

HOW TO AVOID PROBLEMS

- Ball valves should be transported and stored with the ball in the fully open or fully closed position.
- Flanged ends and welded ends should be protected.
- End protection should be removed only when the valve is installed in the line.
- Valves should be handled using the proper lifting lugs.
- Valves should be stored according to Velan storage procedures. Long term storage should be avoided.
- For welded-end valves, advise Velan if there will be a post-weld heat treatment (transition pups may be necessary to avoid damages to seals).
- Flush and clean the line before opening/closing the valve.
- Make sure no line-testing fluid is left in the line and/or the valve body.
- Avoid leaving the valve body filled with salt water to prevent internal corrosion.
- During line-testing, valves should be left in the partially open position for the minimum possible amount of time.
- Standard ball valves should be used for on-off service only. Throttling service (use of the valve with the ball partially open) can damage the seats.
- Make sure to take into consideration the actual service conditions when selecting materials for O-rings and seat inserts.
- Always specify anti-explosive decompression material for valves to be used in high pressure gas service.
- Make sure the selected actuator has been properly sized (an oversized actuator can be as dangerous as an undersized one).
- Advise Velan of cycle frequency to ensure proper sizing of actuator.
- Do not use the actuator to lift the valve.



Velan Side-Entry Bolted Body Trunnion-Mounted Ball Valves destined for offshore service.

MATERIALS

BODY & TRIM MATERIAL

CARBON STEEL

A105N A216 WCB A216 WCC

LOW TEMPERATURE CARBON STEEL

A350 LF2 A352 LCB A352 LCC

LOW ALLOY STEEL

AISI 4140 A694 F65 A694 F52
A694 F60 A350 LF3
API 6A 60K (A694 F60 Mod)

MARTENSITIC STAINLESS STEEL

A182 F6A A182 F6NM
A217 CA15 A487 CA6NM

AUSTENITIC STAINLESS STEEL

A182 F316 A182 F316L
A182 F316LN-Mod. A182 F347
A182 F44 (6% Mo) A182 FXM-19
(UNS S31254) (Nitronic 50)
A351 CF8M A351 CF3
A351 CF3M

PRECIPITATION HARDENING STAINLESS STEEL

A564 Gr 630 H1150M (UNS S17400)

DUPLEX STAINLESS STEEL

A181 F51 (UNS S31803)
A182 F53 (UNS S31750)
A182 F55 (UNS S31760)
A890-4A (UNS S31803)
A890-6A (UNS S32760)

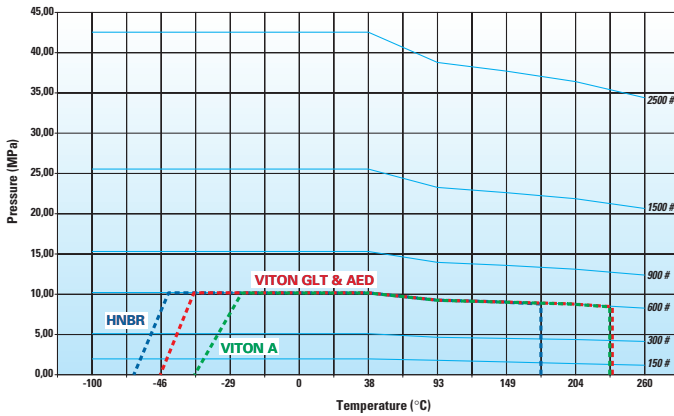
NICKEL ALLOYS

Incoloy 825 (UNS N08825) Incoloy 925 (UNS N09925)
Inconel 625 (UNS N06625) Inconel 718 (UNS N07718)
Inconel 750 (UNS N07750)
Monel 400
Monel K500

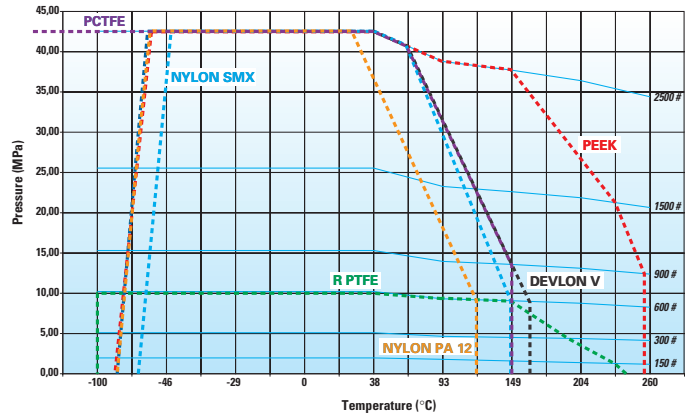
SEAT INSERT & SEALS MATERIALS OPERATING (DYNAMIC) LIMITS

MATERIAL	TEMP. °C		PRESSURE CLASS		SIZE	
	MIN.	MAX.	SEAT INSERT	SEAL	SEAT INSERT	SEAL
Nylon SMX	-40	120	2500	N/A	64"	N/A
Lauramid (Nylon 12G)	-60	100	2500	N/A	64"	N/A
Devlon (Nylon 6)	-60	140	2500	N/A	64"	N/A
PeeK	-60	220	2500	N/A	36"	N/A
PTFE Glass Filled (25%)	-100	200	600	N/A	24"	N/A
PTEFE Carbon Filled (25%)	-100	180	300	N/A	24"	N/A
PCTFE	-196	150	2500	N/A	36"	N/A
HNBR-Therban	-40	150	900	2500	64"	N/A
FKM A (Viton A)	-29	180	900	2500	64"	64"
FKM GLT (Viton GLT)	-40	180	900	2500	64"	64"
FKM AED	-29	180	900	2500	64"	64"
PTFE + Elgiloy Springs	-196	200	N/A	2500	N/A	36"

SEAT INSERTS – STATIC/SHORT PERIOD

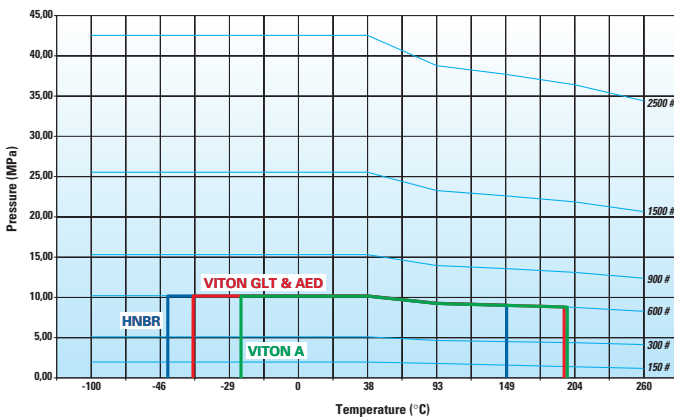


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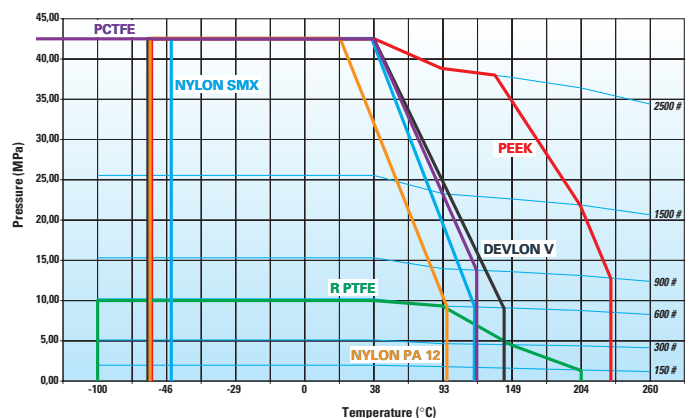


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SEAT INSERTS – OPERATING CONDITION



(ELASTOMERS)



(PLASTIC)

C_v FLOW COEFFICIENTS

API 6D

BORE (INCHES)	CLASSES					
	150	300	600	900	1500	2500
2	420	420	400	330	330	250
2½	690	690	610	520	510	320
3 × 2	200	200	200	190	180	200
3	1200	1050	1000	910	820	500
4 × 3	600	600	600	590	550	560
4	2200	2100	1850	1800	1700	1100
6 × 4	800	800	790	790	780	745
6	5150	5100	4600	4380	3800	2500
8 × 6	2150	2150	2150	2150	2150	2150
8	9500	9400	9000	8500	7400	5300
10 × 8	4300	4300	4300	4450	4450	4100
10	15000	15000	14700	14500	11500	8300
12 × 10	7550	7550	7550	8000	9000	7550
14 × 10	6000	6000	6000	6100	6100	-
12	23000	23000	22500	21100	18000	13000
14 × 12	14000	14000	14000	12800	13000	-
16 × 12	9100	9100	9100	8900	8900	-
14	28000	28000	28000	25000	21000	-
16 × 14	15000	15000	15000	14200	14100	-
16	37200	37200	37200	34500	27500	-
18 × 16	21000	21000	21000	19200	19000	-
20 × 16	15300	15300	15300	13800	12000	-
18	49000	49000	49000	45000	37000	-
20 × 18	28400	28400	28400	25000	25000	-
20	59000	59000	59000	55200	47800	-
24 × 20	28200	28200	28000	25100	20600	-
22	68200	68200	68200	62000	54000	-
24	92000	92000	92000	83800	70000	-
30 × 24	36000	36000	36000	32900	-	-
26	110000	110000	110000	98500	-	-
28	121000	121000	121000	113000	-	-
30	145000	144000	144000	130000	-	-
36 × 30	64000	64000	64000	61500	-	-
32	170000	170000	170000	151000	-	-
36 × 32	87000	87000	87000	69500	-	-
36	210000	210000	210000	198200	-	-
40	267500	267500	267500	-	-	-
42 × 36	96700	96700	96000	-	-	-
42	280000	280000	280000	-	-	-
48	384000	384000	384000	-	-	-
56 × 42	89000	89000	89000	-	-	-
56	521000	521000	521000	-	-	-

API 6A

BORE (INCHES)	CLASSES		
	3000	5000	10000
1 13/16	270	270	230
2 1/16	350	350	300
3 1/8	1000	940	890
4 1/16	1750	1700	1600
5 1/8	2900	2700	2450
7 1/16	5930	5400	5220

DATA FOR CALCULATION OF FLOW

The coefficient of flow C_v expresses the rate of flow in gallons per minute at 60°F water with a pressure drop of 1 psig across the valve. The C_v coefficients for the various types and sizes, shown in the tables, have been determined from actual flow tests.

NOTE: K_v is the metric equivalent of C_v.

$$K_v = C_v \times 0.85$$

FOR LIQUIDS:

$$(1) \quad Q_L = C_v \sqrt{\frac{\Delta P}{G_L}}$$

$$(2) \quad \Delta P = G_L \left(\frac{Q_L}{C_v} \right)^2$$

WHERE: Q_L = Flow in U.S. gallons per minute.
 ΔP = (P₁-P₂) Pressure drop in psi
 G_L = Specific gravity of liquid (water = 1 at 60°F)

FOR GASES:

$$(3) \quad Q_g = 1360 C_v \sqrt{\frac{\Delta P}{G_g T}} \cdot \sqrt{\frac{P_1 + P_2}{2}}$$

$$(4) \quad \Delta P = P_1 - \sqrt{P_1^2 - 2G_g T \left(\frac{Q_g}{1360 C_v} \right)^2}$$

WHERE: Q_g = Volumetric flow of gas (SCFH)
 G_g = Specific gravity of gas at standard conditions
 (air at atmosphere and 60°F = 1)
 T = Absolute temperature of gas (°F + 460)

NOTE: For gas, max. ΔP = 1/2 P₁, and min.
 P₂ = 1/2 P₁, and P₁, P₂ are absolute pressures (psia)