

VTP-2000

Three-piece ball valves

Pressure rating:
1500–2000 WOG

Sizes: ½–2"
(15–50 mm)

Full compliance to
ASME B16.34

Fire-tested to API 607
Rev. 5 / ISO 10497



VELAN

VTP-2000 OVERVIEW

VELAN 3-PIECE REGULAR AND FULL PORT BALL VALVE THREADED OR SOCKET WELD ENDS, 1500–2000 WOG

REGULAR PORT: 3/4–2" (20–50mm) , FULL PORT: 1/2–2" (15–50mm)

Velan is one of the world's leading manufacturers of industrial steel gate, globe, check, ball, butterfly and engineered severe service valves. Founded in 1950, Velan has become a leader in designing and manufacturing high quality valves built for low emissions, simple maintenance and long, reliable service life.

For over 40 years, Velan resilient-seated ball valves have been providing superior performance in a broad range of applications in the chemical, refining and petrochemical, oil and gas, power generation, pulp and paper, mining, water and wastewater, and HVAC industries.

Velan offers a complete range of resilient-seated ball valves and continues to innovate in this competitive market.

Headquartered in Montreal, Canada, Velan has several international subsidiaries.

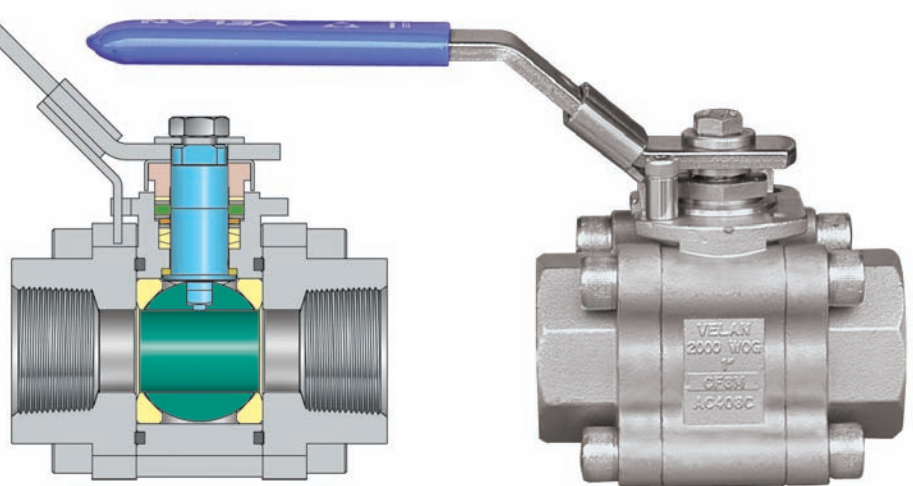
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Velan's new VTP-2000 3-Piece Ball Valve is a high performance general use ball valve, ideal for a wide variety of services. Designed for simple, in-line maintenance, and long, reliable service life, this resilient-seated ball valve offers sophisticated technical features that enable superior performance at an economical cost:

- Full compliance to ASME B16.34
- Available fire-tested to API 607 Rev. 5/ISO 10497
- MPTFE seats
- PEEK thrust washer prevents galling and protects against deformation
- Live-loaded 3-way stem seal
- ISO 5211 mounting pad simplifies actuation
- Stainless steel handle with locking device (standard)
- In-line maintenance capability
- Weldable in-line without disassembly, see maintenance manual for instructions
- Bi-directional

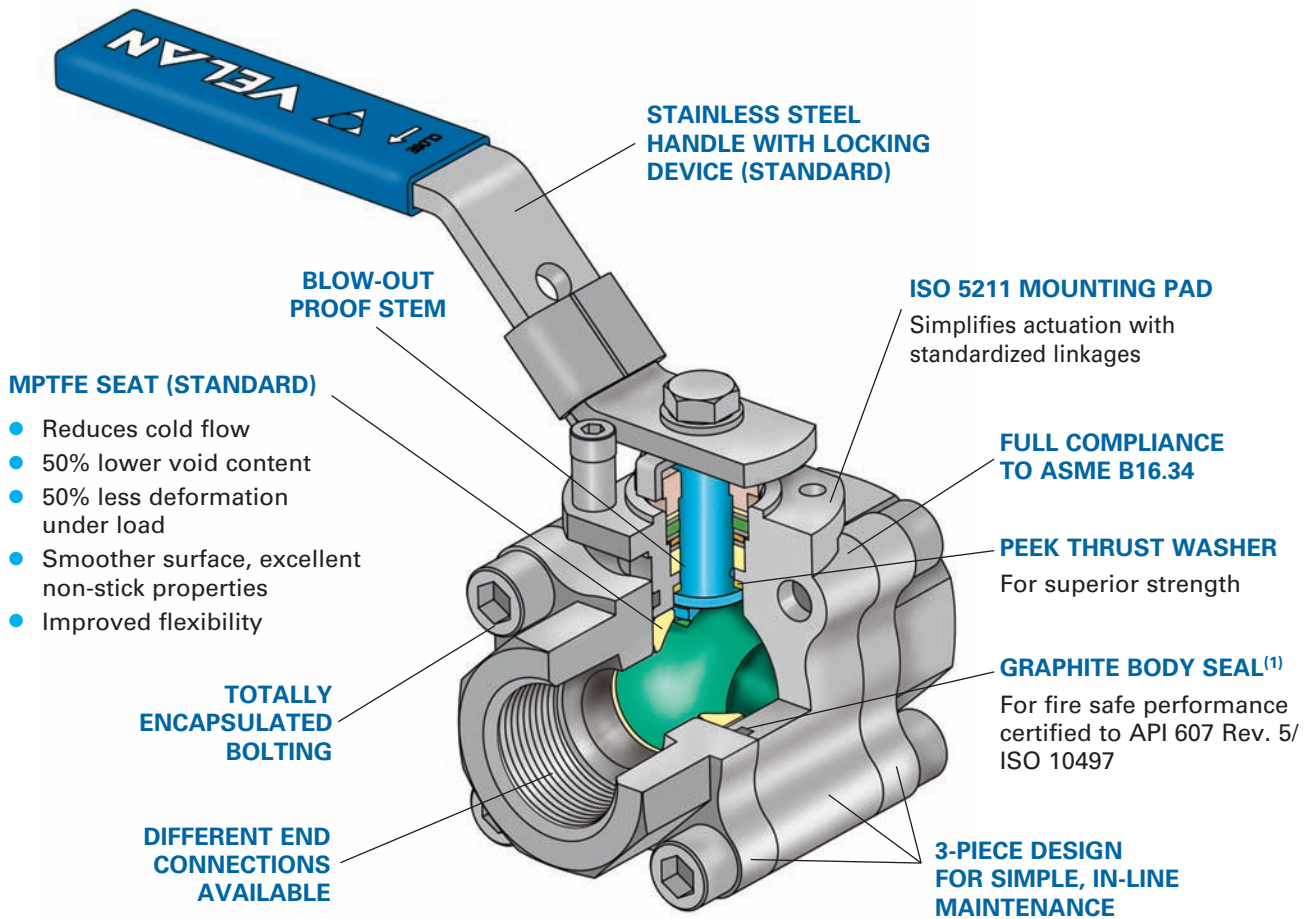
OPTIONS:

- Combination ends
- NACE (MRO 175)
- CE marking
- Oval locking handle



NOTE: 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 designs, materials or specifications without notice. Velan does not accept any liability or damages arising from the use of information in this catalog.

VTP-2000 DESIGN FEATURES

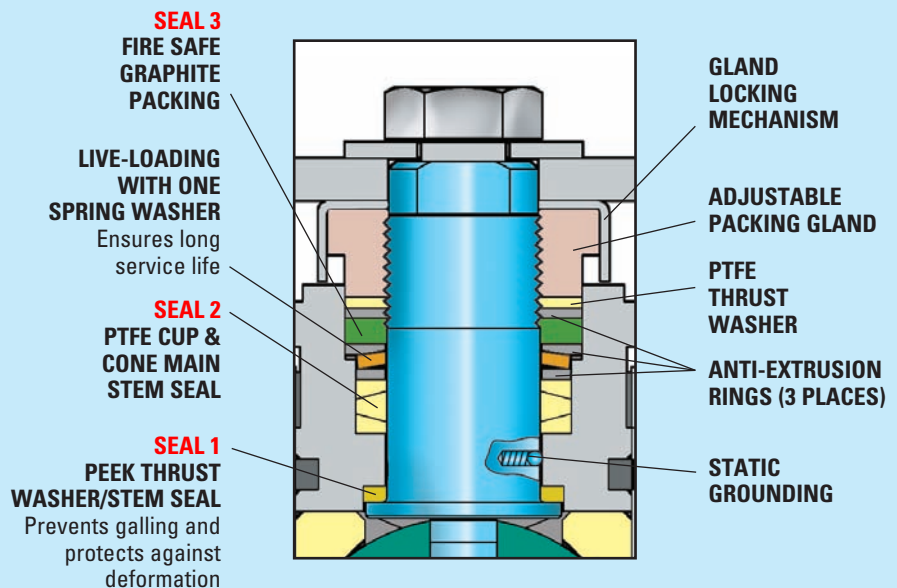


(1) PTFE body seal is also available for non-fire safe applications.

LIVE-LOADED ADJUSTABLE 3-WAY STEM SEAL

In order to achieve the required stem packing capability and performance within the limited space in these smaller valves, an impressive and **unique 3-way sealing system** has been developed which provides:

- Live-loaded cup & cone PTFE seal
- Primary PEEK seal
- Independently loaded fire safe graphite packing

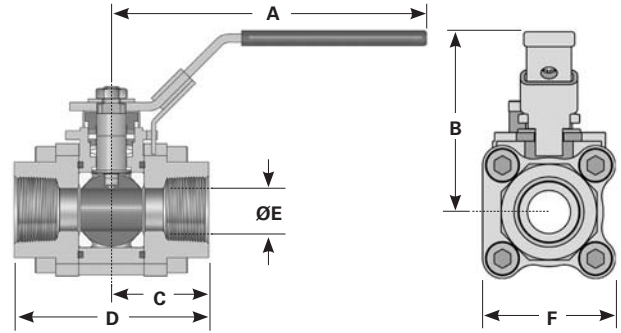


VTP-2000 REGULAR PORT TECHNICAL DATA

STANDARD MATERIALS

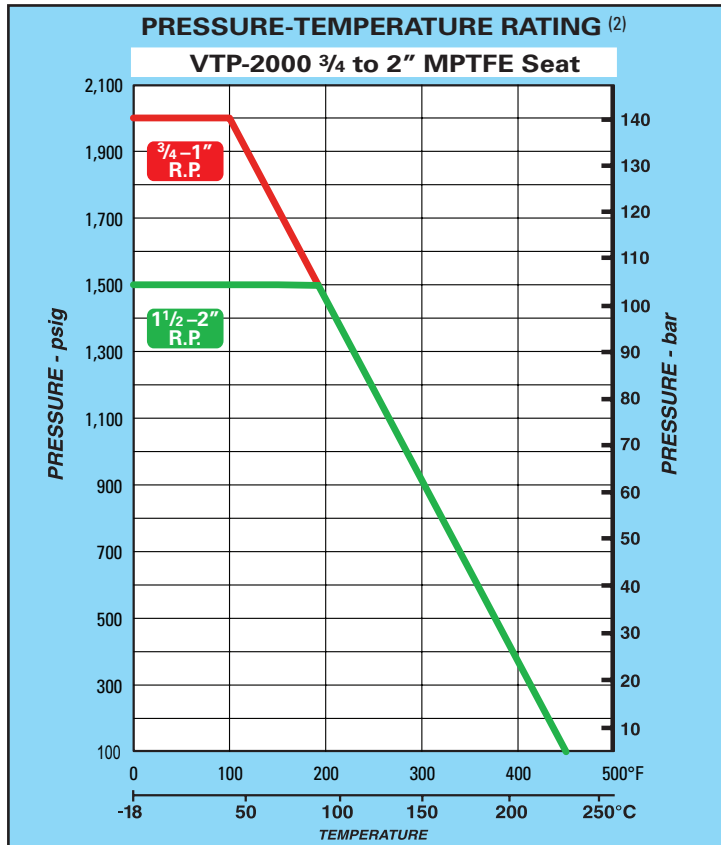
PART	CARBON STEEL	STAINLESS STEEL
Body	WCB	CF8M
Body end cap	WCB	CF8M
Stem		316
Ball		CF8M
Thrust washer		PEEK
Seat		MPTFE
Packing rings	Die-Formed Flexible graphite/PTFE	
Hex socket head cap screw	B7M	Gr. B8 Cl.1 ⁽¹⁾
Body seal	Die-formed flexible graphite or PTFE	
Locking device		304
Handle		304
Belleville washer		304
Spacer		304
Hex head cap screw		304
Washer		304
Packing nut		304
Packing washer		316

(1) Velan reserves the right to use UNS S30433 per ASTM F837.

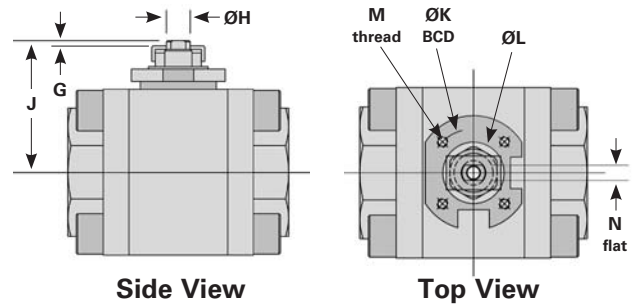


REGULAR PORT DIMENSIONS, CVs & WEIGHTS

SIZE in/mm	Dimensions						CV KV	WEIGHT lb/kg
	A	B	C	D	ØE	F		
¾ 20	5.18	3.01	1.49	2.97	0.62	2.17	15	2.7
	132	76	38	75	15.7	55	13	1.2
1 25	5.97	3.56	1.84	3.68	0.81	2.40	42	4.2
	152	90	47	93	20.6	61	36	1.9
1½ 40	7.94	4.62	2.26	4.52	1.25	3.43	125	9.9
	202	117	57	115	31.8	87	106	4.5
2 50	7.94	4.85	2.55	5.10	1.50	3.82	125	12.9
	202	123	65	130	38.1	97	106	5.9



(2) Pressure-Temperature shown is for CF8M or WCB body material. For rating of other materials please contact Velan.



REGULAR PORT STANDARD DIMENSIONS AUTOMATION

SIZE in/mm	ISO mtg. flange	Dimensions						
		G	ØH	J	ØK BCD	ØL	M thread	N flat
¾ 20	F03	0.22	0.394	1.83	1.417	0.983	M5	0.276
		5.6	10.0	46.5	36.0	25.0		
1 25	F04	0.42	0.551	2.35	1.654	1.180	M5	0.433
		10.7	14.0	59.7	42.0	30.0		
1½ 40	F05	0.42	0.551	3.06	1.969	1.377	M6	0.433
		10.7	14.0	77.7	50.0	35.0		
2 50	F05	0.42	0.551	3.28	1.969	1.377	M6	0.433
		10.7	14.0	83.3	50.0	35.0		

PRESSURE-TEMPERATURE RATING TABLE

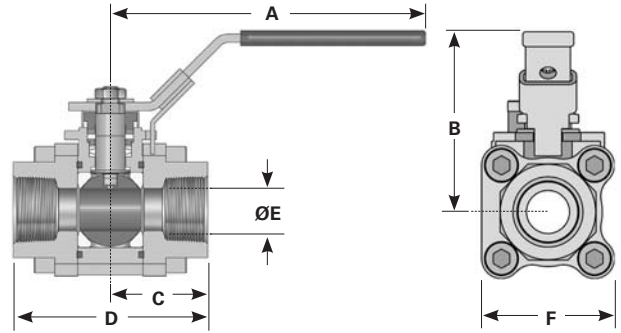
Size in/mm	psig - °F										bar - °C												
	0	50	100	150	192.5	200	250	300	350	400	450	-18	10	38	65	89	93	121	149	176	204	232	
¾-1"	15-25	2000	2000	2000	1729	1498	1457	1186	914	643	371	100	138	138	138	119	103	100	82	63	44	26	7
1½-2"	40-50	1500	1500	1500	1500	1498	1457	1186	914	643	371	100	103	103	103	103	100	82	63	44	26	7	

VTP-2000 FULL PORT TECHNICAL DATA

STANDARD MATERIALS

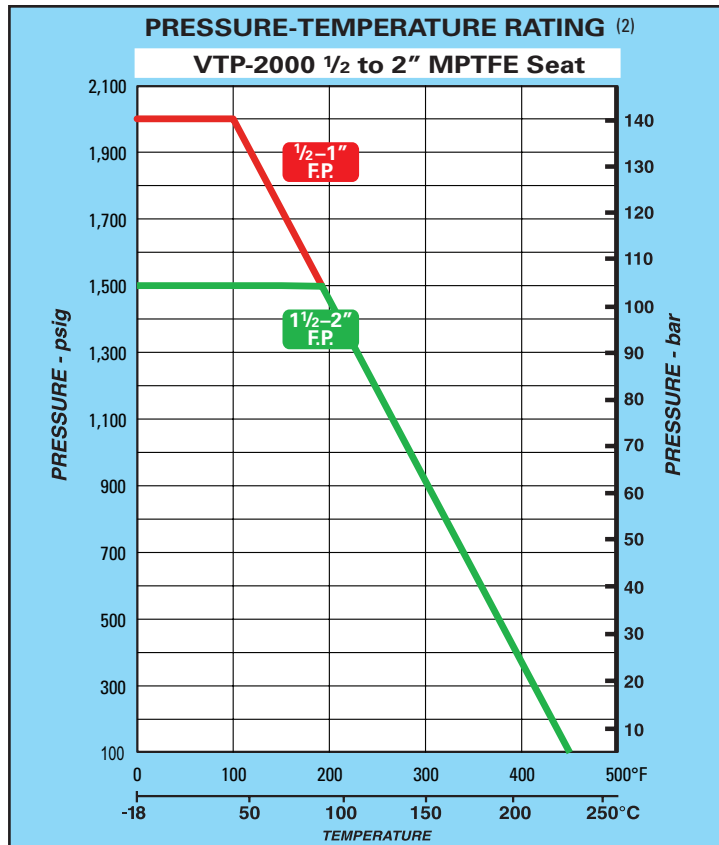
PART	CARBON STEEL	STAINLESS STEEL
Body	WCB	CF8M
Body end cap	WCB	CF8M
Stem	316	
Ball	CF8M	
Thrust washer	PEEK	
Seat	MPTFE	
Packing rings	Die-Formed Flexible graphite/PTFE	
Hex socket head cap screw	B7M	Gr. B8 Cl.1 ⁽¹⁾
Body seal	Die-formed flexible graphite or PTFE	
Locking device	304	
Handle	304	
Belleville washer	304	
Spacer	304	
Hex head cap screw	304	
Washer	304	
Packing nut	304	
Packing washer	316	

(1) Velan reserves the right to use UNS S30433 per ASTM F837.

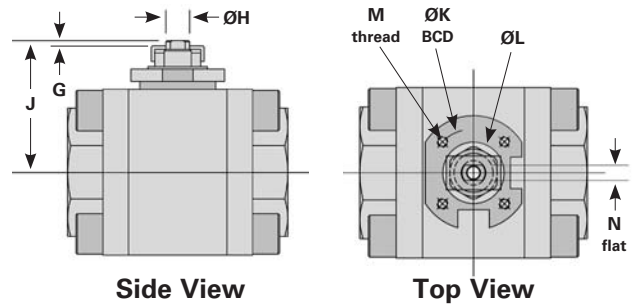


FULL PORT DIMENSIONS, CVs & WEIGHTS

SIZE in/mm	Dimensions						CV KV	WEIGHT lb/kg
	A	B	C	D	ØE	F		
½ 15	5.18 132	2.85 72	1.32 34	2.64 67	0.50 12.7	2.00 51	9 8	2.2 1.0
¾ 20	5.97 152	3.56 90	1.84 47	3.68 93	0.81 20.6	2.40 61	50 43	4.3 2.0
1 25	5.97 152	3.88 99	2.08 53	4.16 106	1.00 25.4	3.03 77	100 85	6.9 3.1
1½ 40	7.94 202	4.85 123	2.47 63	4.94 125	1.50 38.1	3.82 97	250 213	13.5 6.1
2 50	11.90 302	5.31 135	2.93 74	5.86 149	2.00 50.8	6.24 158	430 366	25.2 11.4



(2) Pressure-Temperature shown is for CF8M or WCB body material. For rating of other materials please contact Velan.



FULL PORT STANDARD DIMENSIONS AUTOMATION

SIZE in/mm	ISO mtg. flange	Dimensions						
		G	ØH	J	ØK BCD	ØL	M thread	N flat
½ 15	F03	0.21 5.3	0.394 10.0	1.66 42.2	1.417 36.0	0.983 25.0	M5	0.276 7.0
¾ 20	F04	0.42 10.7	0.551 14.0	2.35 59.7	1.654 42.0	1.180 30.0	M5	0.433 11.0
1 25	F04	0.42 10.7	0.551 14.0	2.67 67.8	1.654 42.0	1.180 30.0	M5	0.433 11.0
1½ 40	F05	0.42 10.7	0.551 14.0	3.28 83.3	1.969 50.0	1.377 35.0	M6	0.433 11.0
2 50	F07	0.67 17.0	0.866 22.0	4.48 113.8	2.756 70.0	2.164 55.0	M8	0.669 17.0

PRESSURE-TEMPERATURE RATING TABLE

Size in/mm	psig - °F										bar - °C												
	0	50	100	150	192.5	200	250	300	350	400	450	-18	10	38	65	89	93	121	149	176	204	232	
½-1"	15-25	2000	2000	2000	1729	1498	1457	1186	914	643	371	100	138	138	138	119	103	100	82	63	44	26	7
1½-2"	40-50	1500	1500	1500	1500	1498	1457	1186	914	643	371	100	103	103	103	103	100	82	63	44	26	7	

VTP-2000 ACTUATOR SIZING

TYPICAL EXAMPLES

FOR SIZING ACTUATORS BASED ON ACTUATOR TORQUING EQUATION

TO OBTAIN THE TORQUE REQUIREMENTS FOR A GIVEN ACTUATOR

STEP 1 Determine the basic, maximum torque "TT" for a particular valve and pressure differential from the Table 4, the torque tables on page 7.

STEP 2 Determine from Table 3 the seat material factor "MF". For PTFE or RPTFE, the factor is 1.0.

STEP 3 Determine from Table 1 the fluid factor "FF"

STEP 4 Determine from Table 2 the frequency of operation factor "OF"

STEP 5 Using the data from steps 1–4, the actuator torque equation "AT" can now be established:

$$AT = TT \times MF \times FF \times OF \text{ lbf}\cdot\text{in}$$

(STEP 1) (STEP 2) (STEP 3) (STEP 4)

EXAMPLE 1 Split-body flanged in CF8M, full port

Application: Liquid oxygen evaporizer.

Service: Clean, dry, oxygen gas.
Differential pressure 60 psid (4.1 bar).

Service temperature: 70°F (21°C).

Cycle time: Every 6 hours.

Valve size: SB-150 4" (100 mm).

Seat material: PTFE.

Actuator: Pneumatic actuator with spring return, fail closed.

Air supply: 90 psig (6.2 bar).

SIZING OF TORQUE:

TT = 2000 lbf·in (226 Nm) For $\Delta P = 60$ psid (4.1 bar),

MF = 1 (PTFE) (Table 3),

FF = 1.3 (Table 1), OF = 1 (Table 2)

Minimum break torque required

$$AT = 2000 (226 \text{ Nm}) \times 1 \times 1.3 \times 1 = 2600 \text{ lbf}\cdot\text{in} (294 \text{ Nm})$$

ACTUATOR TORQUE REQUIREMENT CALCULATIONS

IMPORTANT NOTES

1. Published factors are to be used as a guide.
2. The actuator selection has to be based also on economic considerations. A valve that has an important function, or one that is out of reach for service, should have a larger actuator than would normally be selected.

TABLE 1 FLUID FACTOR "FF"

LIQUID	FACTOR "FF" ⁽¹⁾
Clean particle-free, non-lubricating (e.g.: water, alcohol or solvents)	1.0
Clean particle-free, lubricating oil	0.5 to 0.8
Slurry (liquids carrying solids) or heavy corroded and contaminated system	1.3 to 2.0
Gas or saturated steam, clean and wet	1.0
Gas or superheated steam, clean and dry	1.3
Gas, dirty (e.g.: natural gas)	1.2 to 1.5

TABLE 2 FREQUENCY OF OPERATION FACTOR "OF"

FREQUENCY	FACTOR "OF" ⁽¹⁾
Once per day or greater	1.0
Once per week or greater	1.3
Once per month or greater	1.4
Once per four months or greater	1.5

TABLE 3 SEAT FACTOR "MF" AND SEAT MATERIAL SELECTION

SEAT FACTOR MF ⁽¹⁾	SEAT MATERIAL	APPLICATION AND LIMITATIONS				
		RANGE (°F/°C)	CHEMICAL	RADIATION	TYPE OF VALVE	SERVICE APPLICATION
E 1.0	Modified polytetrafluoroethylene (MPTFE)	-100 to 450 -73 to 232	All except: - Molten alkali metals - Liquid or gaseous fluorine - A few fluoro-chemicals (i.e., ClF ₃ and OF ₂ ...).	10 ⁴ RAD	VTP-2000	For low and medium pressure service. Particularly recommended for use on styrene and butadiene

1) The seat, fluid, and frequency of operation factors should be considered as a guide only and should be adjusted according to experience and judgment. Velan is not responsible directly or indirectly for actuator selection by third parties.

VTP-2000 TORQUE VALUES

With a low torque design, and ISO 5211 mounting pad, the Velan VTP-2000 is simple and economical to actuate. This torque chart provides data for valves with clean fluids, and are to be used as a guide only. Type of media, cycle frequency and seat may all affect the actual operating torque of the valve.



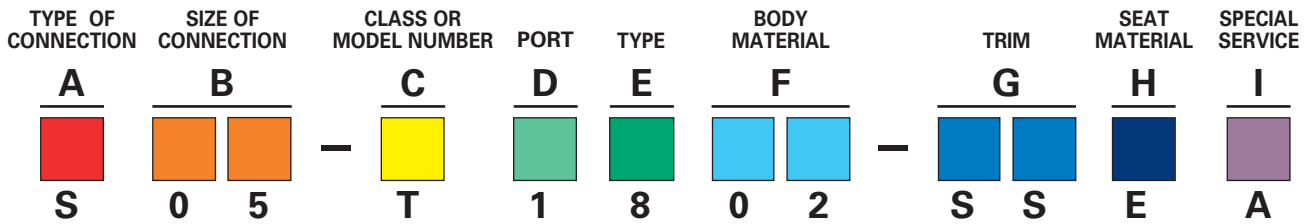
TABLE 4
REGULAR & FULL PORT TORQUE TABLES lb-in/Nm "TT"

Size in/mm		Maximum differential pressure psi/bar				
Regular port	Full port	0	500 35	1000 69	1500 103	2000 138
½" 15	—	40 5	40 5	40 5	40 5	40 5
¾" 20	—	70 8	70 8	70 8	70 8	70 8
1" 25	¾" 20	80 9	80 9	80 9	90 10	100 11
—	1" 25	100 11	100 11	150 17	200 23	250 28
1½" 40	—	170 19	213 24	257 29	300 34	—
2" 50	1½" 40	230 26	322 36	415 47	508 57	—
—	2" 50	350 40	550 62	875 99	1200 136	—

HOW TO ORDER

VELAN VTP-2000 3-PIECE BALL VALVES

The figure numbers shown on this key cover essential features of Velan Valvac valves. Please use these figure numbers to ensure prompt and accurate processing of your order.



Example: 1", threaded, VPT-2000, full port valve in carbon steel body with stainless steel trim, and MPTFE seats for standard service.

A	TYPE OF CONNECTION	
C - Butt weld S - Threaded W - Socket weld		
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.		
EXAMPLES:		
S05-T1802-SSEA (valve size is part of figure number)		
1"S-T1802-SSEA (valve size is shown separately)		
03 - ½" (15 mm)	05 - 1" (25 mm)	08 - 2" (50 mm)
04 - ¾" (20 mm)	07 - 1½" (40 mm)	
C	MODEL NUMBER	
T - VTP-2000		

D	PORT	
0 - Regular 1 - Full port		
E	TYPE	
8 - Three-Piece valve (bolted)		
F	BODY MATERIAL	
02 - WCB 13 - STAINLESS STEEL CF8M		
G	TRIM	
CODE	BALL	STEM
SS	316	316
H	SEAT MATERIAL	
E - MPTFE		
I	SPECIAL SERVICE	
A - Standard I - NACE Z - FIRE-TESTED TP API 607 REV. 5/ISO 10497		

