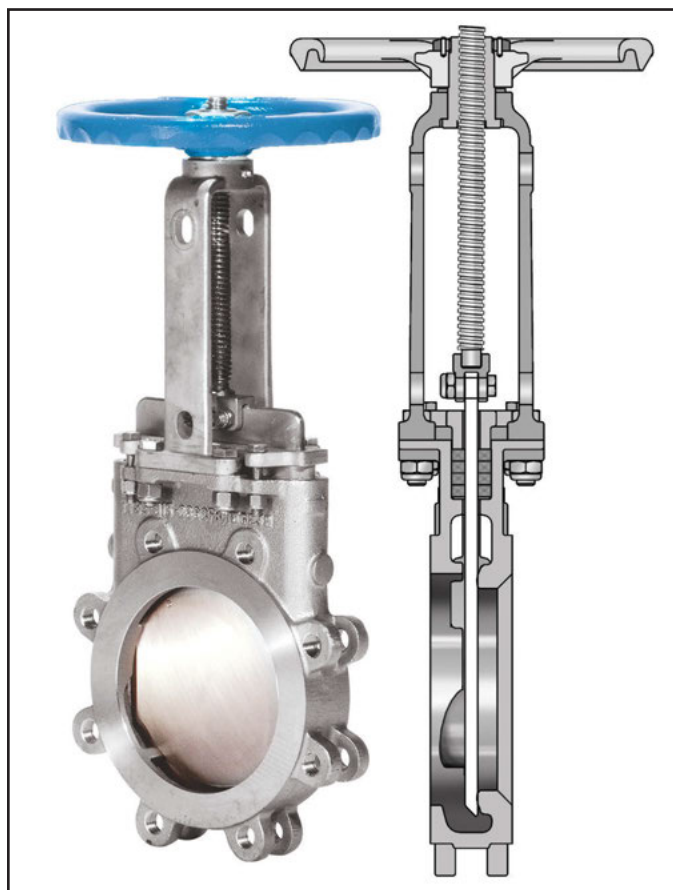
For options see page 12.



VELAN STANDARD KNIFE GATE VALVES

ALL STAINLESS STEEL WAFER-TYPE, METAL SEAT, NPS 2–24 (DN 50–600)

FULLY LUGGED, TYPE 310C TO TAPPI TIS 405-8, LARGE PORT



PART	STANDARD MATERIALS	
Body ⁽¹⁾	CF8M (SS 316)	CG3M (317L)
Knife	SS 316	SS 317L
Yoke	CF8	
Stem ⁽¹⁾	SS 316 or SS 304	
Packing flange	CF8 (SS 304)	
Stem nut	Ni-resist or bronze	
Bolt	SS 304	
Nuts	SS 304 self-locking	
Packing	Graphite and PTFE-impregnated synthetic yarn (ph: 0–14)	
Thrust bearing	Steel, NPS 14–36 (DN 350–900)	
Handwheel	Malleable iron	
Handwheel nut	Malleable iron, zinc plated	

(1) Other materials available (see page 15).

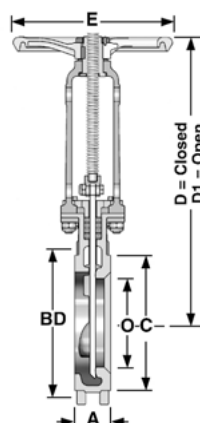
DESIGN FEATURES

- Designed to handle light slurries, pulp stock and corrosive fluids in process industries.
- Meets TAPPI standard TIS 405-8 and MSS SP-81 for wafer-type knife gate valves.
- Lug bolt pattern matches ASME B16.5 Class 150. Holes tapped.
- 150 psig (10.3 bar) maximum working pressure. 150°F (65°C) maximum working temperature. Applications outside of these conditions require special design considerations.
- These high-quality metal-seated knife gate valves, with ground knife gates and lapped seating faces, have maximum leakage rate 4-10 times less than the permissible rates shown in TAPPI 405-8 and MSS SP-81.
- Needle bearings on NPS 14–24 (DN 350–600) valves.
- Available with actuation (see page 13).

DIMENSIONS AND WEIGHTS

SIZE NPS DN	A	C	BD	Tap size in (UNC)	Number of holes	D	D1	E	Knife	O	lb kg
2 50	1.88 48	3.63 92	4.75 121	0.63-11	4	9.94 252	12.06 306	6.38 162	0.25 6.0	1.84 47	12 5
3 80	2.00 51	5.00 127	6.00 152	0.63-11	4	12.19 310	15.32 389	8.00 203	0.25 6.0	2.84 72	21 9
4 100	2.00 51	6.19 157	7.50 191	0.63-11	8	14.51 369	18.60 472	8.00 203	0.25 6.0	3.72 94	28 13
6 150	2.25 57	8.50 216	9.50 241	0.75-10	8	18.31 465	24.38 619	10.00 254	0.35 9.0	5.58 142	48 22
8 200	2.75 70	10.63 270	11.75 298	0.75-10	8	22.66 576	30.66 779	14.00 356	0.48 12.1	7.58 193	77 35
10 250	2.75 70	12.75 324	14.25 362	0.88-9	12	27.19 691	37.19 945	14.00 356	0.48 12.1	9.31 236	111 50
12 300	3.00 76	15.00 381	17.00 432	0.88-9	12	31.25 794	43.25 1099	18.00 457	0.60 15.0	11.31 287	156 71
14 350	3.00 76	16.75 425	18.75 476	1.00-8	12	35.32 897	48.69 1237	20.00 508	0.60 15.0	12.81 325	231 105
16 400	3.50 89	19.38 492	21.25 540	1.00-8	16	39.01 991	55.13 1400	20.00 508	0.69 18.0	14.81 376	289 135
18 450	3.50 89	21.00 533	22.75 578	1.12-7	16	46.58 1183	64.31 1633	24.00 610	0.83 21.0	17.25 438	452 205
20 500	4.50 114	23.00 584	25.00 635	1.12-7	20	51.31 1303	71.31 1811	24.00 610	0.94 24.0	19.25 489	583 265
24 600	4.50 114	27.25 692	29.50 749	1.25-7	20	58.69 1491	81.94 2081	24.00 610	1.06 27.0	22.88 581	784 356

(1) Gear actuators. (2) Hole spacing meets MSS SP-44.



CV AND SEAT TIGHTNESS

SIZE NPS	STANDARD Cv ⁽¹⁾	LEAKAGE ⁽²⁾ (cc/min.)	
		TAPPI ALLOW.	VELAN ACTUAL
2	340	80	0-20
3	850	120	0-20
4	1,500	160	0-40
6	3,500	240	0-60
8	6,600	320	0-80
10	9,800	400	0-100
12	15,300	480	0-100
14	19,000	560	0-100
16	25,500	640	0-100
18	36,000	720	0-100
20	45,000	800	0-100
24	60,000	960	0-100

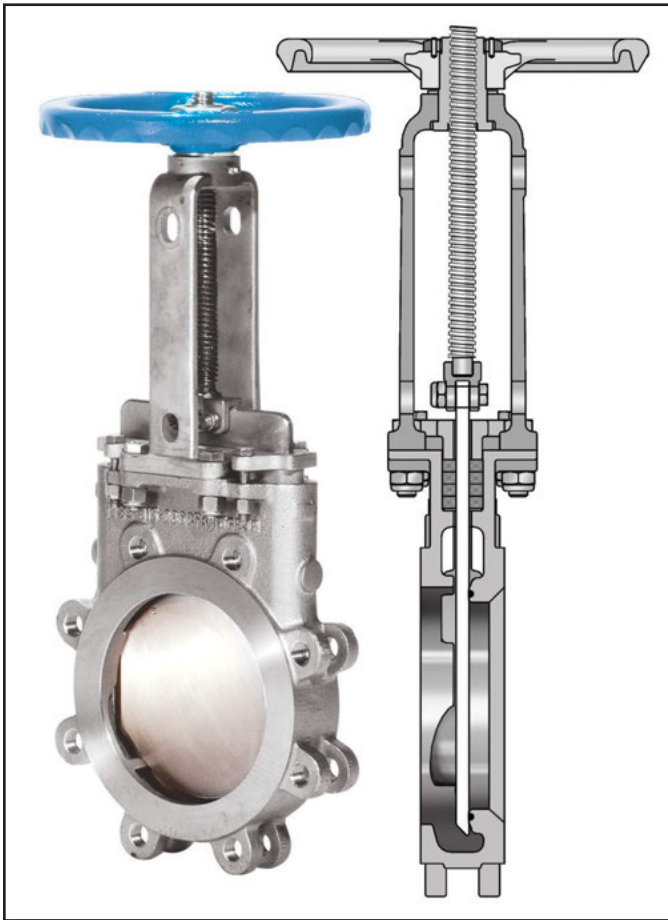
(1) Tested in accordance with ASME/ISA-575-02.

(2) Test pressure 40 psi water (TAPPI and MSS SP81).

VELAN STANDARD KNIFE GATE VALVES

WAFER-TYPE, RESILIENT SEAT, NPS 2–24 (DN 50–600)

FULLY LUGGED, TYPE 320C TO TAPPI TIS 405-8, LARGE PORT



PART	STANDARD MATERIALS	
Body ⁽¹⁾	CF8M (SS 316)	CG3M (317L)
Knife	SS 316	SS 317L
Seat ring	SS 316	SS 317L
O-ring	PTFE (standard), viton, neoprene, polyurethane, EPDM	
Yoke	CF8	
Stem ⁽¹⁾	SS 316 or SS 304	
Packing flange	CF8 (SS 304)	
Stem nut	Ni-resist or bronze	
Bolt	SS 304	
Nuts	SS 304 self-locking	
Packing	Graphite and PTFE-impregnated synthetic yarn (ph: 0-14)	
Thrust bearing	Steel, NPS 14–36 (DN 350–900)	
Handwheel	Malleable iron	
Handwheel nut	Malleable iron, zinc plated	

(1) Other materials available (see page 15).

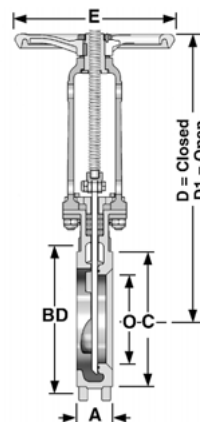
DESIGN FEATURES

- Designed to handle water, white water, pulp stock and corrosive fluids in process industries where applications call for resilient seat with zero leakage to 150 psi (10.3 bar) in main direction and limited tightness in opposite direction, at low pressure.
- Replaceable, resilient crimped seat rings on NPS 18 (DN 450) and larger.
- Meets TAPPI standard TIS 405-8 and MSS SP-81 for wafer-type knife gate valves.
- Non-clogging large port.
- 150 psig (10.3 bar) maximum working pressure. 150°F (65°C) maximum working temperature. Applications outside of these conditions require special design considerations.
- Needle bearings on NPS 14–24 (DN 350–600) valves.
- Available with Air actuation (see page 13).
- Lug bolt pattern matches ASME B16.5 Class 150. Holes tapped.

DIMENSIONS AND WEIGHTS

SIZE NPS DN	A	C	BD	Tap size in (UNC)	Number of holes	D	D1	E	Knife	O	lb kg
2	1.88	3.63	4.75	0.63-11	4	9.94	12.06	6.38	0.25	1.84	12
50	48	92	121			252	306	162	6.0	47	5
3	2.00	5.00	6.00	0.63-11	4	12.19	15.32	8.00	0.25	2.84	21
80	51	127	152			310	389	203	6.0	72	9
4	2.00	6.19	7.50	0.63-11	8	14.51	18.60	8.00	0.25	3.72	28
100	51	157	191			369	472	203	6.0	94	13
6	2.25	8.50	9.50	0.75-10	8	18.31	24.38	10.00	0.35	5.56	48
150	57	216	241			465	619	254	9.0	141	22
8	2.75	10.63	11.75	0.75-10	8	22.66	30.66	14.00	0.48	7.56	77
200	70	270	298			576	779	356	12.1	192	35
10	2.75	12.75	14.25	0.88-9	12	27.19	37.19	14.00	0.48	9.31	111
250	70	324	362			691	945	356	12.1	236	50
12	3.00	15.00	17.00	0.88-9	12	31.25	43.25	18.00	0.60	11.31	156
300	76	381	432			794	1099	457	15.0	287	71
14	3.00	16.75	18.75	1.00-8	12	35.32	48.69	20.00	0.60	12.81	231
350	76	425	476			897	1237	508	15.0	325	105
16	3.50	19.38	21.25	1.00-8	16	39.01	55.13	20.00	0.69	14.81	289
400	89	492	540			991	1400	508	18.0	376	135
18	3.50	21.00	22.75	1.12-7	16	46.58	64.31	24.00	0.83	17.25	452
450	89	533	578			1183	1633	610	21.0	438	205
20	4.50	23.00	25.00	1.12-7	20	51.31	71.31	24.00	0.94	19.25	583
500	114	584	635			1303	1811	610	24.0	489	265
24	4.50	27.25	29.50	1.25-7	20	58.69	81.94	24.00	1.06	22.78	784
600	114	692	749			1491	2081	610	27.0	579	356

(1) Gear actuators. (2) Hole spacing meets MSS SP-44.



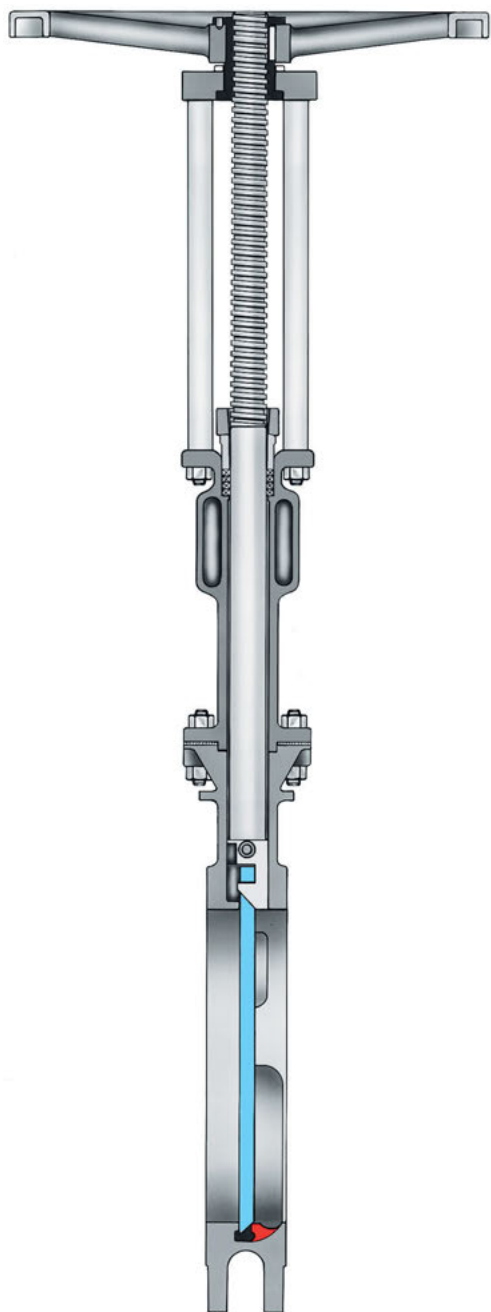
CV AND SEAT TIGHTNESS

SIZE NPS	STANDARD Cv ⁽¹⁾	LEAKAGE ⁽²⁾ (cc/min.) MAIN SEAT 1–150 PSI
2	340	0
3	850	0
4	1,500	0
6	3,500	0
8	6,600	0
10	9,800	0
12	15,300	0
14	19,000	0
16	25,500	0
18	36,000	0
20	45,000	0
24	60,000	0

(1) Tested in accordance with ASME/ISA-575-02.

(2) Test pressure 40 psi (2.8 bar) water (TAPPI and MSS SP81).

VELAN BOLTED BONNET KNIFE GATE VALVE



DESIGN FEATURES

NO LEAKAGE TO THE EXTERIOR THROUGH PACKING CHAMBER (UNLIKE STANDARD KNIFE GATE VALVES)

- **Bonneted design.** Standard flanged body-bonnet joint with an efficient non-asbestos reinforced fiber or PTFE gasket.
- **Long-life leakproof stem seal.** Standard cylindrical packing chamber with 125 RMS wall finish, burnished non-rotating stem and PTFE or graphite packing rings. *Far exceeds the cycle life of a standard knife gate valve.*
- **Virtually no contamination of the environment.** No dewatering of stock, unlike standard knife gate valves.
- **Easy repacking in-line.** (Valve should be de-pressurized when repacking in-line.)

TIGHTER SEATS WITH POSITIVE TORQUE CLOSURE OF KNIFE

- **Beveled knife-stem connection** locks the knife blade tight against the seat. The seat is sealed by *positive torque closure*—not media pressure—unlike most other knife gate valves.
- **Raised-face seat.** A groove around the seat collects particles pushed aside by the knife and prevents clogging. When the valve opens, media pressure cleans the groove.
- **Lapped seat** ensures tight closure.
- **Crimped resilient seat** ensures longer service life (see page 12).
- **Two seat designs:** Integral and resilient (see page 11).

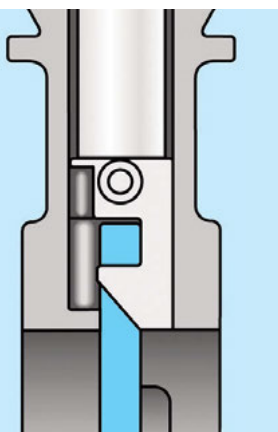
EASY OPERATION

- **Lower running torque** due to reduced friction. Friction between stem and packing in bolted bonnet knife gate valve is far less than the friction between the blade and the packing in a standard knife gate valve.
- **Low-friction, acid-resistant Ni-resist stem nut.**
- **Valves can operate with smaller actuators** than standard knife gate valves, due to lower running torque.

ALL CAST STAINLESS STEEL DESIGN

- **One-piece stainless steel,** fully-lugged, cast body is stronger than welded bodies and less subject to distortion due to thermal stress. Posts are stainless steel instead of chrome-plated carbon steel for longer life.
- **Designed for vertical or horizontal** line operations.
- **Standard wafer, TAPPI face-to-face** for easy replacement of leaky standard knife gate valves.
- **Maintenance and adjustment-free.** Long cycle life.
- **Suitable for most pulp and paper applications.** Can be used throughout the mill as a general-purpose knife gate valve up to 5% pulp consistency.

Unique
beveled
knife-stem
connection



VELAN BOLTED BONNET KNIFE GATE VALVE

DESIGN FEATURES

PROVIDES POSITIVE SEATING ON THE BOTTOM AND THE TOP OF THE BLADE

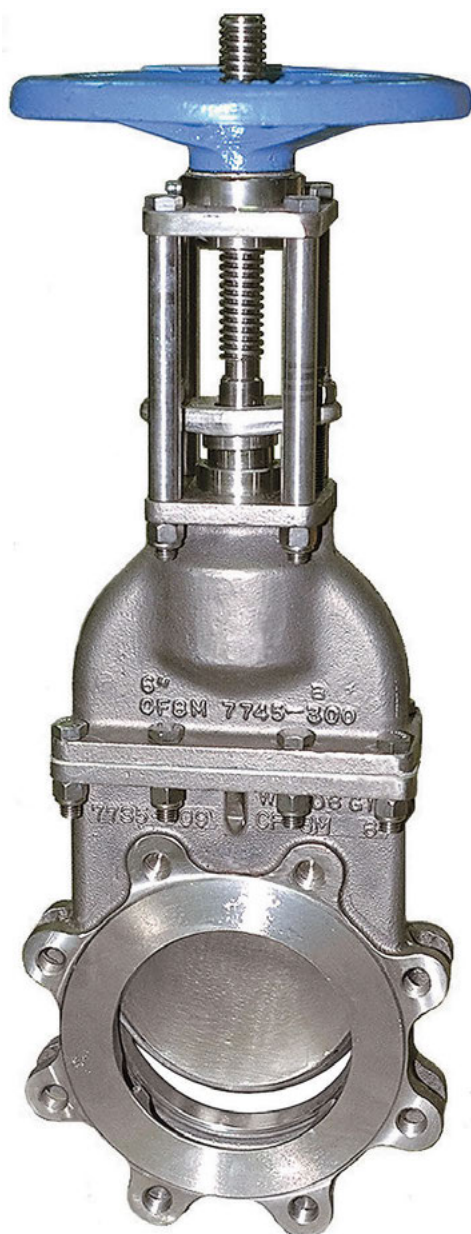
- **Unique knife-stem connection.** Unlike any other design, the stem head slides inside a circular cavity on the stem guides in the body and bonnet, and is connected to the knife blade by a taper slot. A cam follower prevents the stem from rotating.

- **Handwheel torque or actuator force provides positive seat-knife closure.** During closure, the stem slides down pushing the knife into contact with the two bottom body lugs. The taper stem head then transfers a vertical closing force to a lateral force, which positively seats the top of the knife against the seat face.

Stem force, not line pressure, maintains seating contact in this unique design, ensuring tight seating in both directions (see alternative seat designs on page 11). During the opening and closing cycle, the guides ensure proper alignment of the knife.

BYPASS TO PREVENT CLOGGING OF BONNET

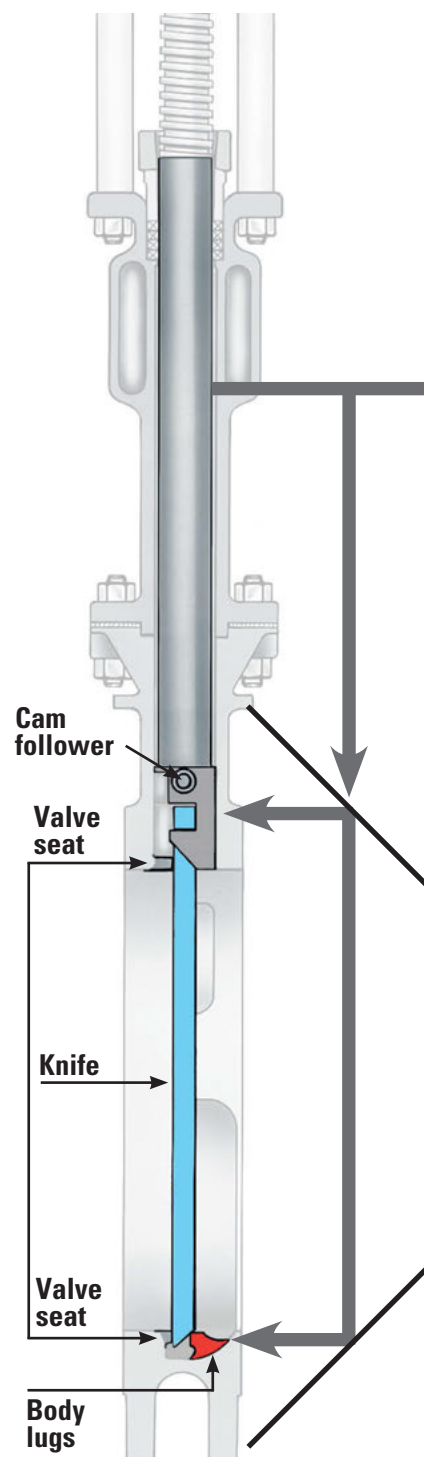
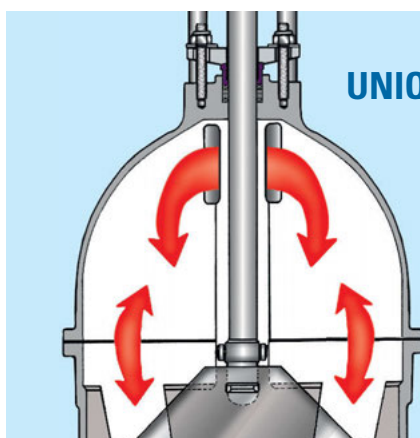
- **Bypass** lets pulp circulate inside the bonnet when valve is opened, preventing clogging.



UNIQUE ANTI-CLOGGING DESIGN

The bonnet and body are specially designed to permit pulp circulation.

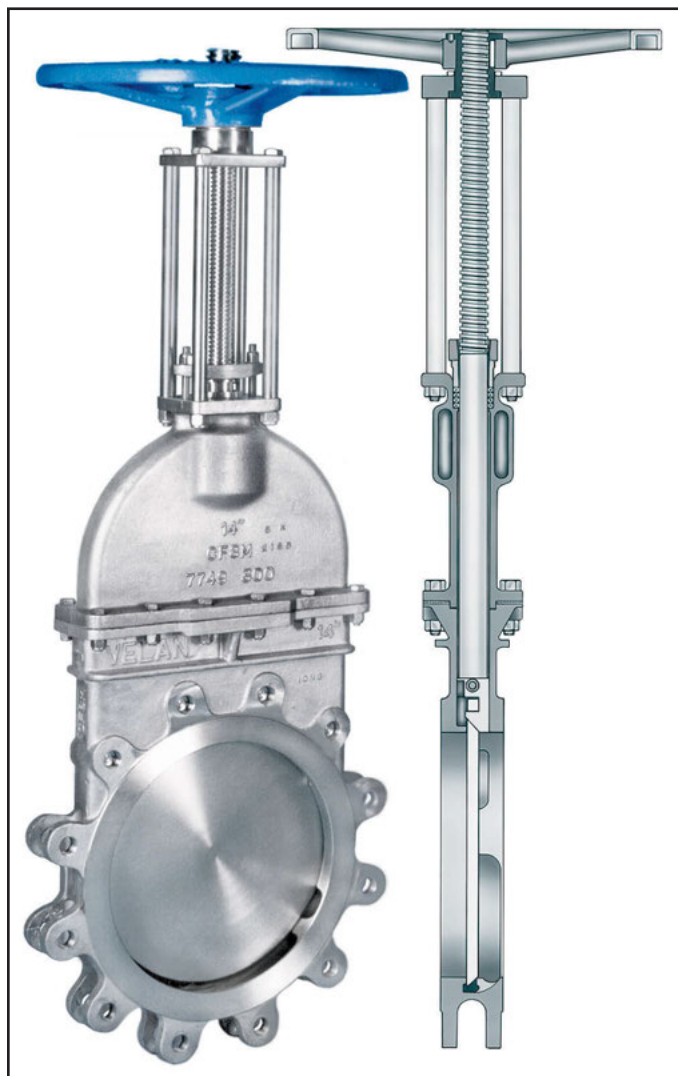
This prevents clogging up to a consistency of 5%.



VELAN BOLTED BONNET KNIFE GATE VALVES

ALL STAINLESS STEEL FULL PORT, METAL SEAT, NPS 4–24 (DN 100–600)

FULLY LUGGED, TYPE 310B, FOR BI-DIRECTIONAL SHUTOFF UP TO 150 PSI (10.3 BAR)



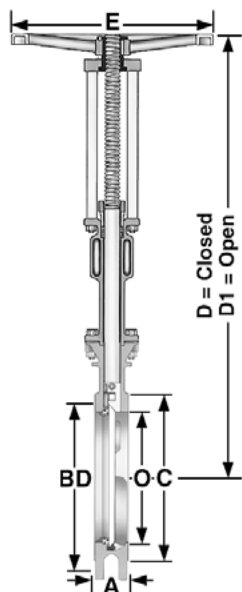
PART	STANDARD MATERIALS	
Body ⁽¹⁾	CF8M (SS316)	CG8M (SS317)
Bonnet	CF8M	CG8M
Post	SS316	
Knife	SS316	SS317
SEAT	Integral	CF8M (SS316)
	Hardfaced	CG8M (SS317)
	CoCr alloy	
Stem ⁽¹⁾	SS316/SS 304	SS317
Stem nut	Ni-resist or bronze	
Gland bushing	SS316 or SS304	
Packing flange	CF8M or CF8	
Bolt	SS304 or SS316	
Nuts	SS304 (self-locking) or SS316	
Packing	Graphite and PTFE-impregnated synthetic yarn (ph: 0-14)	
Cam follower	SS316	SS317
Gasket	PTFE or reinforced fiber	
Handwheel	Malleable iron	

(1) Other materials available (see page 15).

DESIGN FEATURES

- All stainless steel construction.
- Seat tightness achieved with torque as opposed to line pressure.
- Suitable for bi-directional operation.
- Thoroughly tested in a variety of applications including: clean pulp up to a consistency of 5%, waste water and secondary effluent.
- Bypass unit cast into the bonnet prevents clogging.
- Conventional packing chamber eliminates leakage problems associated with standard knife valves.
- 150 psig (10.3 bar) maximum working pressure.
- 150°F (65°C) maximum working temperature.
- Lug bolt pattern matches ASME B16.5 Class 150. Holes tapped.

For Cv and seat tightness chart on page 5.



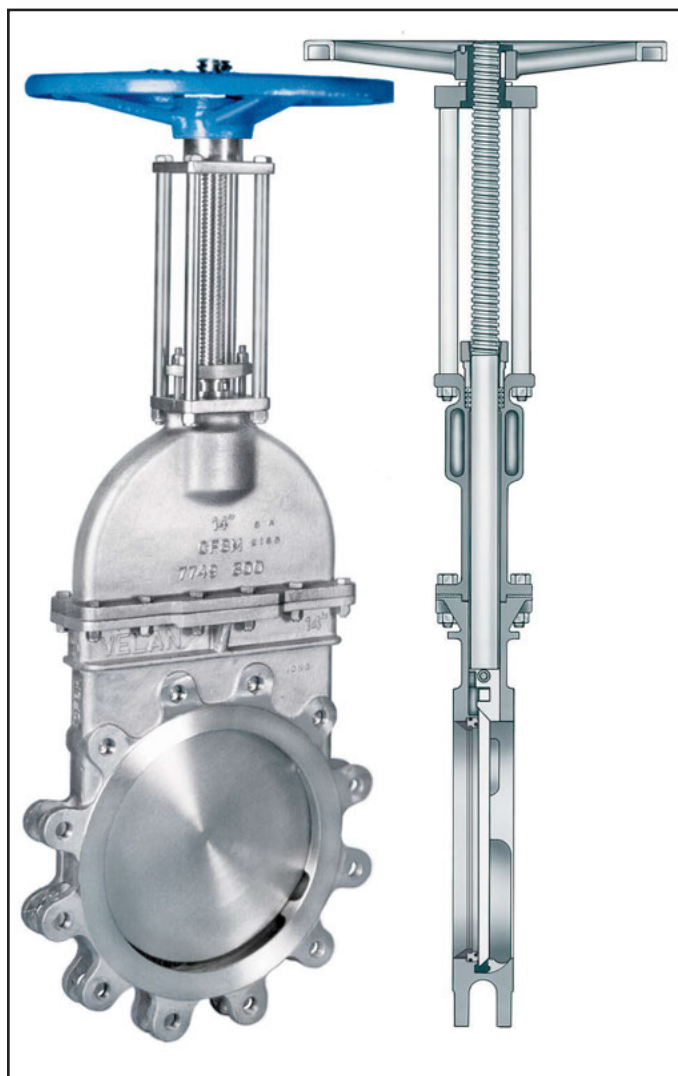
DIMENSIONS AND WEIGHTS

SIZE NPS DN	A	C	BD	Tap size in (UNC)	Number of holes	D	D1	E	Knife	O Metal seat	WEIGHT lb kg
4 100	2.00 51	5.91 150	7.50 191	0.625-11	8	17.00 432	21.00 533	8.00 203	0.35 9	3.95 100	33.50 12.5
6 150	2.25 57	8.50 216	9.50 241	0.75-10	8	22.25 565	28.34 720	10 254	0.40 10	5.75 146	65 29.5
8 200	2.75 70	10.62 270	11.75 298	0.75-10	8	27.37 695	35.75 908	10 254	0.57 14	7.88 200	95 43.1
10 250	2.75 70	12.75 324	14.25 362	0.88-9	12	33.50 851	43.68 1109	14 356	0.57 14	9.88 251	155 70.3
12 300	3.00 76	15.00 381	17.00 432	0.88-9	12	38.56 979	50.62 1286	14 356	0.65 16.5	11.75 298	190 86.2
14 350	3.00 76	16.25 413	18.75 476	1.00-8	12	42.43 1078	56.00 1422	14 356	0.65 16.5	13.25 337	230 104.3
16 400	3.50 89	18.50 470	21.25 540	1.00-8	16	47.63 1210	63.00 1600	18 457	0.69 17	15.25 387	315 142.9
18 450	3.50 89	21.00 533	22.75 578	1.12-7	16	53.25 1353	70.68 1795	18 457	0.83 21	17.25 438	475 215.5
20 500	4.50 114	23.00 584	25.00 635	1.12-7	20	58.87 1495	78.37 1991	18 457	0.94 24	19.25 489	650 294.8
24 600	4.50 114	27.25 692	29.50 749	1.25-7	20	68.43 1738	91.53 2325	20 508	0.94 24	22.88 518	890 403.7

VELAN BOLTED BONNET KNIFE GATE VALVES

ALL STAINLESS STEEL FULL PORT, RESILIENT SEAT, NPS 4–24 (DN 100–600)

FULLY LUGGED, TYPE 320B, FOR BI-DIRECTIONAL SHUTOFF UP TO 150 PSI (10.3 BAR)



PART	STANDARD MATERIALS	
Body ⁽²⁾	CF8M (SS316)	CG8M (SS317)
Bonnet	CF8M	CG8M (SS317)
Post	SS316	
Knife	SS316	SS317
Seat ⁽¹⁾	PTFE	
Stem ⁽²⁾	SS316/SS 304	SS317
Stem nut	Ni-resist or bronze	
Gland bushing	SS316 or SS304	
Packing flange	CF8M or CF8	
Bolt	SS304 or SS316	
Nuts	SS304 (self-locking) or SS316	
Packing	Graphite and PTFE-impregnated synthetic yarn (ph: 0-14)	
Cam follower	SS316	SS317
Gasket	PTFE or reinforced fiber	
Handwheel	Malleable iron	

(1) PTFE recommended as standard. Other materials available.

(2) Other materials available (see page 15).

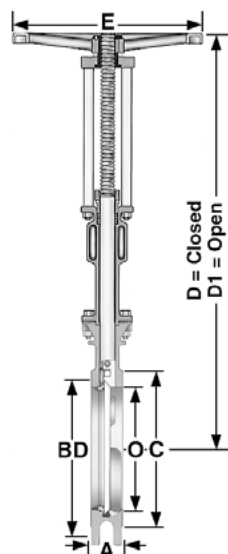
DESIGN FEATURES

- All stainless steel construction.
- Seat tightness achieved with torque as opposed to line pressure.
- Suitable for bi-directional operation.
- Thoroughly tested in a variety of applications including white water and weak black liquor.
- Bypass unit cast into the bonnet prevents clogging.
- Conventional packing chamber eliminates leakage problems associated with standard knife valves.
- 150 psig (10.3 bar) maximum working pressure. 150°F (65°C) maximum working temperature.
- Lug bolt pattern matches ASME B16.5 Class 150. Holes tapped.

For Cv and seat tightness chart on page 5.

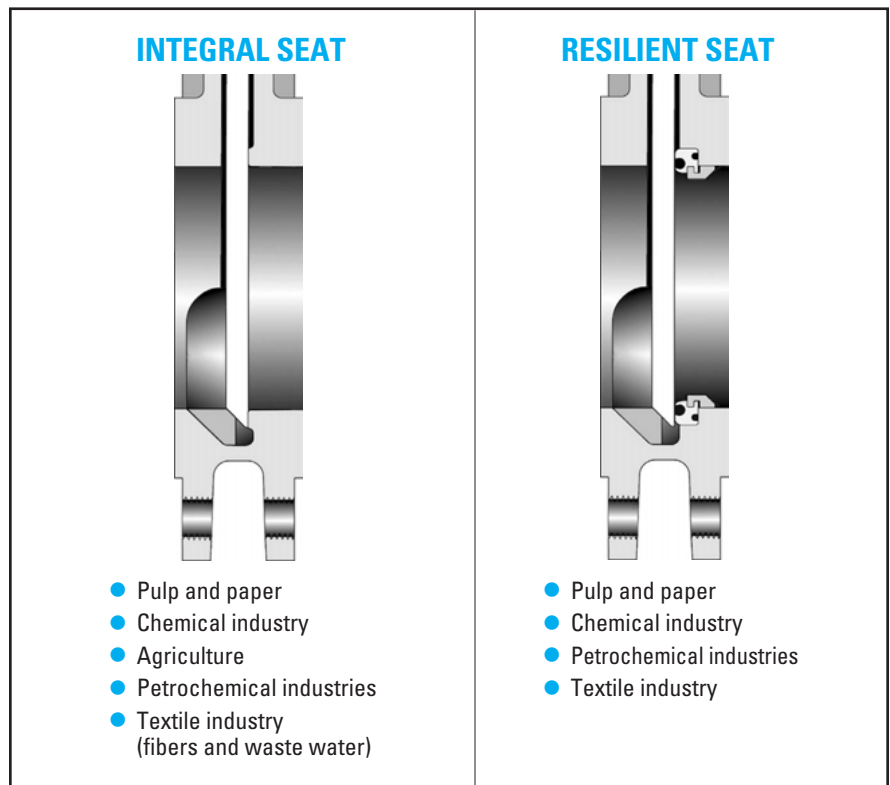
DIMENSIONS AND WEIGHTS

SIZE NPS DN	A	C	BD	Tap size in (UNC)	Number of holes	D	D1	E	Knife	O Resilient seat	WEIGHT lb kg
4 100	2.00 51	5.91 150	7.50 191	0.625-11	8	17.00 432	21.00 533	8.00 203	0.35 9	3.47 100	33.50 12.5
6 150	2.25 57	8.50 216	9.50 241	0.75-10	8	22.25 565	28.34 720	10 254	0.40 10	5.59 142	65 29.5
8 200	2.75 70	10.62 270	11.75 298	0.75-10	8	27.37 695	35.75 908	10 254	0.57 14	7.59 193	95 43.1
10 250	2.75 70	12.75 324	14.25 362	0.88-9	12	33.50 851	43.68 1109	14 356	0.57 14	9.59 244	155 70.3
12 300	3.00 76	15.00 381	17.00 432	0.88-9	12	38.56 979	50.62 1286	14 356	0.65 16.5	11.34 288	190 86.2
14 350	3.00 76	16.25 413	18.75 476	1.00-8	12	42.43 1078	56.00 1422	14 356	0.65 16.5	12.84 326	230 104.3
16 400	3.50 89	18.50 470	21.25 540	1.00-8	16	47.63 1210	63.00 1600	18 457	0.69 17	14.84 377	315 142.9
18 450	3.50 89	21.00 533	22.75 578	1.12-7	16	53.25 1353	70.68 1795	18 457	0.83 21	16.81 427	475 215.5
20 500	4.50 114	23.00 584	25.00 635	1.12-7	20	58.87 1495	78.37 1991	18 457	0.94 24	18.81 478	650 294.8
24 600	4.50 114	27.25 692	29.50 749	1.25-7	20	68.43 1738	91.53 2325	20 508	0.94 24	22.78 579	890 403.7



VELAN KNIFE GATE VALVE OPTIONS

OPTIONAL SEAT DESIGNS



EASY MAINTENANCE



Easy seat maintenance due to replaceable seat retainer ring on standard knife gate valves from NPS 18–24 (DN 450–600) and bolted bonnet knife gate valves from NPS 4–24 (DN 100–600).

Simply grinding off the seat ring retainers on the valve body permits extraction of the seat through the packing chamber. Since Velan features a crimped seat, the O-ring cannot be replaced. A new seat ring, including a crimped O-ring, can easily be put back into place and secured there by tack welding the retainers.

This operation can be done many times, ensuring that the Velan knife gate valve gives years of reliable service.

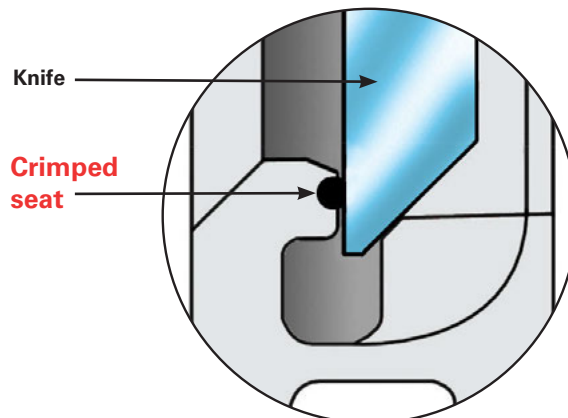
For complete maintenance procedure including important pipe flange bolt torquing specifications, please refer to the knife gate valve maintenance manual VEL-KGVM.

STANDARD KNIFE GATE VALVES NPS 2–16 (DN 50–400)

Integral crimped resilient seat

A NEW INTEGRAL CRIMPED RESILIENT SEAT IS NOW STANDARD ON NPS 2–16 (DN 50–400) STANDARD KNIFE GATE VALVES

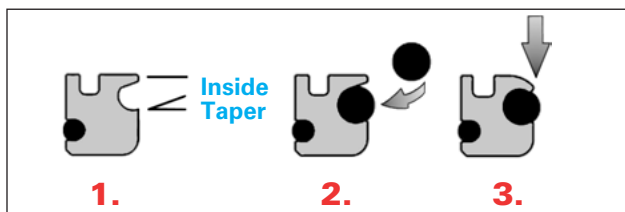
Old “snap-in” style seats could be too easily extracted accidentally by friction caused by heavy or infrequent cycling. Velan’s new “crimped seat” makes accidental extraction virtually impossible. The seat will wear normally but the crimped design keeps it tight inside the seat retainer ring for a longer cycle life.



STANDARD KNIFE GATE VALVES NPS 18–24 (DN 450–600) AND ALL SIZES OF BOLTED BONNET KNIFE GATE VALVES

Stainless steel seat ring with replaceable crimped resilient seat option prevents accidental extraction

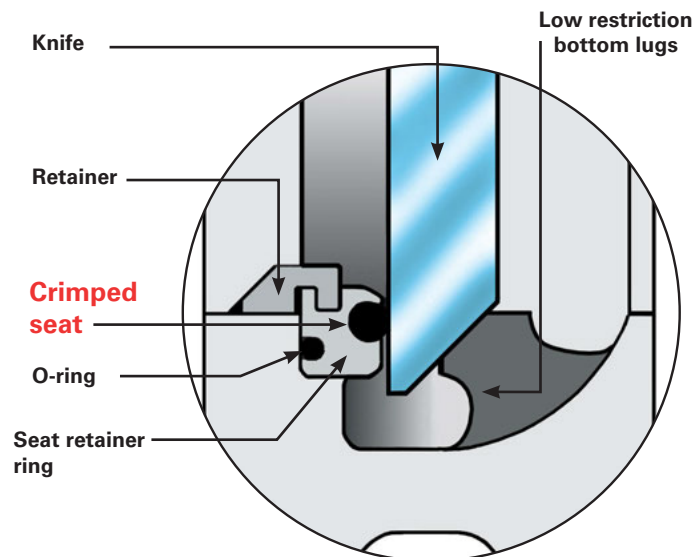
CRIMPING THE SEAT STEP-BY-STEP



- 1.** The stainless steel seat ring is manufactured with a slight inside taper.
- 2.** The O-ring is inserted.
- 3.** Seat ring is progressively crimped on a lathe to imprison the O-ring in it.

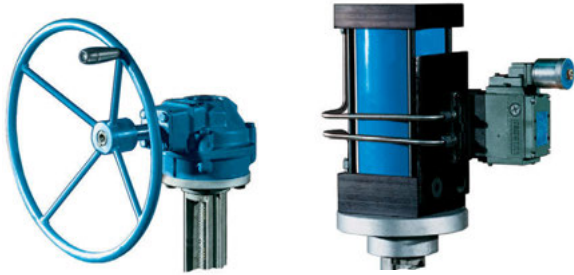
LOW RESTRICTION LUGS BOTTOM

An important breakthrough in bottom lug design for pulp and paper applications, the Velan bolted bonnet knife gate valve features a bottom lug that permits longer fibers to circulate on each side preventing clogging during closing. This improvement is currently available on most sizes.



STANDARD RESILIENT SEAT MATERIAL		
TYPE	MAX. TEMP.	USE
Viton, standard on bolted bonnet knife gate valve	400°F	Chemicals
PTFE	400°F	Pulp and paper waste water

ACTUATORS



OPERATION

Handwheel, bevel gear, on-off air cylinder actuators.

GEAR ACTUATORS

Our standard handwheels suffice to reduce rimpull to acceptable levels. An optional VT-20 gear actuator can be supplied for NPS 16–24 (DN 400–600) valves.

CYLINDER ACTUATORS

Various types of cylinders are available for operating Velan knife gate valves. The most commonly used cylinders are operated by air.

In most designs, the valve stem serves as a piston rod, with the knife fastened directly to the actuator. Actuators with double-ended piston rod option can be supplied to install position indicators or limit switches and for connecting an emergency device for manual actuation of the valve.

Handwheels and gear boxes can be mounted on top of the cylinders for emergency operation due to loss of operating medium in the cylinder.

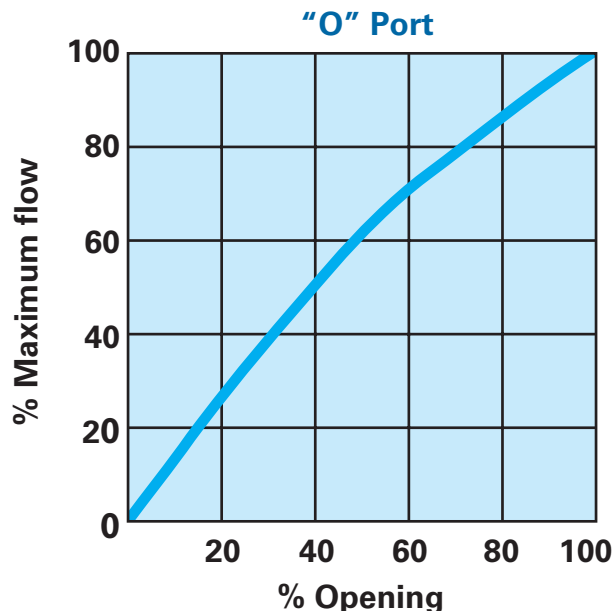
If specified by the customer, Velan valves can be furnished with mounting pads for most steel cylinders or valve positioners for throttling control.

BORE DIAMETER (in) FOR DOUBLE-ACTING PNEUMATIC ACTUATOR																
Valve size NPS	MAXIMUM DIFFERENTIAL PRESSURE (PSI)															
	40		50		60		70		80		100		125		150	
	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B
2	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—
3	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—	3¼	—
4	4	3¼	4	3¼	4	3¼	4	3¼	4	3¼	4	3¼	4	3¼	4	3¼
6	5	3¼	5	3¼	5	3¼	5	3¼	5	3¼	5	4	5	4	5	5
8	5	3¼	5	4	6	4	6	4	6	5	6	5	6	6	7	6
10	6	4	6	5	6	5	6	5	6	6	7	6	7	7	8	7
12	7	5	7	5	7	6	7	6	7	6	8	7	10	8	10	8
14	7	5	7	6	7	6	8	7	8	7	10	8	10	10	10	10
16	8	6	8	7	8	7	10	8	10	8	10	10	12	10	12	12
18	10	7	10	7	10	8	10	8	10	10	12	10	12	12	14	12
20	10	7	10	8	10	10	12	10	12	10	12	12	14	12	14	14
24	12	8	12	10	12	10	14	12	14	12	14	14	16	14	18	16

NOTE: Above sizes are based on 80 psi air pressure.
C = conventional B = bolted bonnet

ENGINEERING DATA

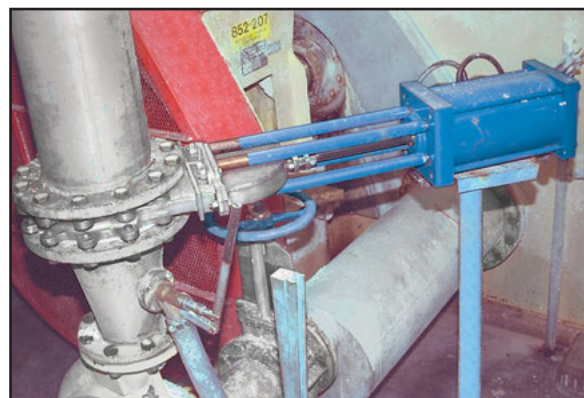
Flow chart characteristics



IN-SERVICE PHOTOS

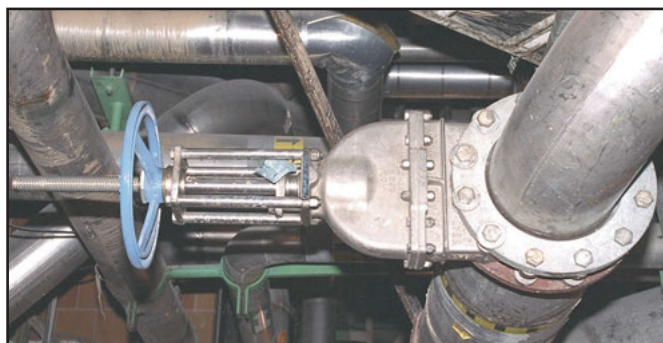


Centrifugal cleaner isolation. Pressure around 25-35 psi (1.7-2.4 bar) 2.5% pulp.



Pump discharge shutoff 5% pulp at 70 psi (4.8 bar) cycling over 75 times a day.

Due to unique torque closure of its seat, the Velan bolted bonnet knife gate valve is an ideal solution for low-pressure, high-cycling, environmentally sensitive services and bi-directional applications.



Post refiner line isolation.















Multiple pump discharge isolation with pressure 70-90 psi (4.8-6.2 bar) white water.



Filter isolation installation.

HOW TO ORDER KNIFE GATE VALVES

Type of connection	Size of connection	Pressure rating	Type	Face-to-face and design	Body material	Seat surface	Packing
A	B	C	D	E	F	G	H
	 		 	 	 		
L	1 4	— 0	3 1	0 C —	1 3	S	L

Example: Lug NPS 6 (DN 150) class 150 metal-seated cast stainless steel knife gate valve.

A	TYPE OF CONNECTION
L	Lug

B	SIZE OF CONNECTION
Customers have the choice of specifying valve size as part of the valve figure number (B) using the numbers below, or indicating valve size separately. Sizes shown in NPS (DN)	
EXAMPLES: L 14 - 0310C - 13SL (valve size is part of figure number) NPS 6 0310C - 13SL (valve size is shown separately)	
08	2 (50)
09	2½ (65)
10	3 (80)
12	4 (100)
14	6 (150)
15	8 (200)
16	10 (250)
18	12 (300)
19	14 (350)
20	16 (400)
21	18 (450)
22	20 (500)
23	22 (550)
24	24 (600)

C	PRESSURE RATING
0	150

D	TYPE
31	Metal seat
32	Resilient seat

E	FACE-TO-FACE	DESIGN
0	Tappi standard (wafer)	B Cast (bolted bonnet) C Cast (bonnetless)

F	BODY MATERIAL
13	CF8M ⁽¹⁾
14	CF3M
28	CG8M
29	CG3M
35	(254SMO) CK3MCuN

(1) Forged F316 material code "13", is not suitable for temperatures above 1000°F (538°C) as it is dual certified (F316/F316L).

G	STANDARD SEAT SURFACE
B	Viton
F	Teflon
S	Integral

H	PACKING
C	Graphite/inconel
F	PTFE 0-14 ph
G	Graphite 0-14 ph
L	Spun synthetic 4-10 ph
T	PTFE/Graphite 0-14 ph

The figure numbers shown on this key are designed to cover essential features of Velan valves. Please use figure numbers to ensure prompt and accurate processing of your order. A detailed description must accompany any special orders.

MATERIAL SPECIFICATIONS

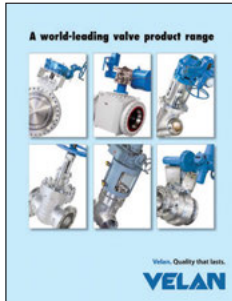
ASTM DESIGNATION		Cast					Bar stock		Plate
		316	316L	317	317L		316	304	316
		A351 CF8M	A351 CF3M	A351 CG8M	A351 CG3M	CK3MCuN			
Composition %	Carbon	0.08	0.03	0.08	0.03	0.03	0.08	0.08	0.08
	Manganese	1.50	1.50	1.50	1.50	1.20	2.00	2.00	2.00
	Phosphorus	0.04	0.04	0.04	0.04	0.05	0.045	0.04	0.045
	Sulphur	0.04	0.04	0.04	0.04	0.01	0.030	0.03	0.03
	Silicon	1.50	1.50	1.5	1.50	1.00	1.00	1.00	0.75
	Nickel	9.00–12.00	9.00–13.00	9.00–13.00	9.00–13.00	18.00–20.00	10.00–14.00	8.00–10.50	10.00–14.00
	Chromium	18.00–21.00	17.00–21.00	18.00–21.00	18.00–21.00	20.00–21.00	1.00–18.00	18.00–20.00	16.00–18.00
	Molybdenum	2.00–3.00	2.00–3.00	3.00–4.00	3.00–4.00	6.00–7.00	2.00–3.00	—	2.00–3.00
Heat treatment		Solution anneal water quench or rapid cool							
Tensile ksi min.		70	70	75	75	80	75	75	75
Yield ksi min.		30	30	35	35	38	30	30	30
Elong. % min.		30	30	25	25	35	30	30	40
R. area % min.		—	—	—	36	—	40	40	—
Hardness HB max.		—	—	—	—	—	187	187	217
Parts		Body, bonnet					Stem, post		Knife

NOTICE

- Knife gate valves should preferably not be opened or closed against reverse pressure.
- Lugs should not be overtightened to adjust for misalignment in piping.
- Velan reserves the right to take exception to warranty when misapplications / third party automation and other operations are carried out without Velan's prior knowledge.
- Consult Velan sales for standard factory warranty.

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

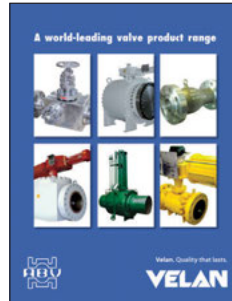
ASME pressure classes 150–4500 in carbon, alloy, and stainless steel



BRO-FLB



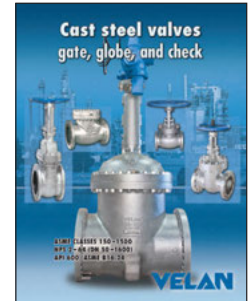
SAS-FLB



ABV-FLB



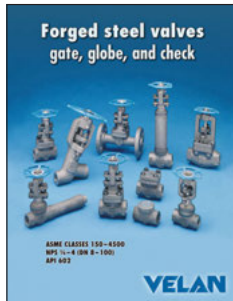
VEL-PS



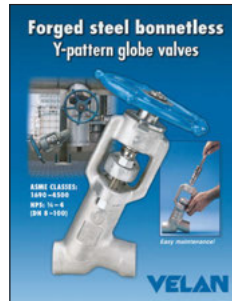
CAT-CSV



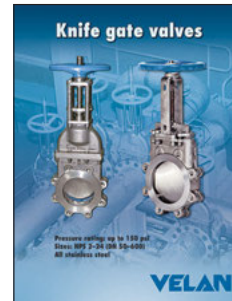
CAT-CSSV



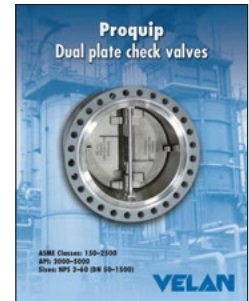
CAT-SFV



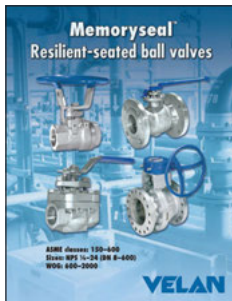
CAT-BG



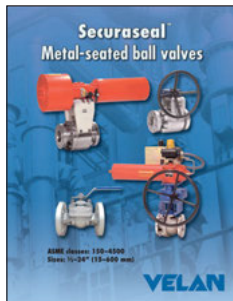
CAT-KGV



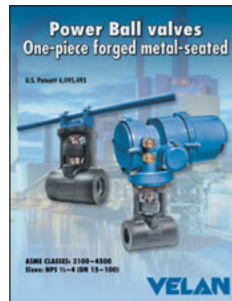
CAT-DPCV



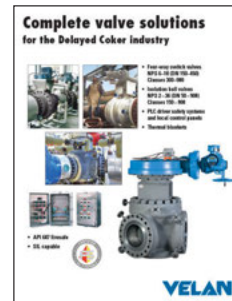
CAT-BV



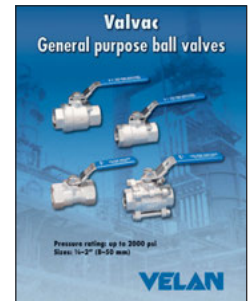
VEL-MS



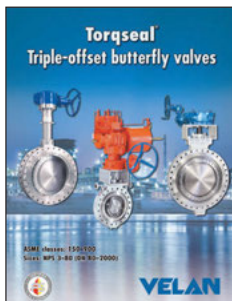
CAT-PBV



BRO-CBV



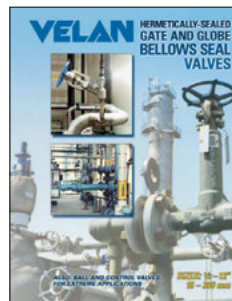
CAT-GPBV



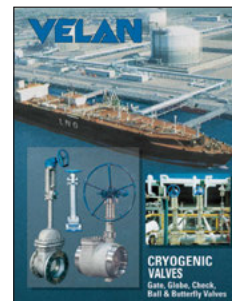
CAT-BF



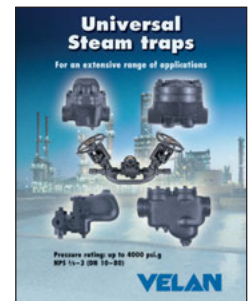
SAS-CCV



VEL-BS



VEL-CRYO



CAT-ST

Headquartered in Montreal, Canada, Velan has several international subsidiaries. For general inquiries:

Velan head office

7007 Côte de Liesse, Montreal, QC H4T 1G2 Canada

Tel: +1 514 748 7743 Fax: +1 514 748 8635

Check our website for more specific contact information.

www.velan.com

CAT-KGV-07-17

Printed in Canada

© 2017 Velan Inc., Montreal, QC, Canada. All rights reserved. The contents hereof are confidential and proprietary to Velan. Any unauthorized reproduction or disclosure, in whole or in part, is strictly prohibited. The material in this catalog is for general information only and shall not be used for specific performance data and material selection without first consulting Velan. Velan reserves the right to change this information without notice. Velan does not accept any liability or damages arising from the use of information in this catalog. Velan, Velan Ultraflex, Steamless, Moss, Torqseal, Memoryseal, Securaseal, Velflex, Rama, Clama, Adareg, and Rama Clama II are trademarks or registered trademarks of Velan Inc. and/or another Velan company. One or more of these trademarks are registered in certain countries/regions, please contact Velan Inc.'s legal department for further information. All other trademarks and registered trademarks are owned by their respective companies.

VELAN