

# PLUG VALVE



## VALVE SOLUTIONS for Corrosive Applications



AUTHORISED DISTRIBUTOR FOR  
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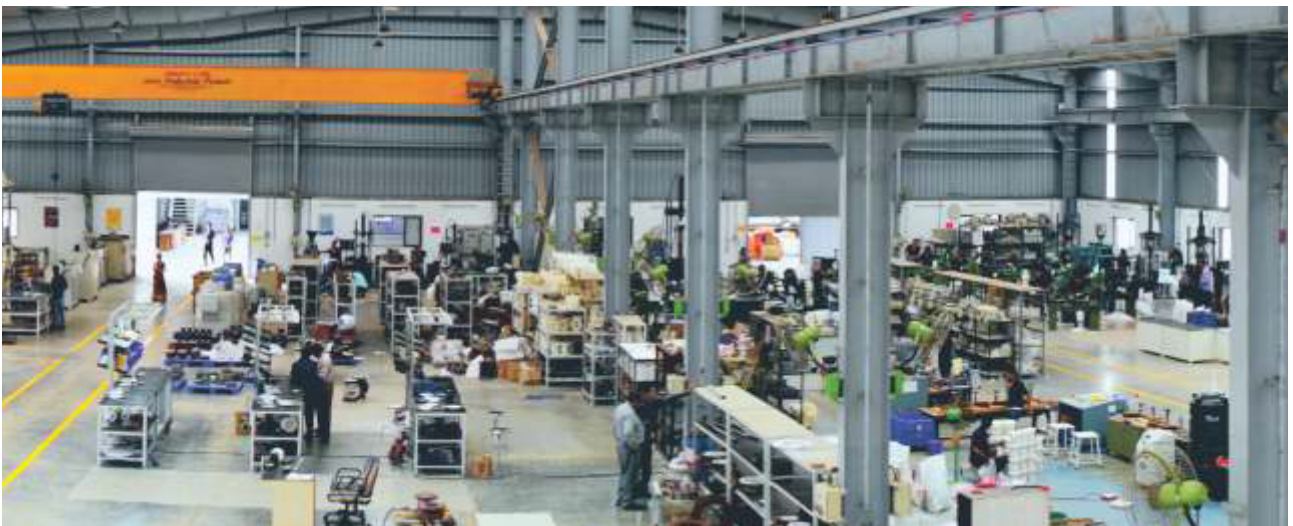


**UNP Polyvalves**

Manufacturer of PFA/FEP/PTFE Lined & Plastic Valves,  
Pipes & Pipe Fittings



# VALVE SOLUTIONS for Corrosive Applications



## About Us

UNP Polyvalves is manufacturing Corrosive application valves since 1988.

UNP started with all plastic valves with limited size options, today has a complete range of corrosive application valves in both options of Solid Plastic valves and Lined valves. UNP now has in it's range Ball, Plug, Butterfly, Diaphragm valves, Non-return valves, Strainers, Sampling valves, Pipes and Pipe Fittings. This completes range of complete piping solution in corrosive applications.

UNP has most modern facility situated at Por with latest moulding technology and highest moulding capacity to manufacture lined valves as large as 24" with Injection moulding machines of largest capacity in the country.

Envisioned for quality and reliability, UNP Polyvalves aims for highest level of Customer satisfaction through its solutions with the commitment for excellence in all spheres of business.

UNP Polyvalves possesses live skill sets headed by highly knowledgeable, technically

experienced entrepreneurs. These experts lead and guide their team with a great vision to achieve high quality standards to make products for its high performance and unmatched quality.

UNP Polyvalves, over all these years has been dealing with almost all chemical process industries in Chlor Alkali, Chemical, Pharmaceutical, Mining, Refineries etc., in India and exporting to 35+ countries in the world including market such as USA, Europe, Latin America, Africa, Russia, South East Asia, Australia etc. . .

## Achievements

UNP Polyvalves through its technical expertise and involvement in knowing Physical process parameters could help resolving corrosion problems related to valves and piping system in Industries such as Chlor Alkali, CRM in Steel Industries, Chemical injection skids for Oil and Gas and many more chemical plant across the world. UNP today has approvals from leading consultants such as UHDE, Jacobs Engineering, Mott McDonald, Toyo Engineering, Fluor Daniel, TUV, EIL etc., and have worked for their prestigious projects.

## PRODUCT FEATURES AND OPTIONS AVAILABLE

- UNP has a unique design Plug valves specifically to provide very low torque against PFA Lined Plugs available as standard worldwide.
- UNP offers following lining options instead of standard PFA or FEP Lined Plugs to achieve very low torques. Which is shown in table Below.

[a] TEFCOR  
[b] TFM  
[c] GTEFCOR  
[d] CERCOR

SIZE	TORQUE FOR PFA PLUGS OF UNP		TORQUE FOR TEFCOR /GTEFCOR /TFM & CERCOR PLUGS OF UNP	
	N-M	INCH - POUND	N-M	INCH - POUND
0.5"	30	260	-	-
1"	35	310	-	-
1.5"	50	443	30	266
2"	75	664	40	354
3"	140	1239	50	443
4"	235	2080	100	885
6"	525	4646	238	2100

UNP has GTEFCOR and CERCOR Plug Options for abrasive applications and these options will help against Conventional Plug Lining options of PFA or FEP which may wear out in abrasive applications.

BODY LINING OPTIONS	BODY AND PLUG CASTING OPTIONS
PFA	ASTM A 216 GR. WCB
FEP	ASTM A 351 GR. CF8
PVDF	ASTM A 351 GR. CF8M
ETFE	ASTM A 890 GR. 4A (CD3MN)
ECTFE	HASTELLOY C 276 / C 22
PPH	MONEL



# PFA LINED PLUG VALVES

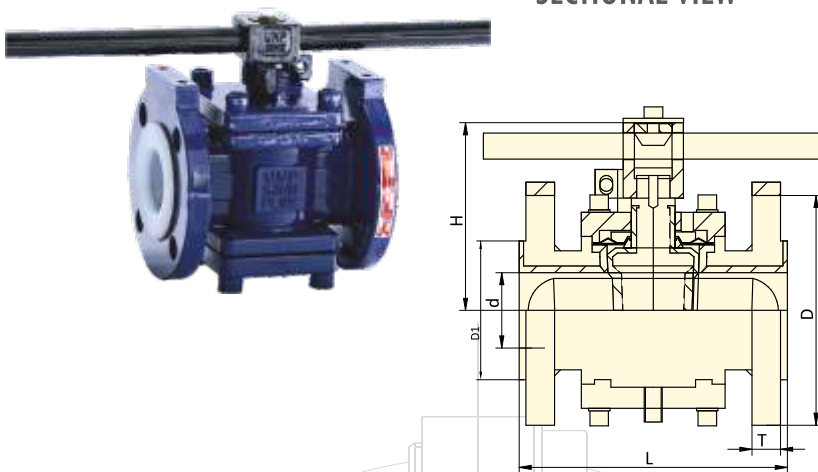
## LEVER OPERATED

### PART LIST

PART NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB + PFA LINED	1
2	Plug	ASTM A 890 GR. 4A(CD3MN) + PFA or TEFCOR LINED	1
3	Cover Plates	ASTM A 216 GR. WCB	2
4	Shim Bottom	SS 304	1
5	Diaphragm Bottom	PTFE	1
6	Wedge Ring	PTFE	1
7	Diaphragm Top	PTFE	1
8	Shim Top	SS 304	1
9	Thrust Collar	SS 304	1
10	Grub Screw Bottom	SS 304	1
11	Allen Bolt Washer Bottom	SS 304	4
12	Allen Bolt Bottom	ASTM A 193 GR. B7	4
13	Grub Screw Top	SS 304	3
14	Allen Bolt Washer Top	SS 304	4
15	Allen Bolt Top	ASTM A 193 GR. B7	4
16	LEVER	MS	1
17	Wrench Holding Block	ASTM A 216 GR. WCB	1
18	Wrench Bolt Washer	STEEL	1
19	Wrench Holding Bolt	SS 304	1



### SECTIONAL VIEW



### DIMENSIONS

Size	L ±0.11		D ±0.04		D1 ±0.04		d ±0.04		T ±0.11/0.00		H ±0.19		PCD ±0.062		n	HOLE DIA.	
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM		INCH	MM
0.5"	4.25	108	3.50	89	1.38	35	0.59	15	0.51	13	3.46	88	2.36	60	04	5/8	16
1"	5.00	127	4.25	108	2.00	51	0.98	25	0.63	16	4.17	106	3.11	79	04	5/8	16
1.5"	6.50	165	5.00	127	2.87	73	1.5	39	0.74	19	4.29	109	3.86	98	04	5/8	16
2"	7.01	178	5.98	152	3.62	92	1.97	50	0.80	20.5	5.47	139	4.76	121	04	3/4	19
3"	7.99	203	7.48	190	5.00	127	2.95	75	0.98	25	5.78	147	5.98	152	04	3/4	19
4"	9.01	229	9.01	229	6.18	157	3.7	94	0.98	25	6.92	176	7.52	191	08	3/4	19

All Dimensions are in Inches & mm unless otherwise specified. PCD of the Valve can be provided in ANSI / DIN / JIS. Tolerances are given in Inches.

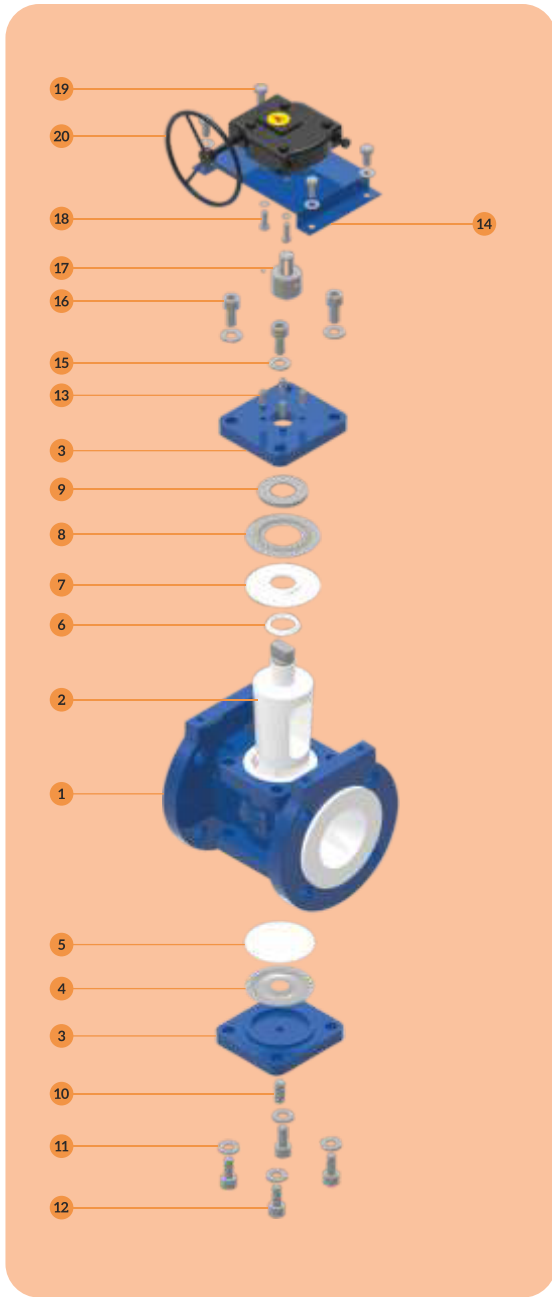




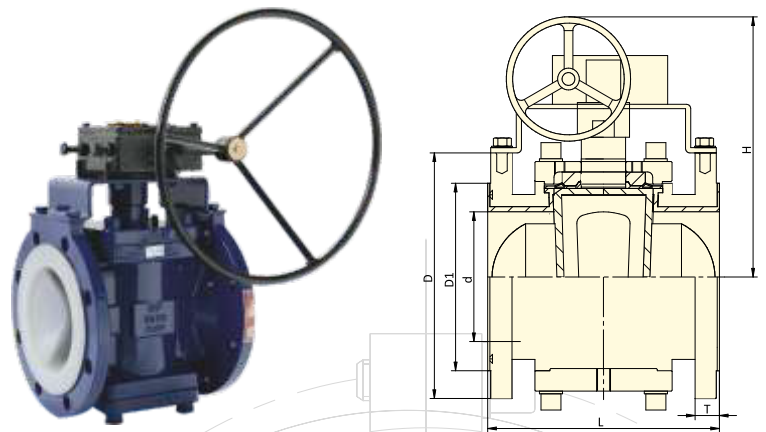
**PFA LINED PLUG VALVES**  
GEAR OPERATED

**PART LIST**

PART NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB + PFA LINED	1
2	Plug	ASTM A 890 GR. 4A(CD3MN) + PFA or TEFCOR LINED	1
3	Cover Plates	ASTM A 216 GR. WCB	2
4	Shim Bottom	SS 304	1
5	Diaphragm Bottom	PTFE	1
6	Wedge Ring	PTFE	1
7	Diaphragm Top	PTFE	1
8	Shim Top	SS 304	1
9	Thrust Collar	SS 304	1
10	Grub Screw Bottom	SS 304	1
11	Allen Bolt Washer Bottom	SS 304	4
12	Allen Bolt Bottom	ASTM A 193 GR. B7	4
13	Grub Screw Top	SS 304	3
14	Gear Box Mounting Bracket	SS 304	1
15	Allen Bolt Washer Top	SS 304	4
16	Allen Bolt Top	ASTMA A 193 GR. B7	4
17	Coupler	SS 304	1
18	Gear Box Mounting Bolts	HT 12.9	4
19	Bracket Mounting Bolts	HT 12.9	4
20	Gear Box	CAST IRON	1



**SECTIONAL VIEW**

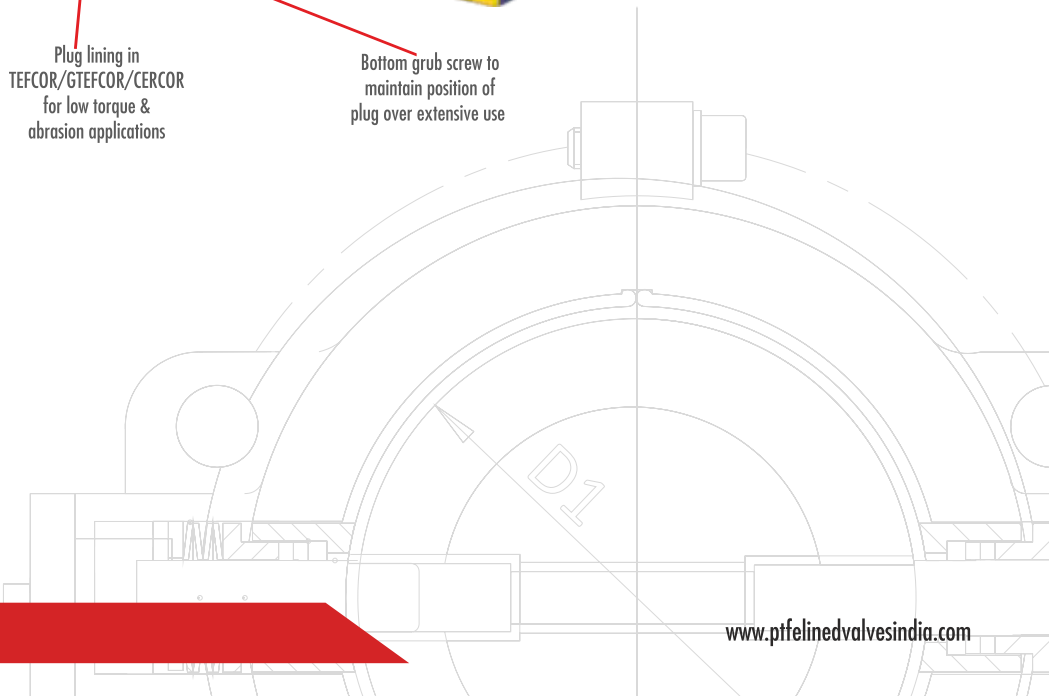
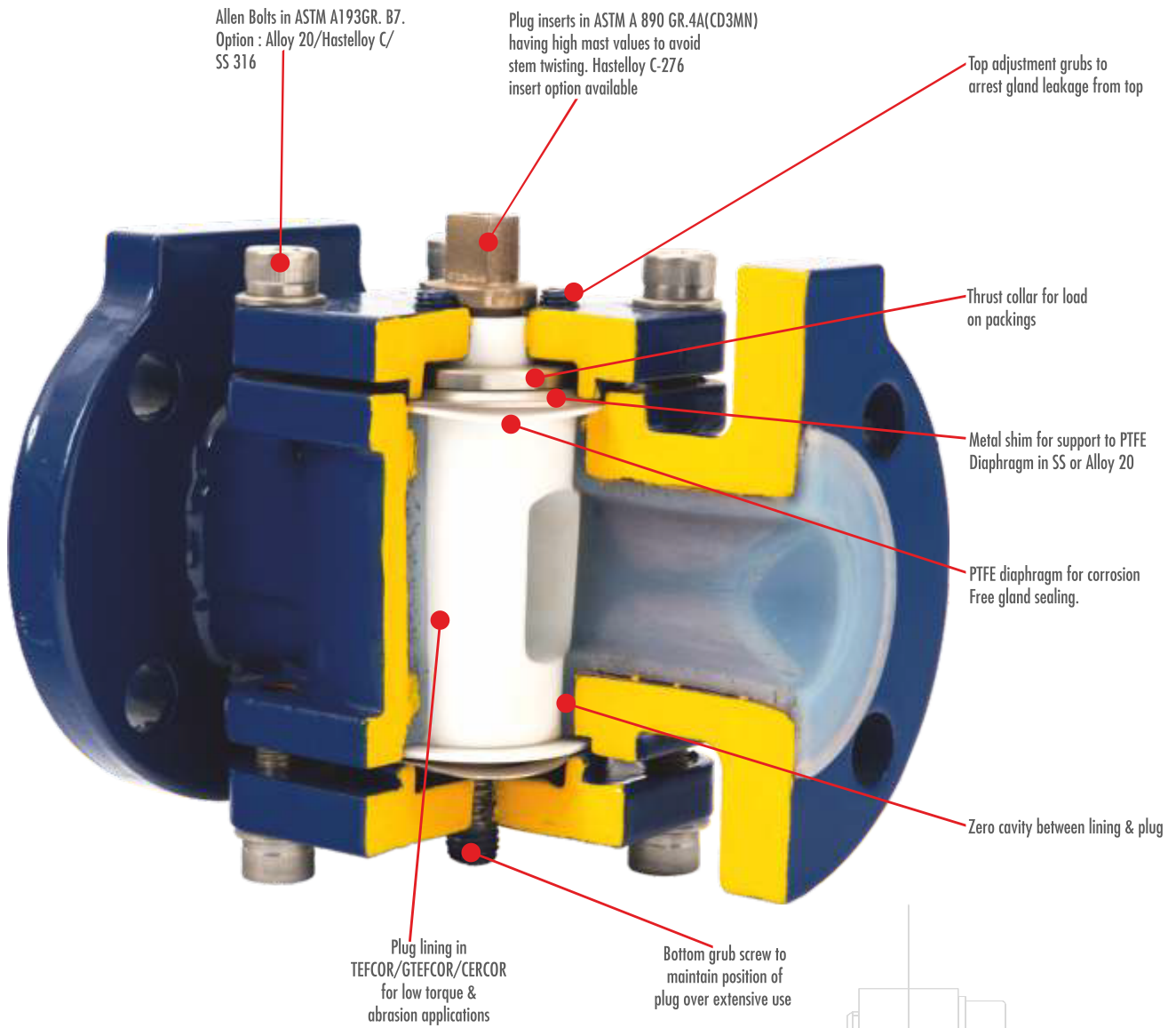


**DIMENSIONS**

Size	L ±0.11		D ±0.04		D1 ±0.04		d ±0.04		T ±0.11/0.00		H ±0.19		PCD ±0.062		n	HOLE DIA.	
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM		INCH	MM
6"	10.51	267	11.00	280	8.50	216	5.90	150	1.10	28	16.14	410	9.48	241	08	7/8	22
8"	11.69	297	13.50	343	10.55	268	7.60	194	1.18	30	18.30	465	11.73	298	08	7/8	22

All Dimensions are in Inches & mm unless otherwise specified. PCD of the Valve can be provided in ANSI / DIN / JIS. Tolerances are given in Inches.

# PLUG VALVE FEATURES





### TORQUE & Cv VALUES

SIZE	TORQUE IN NM		TORQUE IN INCH-LBS		Cv
	PFA PLUG	TEFCOR PLUG	PFA PLUG	TEFCOR PLUG	
0.5"	25	-	221	-	15
1"	35	-	310	-	41
1.5"	50	30	443	266	91
2"	75	40	664	354	169
3"	140	50	1239	443	297
4"	235	100	2080	885	539
6"	525	238	4646	2100	1123
8"	1300	-	11505	-	1591

### VALVE NET WEIGHTS

SIZE	WEIGHT	
	KGS	LBS
0.5"	4.10	9.0
1"	5.20	11.4
1.5"	8.00	17.6
2"	12.30	27.0
3"	19.50	42.9
4"	31.00	68.2
6"	58.00	127.6
8"	80.00	176.0

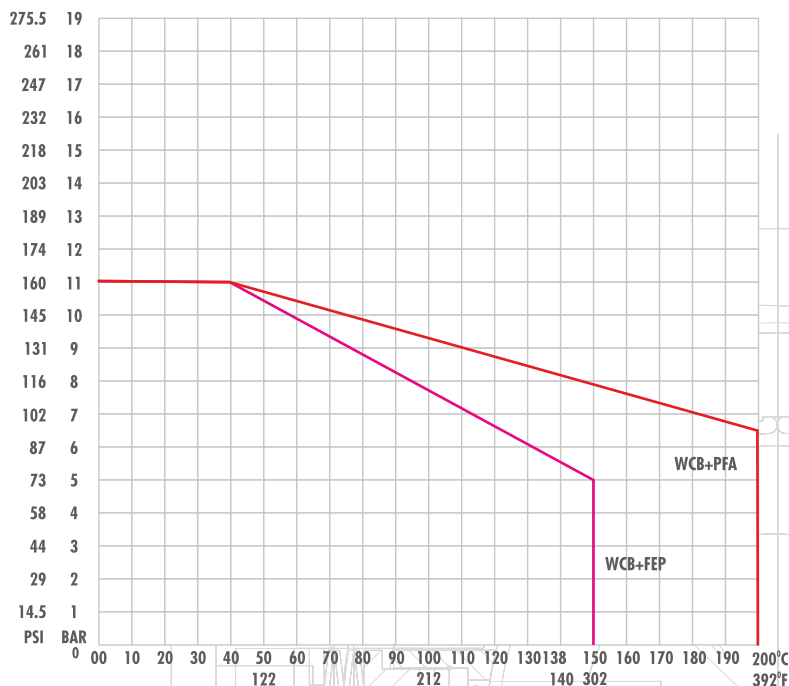
### PRODUCT DESIGN AND TESTS PERFORMED

DESIGN PARAMETERS	STANDARD
VALVE DESIGN	API 599
SHELL DESIGN	ANSI B 16.34
FACE TO FACE	ANSI B 16.10
FLANGE CONNECTION RATING	ANSI B 16.5, 150# / DIN PN 10 / JIS
TESTING STANDARD	BS EN 12266-1
CONNECTION	FLANGED, RF

TESTS PERFORMED SIZES	BS EN 12266-1 0.5" TO 4"		BS EN 12266-1 6" TO 8"	
	HIGH PR. SHELL TEST HYDRO	225 PSI	15 KG/SQ.CM	225 PSI
HIGH PR. SEAT TEST HYDRO	165 PSI	11 KG/SQ.CM	165 PSI	11 KG/SQ.CM
LOW PR. SEAT TEST PNEUMATIC	85 PSI	6 KG/SQ.CM	85 PSI	6 KG/SQ.CM

SPARK TEST	KVDC
SPARK TEST	20 KVDC

### PRESSURE - TEMPERATURE GRAPH





## CODE USED

TYPE OF VALVE	CODE
PLUG VALVE	PLGV

TYPE OF VALVE	CODE
ASTM A 216 GR. WCB	C1
ASTM A 351 GR. CF 8	C2
ASTM A 351 GR. CF8M	C3
ALLOY 20	C4
ASTM A 890 GR. 4A ( CD3MN )	C5
HASTELLOY C 276/22	C6

TRIM INSTERTS	CODE
ALLOY 20	T4
ASTM A 890 GR. 4A ( CD3MN )	T5
SUPER DUPLEX	T6
HASTELLOY C 276/22	TH

FASTENERS	CODE
SS 304	F2
SS 316	F3
HIGH TENSILE	F4
ASTM A 193 GR. B7	F5

OPERATION	CODE
LEVER	L
GEAR	G
BARE-STEM	B

LOCKING	CODE
PROVIDED	Y
NOT PROVIDED	N

LINING MATERIAL	CODE
PFA	L1
FEP	L2
ANTISTATIC PFA	L7

## CODE USED

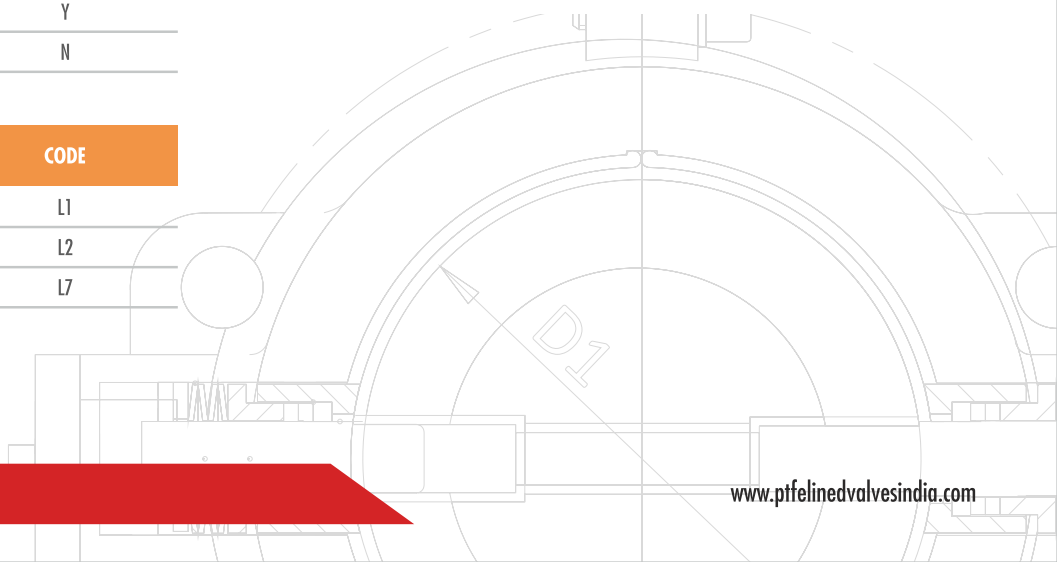
PLUG LINING MAT.	CODE
PFA	P1
FEP	P2
TEFCOR	P3
GTEFCOR	P4
TFM COR	P5
CERCOR	P6
ANTISTATIC PFA	P7

SEAT	CODE
NOT APPLICABLE	XX

SIZE							
0.5"	1"	1.5"	2"	3"	4"	6"	8"
CODE							
0H	01	1H	02	03	04	06	08

## HOW TO READ CODE

CODE	PLGVC1T5L1P3XXF5LY02	
VALVE TYPE	PLUG VALVE	PLGV
BODY CASTING	ASTM A 216 GR. WCB	C1
TRIM INSERT	DUPLEX	T5
BODY LINING	PFA	L1
PLUG LINING	TEFCOR	P3
SEAT	NO	XX
FASTNERS	ASTM A 193 GR.B7	F5
OPERATION	LEVER	L
LOCKING	PROVIDED	Y
SIZE	2"	02



## PLUG OPTIONS AVAILABLE

**TEFCOR PLUG**



**TFM PLUG**



**GTEFCOR PLUG**



**CERCOR PLUG**



RESIN STANDARD	TECHNICAL PROPERTIES	SPECIFIC GRAVITY	WATER ABSORPTION (%)	HARDNESS ROCKWELL (R)	TENSILE STRENGTH YIELD PSI	IMPACT STRENGTH NOTCHED FT . LB/IN	ELONGATION AT BREAK (%)	HDT °C	INJECTION MOULDING TEMP. °C	MAX WORKING TEMP. °C
ASTM D 3222	PVDF	1.77-1.78	0.03	76-80	7000	2.0-4.0	50-250	168	200-300	-40 to +140
ASTM D 3159	ETFE	1.70	0.007	75	6700	2.0	300	176	310-330	-100 to +160
ASTM D 2116	FEP	2.15	0.004	60	3400	2.9	325	260	350-370	205
ASTM D 3307	PFA	2.15	<0.03	72	3600	1.2	300	305	350-370	260

### TEFLON FEP “PER FLUORO (ETHYLENE PROPYLENE) COPOLYMER”

- FEP is a fluorocarbon resin having very strong interatomic bonds between Carbon & Fluorine atoms.
- It has very high molecular weight or long molecular chain length compared to other polymers.
- FEP can be used for continuous service temperature upto an elevated temperatures as high as 205 °C (400 °F).
- This fluorocarbon is resistant to all chemicals aggressive and hazardous in nature.
- Absorption rate of this fluorocarbon is as lower as 0.004%, hence swelling is avoided, and permeation is negligible.

### PFA (PER FLURO ALKOXY)

- PFA is also Fluorocarbon resin with all other properties same as FEP but can be used for Continuous service temperature up to an elevated temperature as high as 260 °C (500 °F)

## ETHYLENE TETRA FLUORO ETHYLENE (ETFE)

- It has very high temperature resistance from -100 °C to +160 °C.
- It is resistant to a wide variety of corrosive chemicals and organic solvents, including strong, acids and strong bases. No known solvent dissolves or stress cracks the polymer at temperature up to 121 °C.
- It possesses excellent mechanical properties over a wide temperature from cryogenic temperature to 204 °C. It has nylon like durability and provides excellent impact resistance at ambient and subambient temperatures.
- It is fluoropolymer which is mouldable and weldable with an ordinary thermoplastic welding equipment.

## POLYVINYLIDENE FLUORIDE (PVDF)

PVDF is an engineering fluoropolymer, the grade containing no additives has remarkable properties. The most important of which are :

- Exceptional outdoor weather resistance, due to its transparency and total inertness to ultra-violet light.
- Excellent resistance to most of the chemicals.
- Remarkable thermal stability under operating and processing application temperatures. It does not darken when subjected to heat.
- Good abrasion resistance, enabling it to be used with slurries.
- Very low creep.
- High mechanical strength.
- The crystalline content of PVDF was chosen in order to obtain excellent properties, such as low permeability to gases & fluids as well as low swelling in certain solvents, while retaining a high impact resistance, good stress cracking resistance and a very high dimensional stability.
- PVDF may be used over wide temperatures from -40 °C to +140 °C. It is non-flammable and may be used for contact with foodstuffs.

## QUALITY ASSURANCE PLAN

SR. NO	ITEMS	PARAMETER	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOC.& ACCEPTANCE CRITERIA	FORMAT OR RECORD	AGENCY (P)	AGENCY (W)	AGENCY (R)
1	RAW MATERIAL								
	A) NON METALIC PARTS (Fluoro Polymers & Fluoro Carbons)	Intactness Grade Confirmation Physical Verification	Visual	100%	P.O. Specification & Product Data Sheets	TC	1 1 1	1 1 1	
	B) Casting ,Other Metallic Parts & Fasteners	Chemical Properties	Chemical Analysis	Sample/Batch	Lab.Test Certificate / Manufactures TC	TC			2
2	INPROCESS								
	VALVE BODY, SEAT, BALL,DISC & OTHER PARTS	POROCITY CHECK, PHYSICAL VERIFICATION DIMENSIONS	Spark Test Visual, Mearsurement	100%	Standard Moulding Documents/Mfg. Drawings	IR	1	1	
	VALVE ASSEMBLY		Mearsurement		Mfg. Drawings				
3	FINISHED PRODUCTS								
	VALVES	Leakage Test (Body & Seat)	Hydro Test	100%	Standard Test Procedure/Apprd. Data	IR	1	2 (10%)	
		Lining Intactness	Spark Test	100%	Sheet/Drg. Apprd. Drg.		1	2 (10%)	
		Dimension, Workmanship	Measurment, Visual	100%	Apprd. Assembly-Drawing	IR	1	2 (10%)	

LEGENDS P : PERFORM | W : WITNESS | R : REVIEW | 1. UNP POLYVALVES | 2. CLIENT / AGENT





### ACTUATION OPTIONS OFFERED BY UNP

ACTUATOR TYPE	SINGLE ACTING / SPRING RETURN	DOUBLE ACTING
FAIL POSITION	OPEN/CLOSE	STAY PUT
AIR SUPPLY PRESSURE	4/5 BAR OR 58/72 PSI	4/5 BAR OR 58/72 PSI
BODY MATERIAL OFFERED	AL.ANODIZED/CF8 OR CF8M	AL.ANODIZED/CF8 OR CF8M
MAKE OFFERED	EL-O-MATIC/ROTEX/I-TORK	EL-O-MATIC/ROTEX/I-TORK

### SOLENOID VALVES OFFERED

SOLENOID VALVE	SINGLE ACTING / SPRING RETURN ACTUATOR	DOUBLE ACTING ACTUATOR
TYPE	3/2 WAY NAMUR / NON-NAMUR	5/2 WAY NAMUR / NON-NAMUR
COIL RATING	24/110/220 V AC OR 24/110 V DC	24/110/220 V AC OR 24/110 V DC
COIL INSULATION CLASS	F OR H	F OR H
COIL HOUSING	WEATHER PROOF/EX-PROOF/FLAME PROOF OR IS	WEATHER PROOF/EX-PROOF/FLAME PROOF OR IS
SOLENOID VALVE BODY MATERIAL	ALLUMINIUM/SS 316/SS 316L	ALLUMINIUM/SS 316/SS 316L
GLAND CONNECTION	1/4" / 1/2" or 3/4" NPT	1/4" / 1/2" or 3/4" NPT

### LIMIT SWITCHES OFFERED

LIMIT SWITCH	MECHANICAL MICROSWITCH	PROXIMITY TYPE
SWITCHES OFFERED	HONEYWELL OR SIMILAR	P & F OR SIMILAR
NO. OF SWITCHES	1 NO + 1 NC OR 2 NO + 2NC	1 NO + 1 NC OR 2 NO + 2 NC
HOUSING TYPE	WEATHER PROOF / FLAME PROOF	WEATHER PROOF / FLAME PROOF

UNP PROVIDES ELECTRO PNEUMATIC POSITIONERS OF YTC / SIEMENS OR ANY OTHER MAKE OF CUSTOMER PREFERENCE

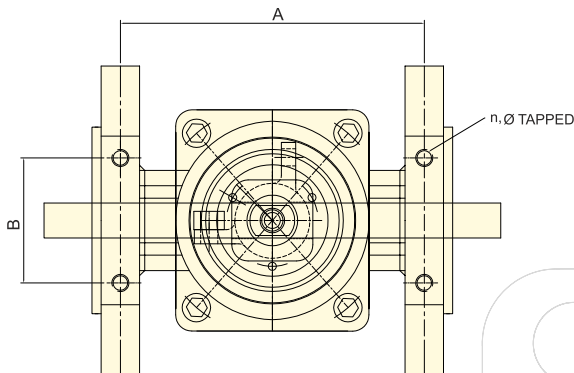


Pneumatically Actuated Plug Valve Control Application



Characterized Plug

### DETAILS FOR MOUNTING BRACKET



SIZE	A		B		n	Ø (TAPPED)
	INCH	MM	INCH	MM		
0.5"	3.62	92	1.37	35	04	M6X15MM DEEP
1"	4.33	110	1.57	40	04	M8X20MM DEEP
1.5"	5.59	142	1.57	40	04	M8X20MM DEEP
2"	5.90	150	1.96	50	04	M8X20MM DEEP
3"	6.69	170	2.75	70	04	M10X25MM DEEP
4"	7.75	197	3.14	80	04	M10X25MM DEEP
6"	9.21	234	3.93	100	04	M12X25MM DEEP
8"	10.1	257	4.43	110	04	M12X30MM DEEP



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[www.polyvalve.com](http://www.polyvalve.com)

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ISO 9001:2008



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- UNP Polyvalves does not assume any responsibility for the data given in this brochure. It is necessary for the customers to carry out necessary tests before selecting the MOC for their applications.