An Answer to your corrosion problems

2013-14

UNP Polyvalves

PFA / FEP / ECTFE / ETFE / PVDF LINED

VALVES & PIPING SYSTEM

HI-TECH POLYMERS
Is Certified Manufacturing Unit by

ISO 9001:2008 CE 1128

UNPPolyvalves

PTFE / PFA / FEP / ECTFE / PVDF LINED VALVES & PIPING SYSTEM

ABOUT US

UNP Polyvalves (India) Pvt. Ltd. is manufacturing giant that produces various types of corrosion free valves, pipes and pipe fittings manufactured in advanced engineering plastics.

Kicked off two decades ago, with manufacturing of ball valves ranging for 15 NB to 50 NB, today UNP Polyvalves has the product range in valves comprising of Ball, Diaphragm, Butterfly, Ball Check, Foot, Sight glass, Sampling, Strainers, Lined valves, Pipes & Fittings etc. UNP Polyvalves also specializes in single shot molding capacity up to 30kg, which is an achievement in itself.

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.

Thus, UNP Polyvalves possesses live skill sets headed by highly knowledgeable, technically and administratively experienced entrepreneurs. These experts lead and guide the team of technically qualified engineers with a vision to offer elevated quality standards, optimum realization of value for money and satisfaction to the customers.

Over the years, UNP Polyvalves has been dealing with almost every leading chemical, petrochemicals, pharmaceuticals related giants in India and is also exporting to such projects overseas in the countries like Bangladesh, Brazil, Egypt, Indonesia, Kenya, Kuwait, Thailand, U.A.E, Morocco, Chile, Qatar, U.S.A. et.al.

ACHIEVEMENTS

UNP Polyvalves has permanently resolved the problems for piping systems of steel industries, Chloralkali projects and many other chemical plants with introduction of right material of construction for their most aggressive and corrosive applications. UNP Polyvalves has carried out numerous projects and has approvals of major project consultants of India and abroad, Consultants such as UHDE, Jacobs H&G, Dalal Mott Macdonald, Chemtex, Toyo Engineering. TUV India, Kvaerner Powergas, Kvaerner John Brown, EIL etc.

SCOPE

To meet this ever growing demand, UNP Polyvalves has its base spread over three plants at Baroda, Gujarat, where full fledge manufacturing activities are carried out here under one roof. The company has its indigenous marketing base at Thane, Maharashtra to bump into its all kind of marketing and sales requirements. UNP Polyvalves also cherishes a team of well qualified technical experts for research and development as well for production.

Survival of the fittest is policy of nature

Only Quality lasts forever, we practice

GENERAL PROPERTIES OF POLYMERS

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
	ETFE	1.70	0.007	75	6700	2.0	300	176	310-330	-100 to +160
ASTMD2116	FEP	2.15	0.004	60	3400	2.9	325	260	350-370	205
ASTMD3307	PFA	2.15	< 0.03	72	3600	1.2	300	305	350-370	260

TECHNICAL PROPERTIES OF PVDF

Physical Properties	Standards	Units	Value
Density	ISO 1183	g/cm3	1.78
Water absorption (24 h at 23°C)	ISO 62 (method 1)	%	<0.04
Melt Flow Index	ASTM D 1238 230°C, 10 kg 230°C, 5 kg 230°C, 2.16 kg	 g/10 min g/10 min g/10 min	 - 24 8
Mechanical Properties			
Tensile	ASTM D 368		
Tensile stress at yield		MPa/psi	53-57/7685-8265
Tensile stress at break	23°C, 50 mm/min	MPa/psi	35-50/5075-7250
Elongation at yield		%	5-10
Elongation at break		%	20-50
Modulus	23°C, 1 mm/min	MPa/psi	2500/362500
Flexion	ASTM D 256		
Maximum load	23°C	MPa/psi	78/11310
Modulus	2 mm/MIN	MPa/psi	2200/319000
IZOD impact	ASTM D 256	J/m	65
(notched V 10 mm-at 23°C -4 mm thick			
Shore D Harness (2 mm thick)	ASTM D 2240	-	77
Abrasion resistance	TABER CS 10/1 kg	mg/1000 rev	5-10
Friction coefficient : static dynamic	ASTM D 1894	- -	0.2-0.4 0.2-0.3
Thermal Properties			
Crystallinity by DSC	ASTM D 3418		
Melting point		°C/°F	174/345
Heat of fusion (80°C to end of melting)		J/g	62
Crystallizing point		°C/°F	139/282
Crystallization heat		J/g	58
VICAT point (4 mm thick)	ISO 306		
load 1kg		°C/°F	170/338
deflection temperature (4 mm thick)	ASTM D 648		
load 0.46 MPa	after annealing	°C/°F	147/294
load 1.82 MPa		°C/°F	112/234
glass transition (Tg)	DMTA	°C/°F	-32/-26
Brittleness temperature (on 2 mm pressed sheet)	ASTM D 746 A	°C/°F	0-10/32-50
Molding shrinkage		%	2-3
Thermal stability	TGA begining & at 1%	°C/°F	375-400/707-752
Linear thermal expansion coefficient	weight loss in air	10-6k[1]	120-140
Thermal conductance at 23°C	ASTM D 696	W/m.k	0.2
Specific heat	ASTM C 177 23°C & 100°C	J/g.k	1.2-1.6
Electrical Properties			
Surface resistivity	ASTM D 257		
Voltage < 1V. after 2 min - 500 V at 23°C	DIN 53483		
Volume resistivity	ASTM D 257	ohm/square	$>1.10^{11}$
Intensity = 10 mA, after 2 min at 23°C	DIN 53483	 ohm.cm	 $>1.10^{14}$
Fire Resistance			
UL-94 Flammability test	UL-94	Class	V.O
Limiting Oxygen Index (sheet 3 mm thick)	ASTM D 2863	%	44

PROPERTIES OF FLUOROPOLYMER AND FLUOROCARBON RESINS

Property	Standards(ASTM)	Units	FEP	PFA	ETFE
Specific gravity	D792	-	2.15	2.15	1.7
Melting point	DTA-E 168	°F °C	500 260	582 305	512 267
Tensile strength 73°F 23°C	D638	 psi Mpa	 3400 23	 3600 25	 6700 47
Elongation, 73°F/23°C	D 638	%	325	300	300
Flex modulus 73°F 23°C	D 790	 psi Mpa	 90000 586	 90000 586	 170000 1200
Hardness durometer	D 2240	D	D 56	D 60	D 75
Dielectric constant 1MHZ	D 150		2.02	2.1	2.6
Dielectric strength short time 10 mil 025 mm	D 149	V/mil kv/mm	2000 80	>2000 80	1800 70
Dissipation factor1MHZ	D 150	-	0.0007	0.0001	0.0072
Volume resistivity	D 257	ohm-cm	10	10	10
Water absorption. 24 hours	D 570	%	<0.004	<0.03	<0.007
Weather resistance	Florida Exposure	Yrs unaffected	20	10	5
Limiting oxygen Index	D 2863	%	93	95	30
Flame rating	UL 94	-	VO	VO	VO
Impact strength 73°F 23°C -65°F -54°C	D 256	 ft-lb/in j/m ft-lb/in j/m	 no break 2.9 154.8	 no break 1.2 64	 no break 2 106.8
Chemical resistance		excellent in chemical service INERT TO ALMOST EVERY CHEMICAL			

Polyvinylidene Fluoride (PVDF)

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

1 Exceptional outdoor weather resistance, due to its transparency and total inertness to ultra-violet light.

2 Excellent resistance to most of the chemicals.

3 Remarkable thermal stability under operating and processing application temperatures. It does not darken when subjected to heat.

4 Good abrasion resistance, enabling it to be used with slurries.

5 Very low creep.

6 High mechanical strength.

7 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.

8 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 FOR FLUOROPOLYMER LINED VALVES

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 metallic 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 / Manufacturers TC	TC			2
2.	**INPROCESS**								
	Valve body, Seat, Ball, Disc & other parts **Valve Assembly**	Porocity Check, Physical verification Dimensions	Spark Test Visual, Measurement Measurement	100%	Standard Moulding documents/Mfg. Drawings Mfg. Drawings	IR	1	1	
3.	**FINISHED PRODUCTS**								
	Valves	Leakage Test (Body & Seat) Lining Intactness Dimension, Workmanship	Hydro test Spark Test Measurement, Visual	100% 100% 100%	Standard Test Procedure/Apprd. Data sheet/Drg. Apprd. Drg. Apprd. Assembly - Drawing	IR IR	1 1 1	2 (10%) 2 (10%) 2 (10%)	

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

The Above said QAP is our internal procedure of QA & QC.

We provide our Internal Inspection Report & MOC compliance Certificates to our customers.

Based on Internal Inspection Report, we allow our customer to check following :

1. Physical verification of valves & quantity check.
2. Witnessing a leakage test i.e. hydro test as per our standard test procedure & pressure rating confirmed by us only for acceptance sampling i.e. 10% of the total quantity.
3. Dimension check of final assembly of valve as per our standard drawings.

Ethylene Tetra Fluoro Ethylene (ETFE)

1 It has very high temperature resistance from -100°C to+160°C.

2 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 temp, up to 121°C.

3 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.

4 It is fluoropolymer which is mouldable & weldable with an ordinary thermoplastic welding equipment.

QUALITY ASSURANCE PLAN FOR PTFE/PFA/FEP LINED PIPES & FITTINGS

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) PTFE, PFA / FEP LINER	Specs. for lining Grade Confirmation Physical Verification	Visual Dimensional	100% 100%	P.O. Specification & Product Data Sheets	TC	1 1 1	1 1 1	
	b)CS Pipes, Flanges & Castings	Chemical Properties	Chemical analysis	Sample/Batch	Lab. Test Certificate /	TC	1	1	2
		Physical Verification	Visual Dimensional	100% 100%	Manufacturers TC		1 1	1 1	2
2.	INPROCESS								
	Fabrication & Lining	Dimension Physical verification Intactness	Measurement Visual, Visual	100% 100% 100%	Standard Lining documents/Mfg.Drawings	IR	1 1	1 1	
3.	FINISHED PRODUCTS								
	PTFE lined Pipes & PTFE / PFA / FEP Lined Fittings	Leakage Test	Hydro test	100%	Standard Test Procedure/ Apprd. Data sheet/ Manufacturer's Drawing	IR	1	2 (5%)	
		Lining Intactness	Spark Test	RANDOM		IR	1	2 (5%)	
		Dimension, Workmanship	Measurement, Visual	100%		IR IR	1	2 (5%)	

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

The Above said QAP is our internal procedure of QA & QC.

We provide our Internal Inspection Report & MOC compliance Certificates to our customers.

Based on Internal Inspection Report, we allow our customer to check following :

1. Physical verification of items & quantity check.
2. Witnessing a leakage test i.e. hydro test as per our standard test procedure & pressure rating confirmed by us only for acceptance sampling i.e. 5% of the total quantity.
3. Dimension check of final items as per our standard drawings.

Teflon FEP "Perfluoro (Ethylene Propylene) Copolymer"

1 FEP is a fluorocarbon resin having very strong interatomic bonds between Carbon & Fluorine atoms.

2 It has very high molecular Weight or long molecular chain length compared to other polymers.

3 FEP can be used for continuous service temperature upto an elevated temperatures as high as 205°C (400°F).

4 This fluorocarbon is resistant to all chemicals agressive and hazardous in nature.

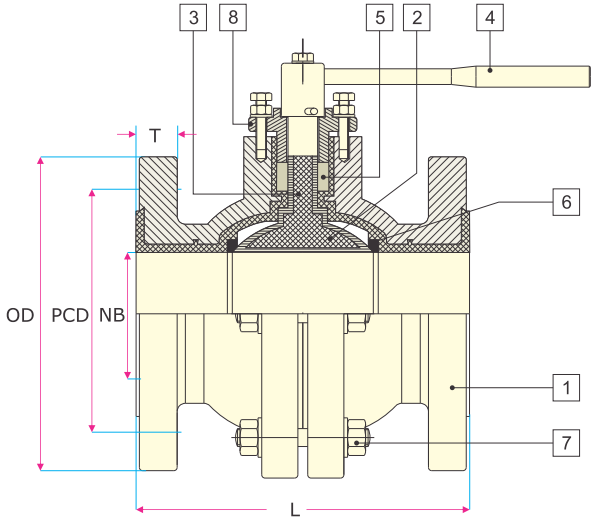
5 Absorption rate of this fluorocarbon is as lower as 0.004%, hence swelling is avoided, and permiation is negligible.

PFA (Per Fluro Alkoxy)

PFA is also a Flurocarbon 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)

LINED BALL VALVE

LEVER OPERATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS / SS + PPH/PVDF /PFA /FEP
			LINED LINING THICKNESS: 3mm
2	BALL	1	CS/SS + PPH /PVDF / PFA / FEP
			LINED
3	STEM	1	CS/SS + PPH/PVDF / FEP / PFA
			LINED INTEGRAL PART OF BALL
4	HANDLE	1	MS EPOXY PAINTED
5	GLAND SEAL	1	PTFE
6	SEAT	2	PTFE
7	FASTENERS	—	SS-304 / STEEL PLATED
8	GLAND COVER	1	CS / SS EPOXY PAINTED

HYDRO PRESSURE:
15mm TO 100mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

FOR 150 mm
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	OD	T
15 mm	108	89	14
20 mm	127	98	14
25 mm	127	108	16
40 mm	165	127	19
50 mm	178	152	20.5
65 mm	190	180	23
80 mm	203	191	25
100 mm	229	229	25
150 mm	267	280	28

PCD as per ANSI B 16.5 Standard, 150#

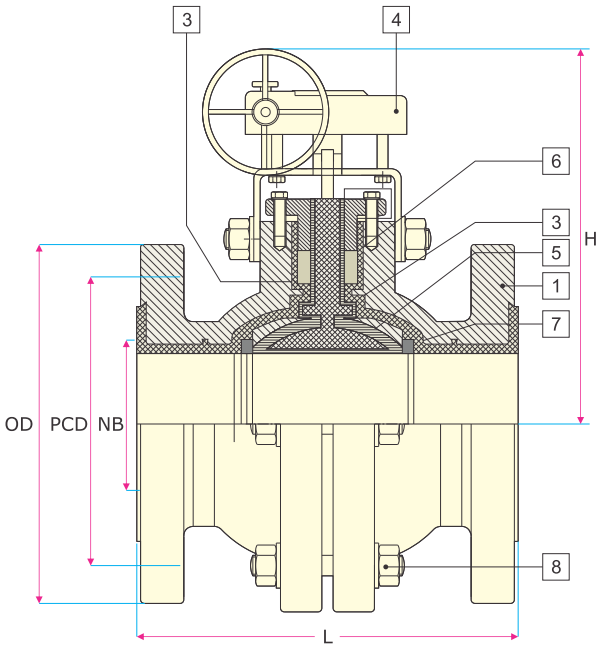
Notes:

1. **Manufacturing Standards**
   Design : BS EN 17292 (BS 5351) Short Pattern
   Face To Face Dimension: ANSI B 16.10
   Flange Connection : ANSI B 16.5; 150#;RF
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

*- UPTO 100 NB SIZE INVESTMENT CASTING.

LINED BALL VALVE (LARGE DIA)

GEAR OPERATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	ASTM A 216 GR. WCB/ASTM A 351 GR CF8+PFA LINED 450 HP GR.
2	LINING	—	3-5 MM THK. PFA ON ALL WETTED PARTS AND RAISED FACES.
3	SPINDLE	1	ASTM A 351 GR. CF8+ PFA LINED INTEGRAL TO BALL
4	GEAR BOX	1	CI EPOXY PAINTED
5	BALL	1	ASTM A 351 GR CF8+ PFA LINED 450 HP GRADE
6	GLAND PACKING	2	PTFE
7	SEAT	—	PTFE
8	FASTENERS	1	HT STEEL PLATED

HYDRO PRESSURE:
200mm TO 300mm
BODY : 9 Kg/Cm^2
SEAT : 7 Kg/Cm^2

* INCASE OF SPECIAL REQUIREMENT PN10 PRESSURE RATING CAN BE PROVIDED.

Dimensional Table

SIZE (NB)	L±5	OD±2	T±3	H APP	PCD	No. OF HOLES	HOLES DIA
200 mm	457	343	30	575	298	08	22
250 mm	533	406	33	625	362	12	25
300 mm	610	485	35	710	432	12	25

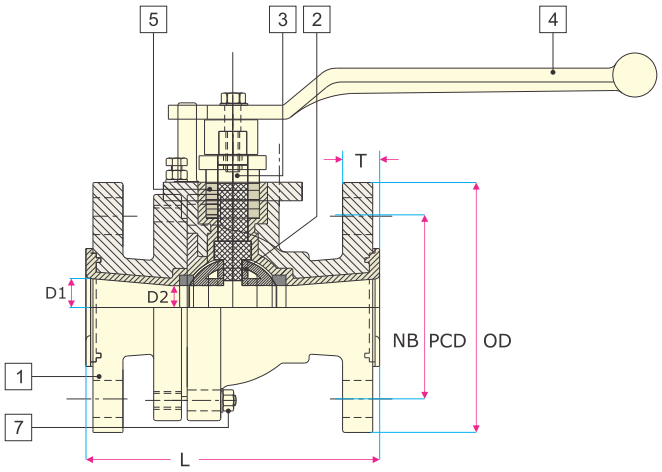
PCD as per ANSI B 16.5 Standard, 150#

Notes:

1. **Manufacturing Standards**
   Design : BS EN 17292 (BS 5351)Long Pattern
   Face To Face Dimension: ANSI B 16.10
   Flange Connection : ANSI B 16.5; 150#;RF
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED BALL VALVE

SIDE SPLIT DESIGN, REGULAR PORT



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	ASTM A 216 GR. WCB + PFA LINING
			(MIN. 3 MM THK.) ON ALL
			WETTED PARTS & RAISED FACES.
2	BALL	1	CF8 (INVESTMENT CASTING)
			INSERTED PFA LINED
			(MIN. 3MM THK.)
3	STEM	1	CF8 (INVESTMENT CASTING) PFA
			LINED (MIN. 3 MM THK.)
4	HANDLE	1	CS EPOXY PAINTED
5	GLAND SEAL	1	PTFE
6	SEAT	2	PTFE
7	FASTENERS	—	HT STEEL PLATED
8	GLAND COVER	1	CS EPOXY PAINTED

HYDRO PRESSURE:
15mm TO 100mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	D1	D2	OD ±1	T ±3	PCD ±16	No. OF HOLES	Holes DIA
25 mm	127	25	19	108	17	79	04	16
40 mm	165	40	25	127	19	98	04	16
50 mm	178	50	40	152	20.5	121	04	19
80 mm	203	80	50	191	25	152	04	19
100 mm	229	100	80	229	25	191	08	19

PCD as per ANSI B 16.5 Standard, 150#

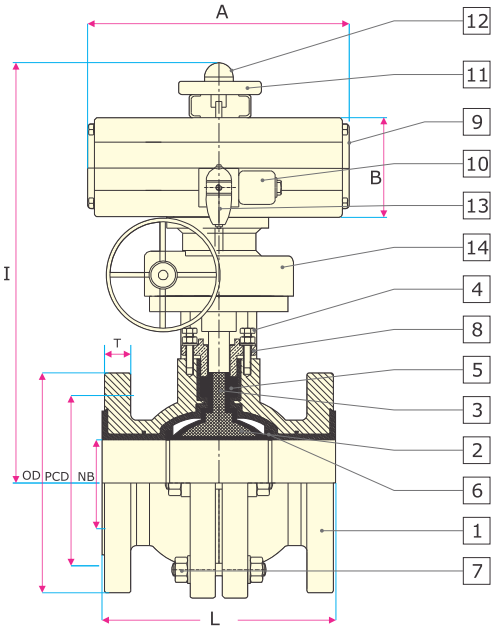
Notes:

1. **Manufacturing Standards**
   - Design : BS EN 17292 (BS 5351) Short Pattern
   - Face To Face Dimension: ANSI B 16.10/EN558 Series 1
   - Flange Connection : ANSI B 16.5; 150#;RF
   - Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   - PTFE : ASTM D 1457
   - PVDF : ASTM D 3222
   - PFA : ASTM D 3307
   - FEP : ASTM D 2116
4. **Material**
   - CS : ASTM A 216 GR. WCB
   - SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

*- UPTO 100 NB SIZE INVESTMENT CASTING.

LINED BALL VALVE

PNEUMATICALLY ACTUATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS / SS + PPH/PVDF / PFA / FEP
			LINED LINING THICKNESS: 3mm
2	BALL	1	CS/SS + PPH/PVDF / PFA / FEP
			LINED
3	STEM	1	CS/SS + PPH/PVDF / FEP / PFA
			LINED INTEGRAL PART OF BALL
4	GLAND COVER BOLT	1	H T/SS
5	GLAND SEAL	1	PTFE
6	SEAT	2	PTFE
7	FASTENERS	—	SS-304 / STEEL PLATED
8	GLAND COVER	1	CS/SS EPOXY PAINTED
9	PNEUMATIC ACTUATOR	1	ALUMINIUM ALLOY
10	SOLENOID VALVE	1	STANDARD
11	LIMIT SWITCH	2	STANDARD
12	POSITION INDICATOR	1	STANDARD
13	AIR FILTER REGULATOR	1	STANDARD
14	MANUAL OVERRIDE	1	CAST IRON

HYDRO PRESSURE:
15mm TO 100mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

FOR 150 mm
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

Dimensional Table

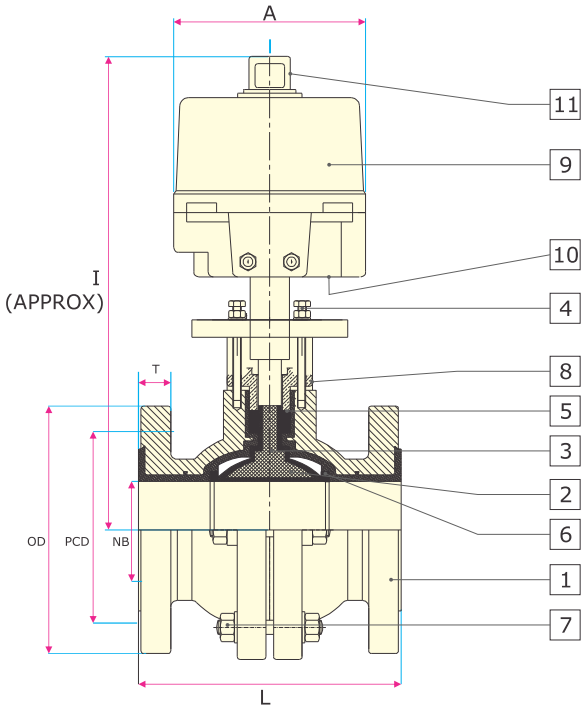
SIZE (NB)	L±3	OD	T	A	B	I
15 mm	108	89	14			
20 mm	118	98	14			
25 mm	127	108	16			
40 mm	165	127	19			
50 mm	178	152	20.5	Dimensions may vary as per actuator make & models & will be provided with offer drawing as per customer requirement.		
65 mm	190	180	23			
80 mm	203	191	25			
100 mm	229	229	25			
150 mm	267	280	28			

PCD as per ANSI B 16.5 Standard, 150#

Notes:
1. **Manufacturing Standards**
   Design : BS EN 17292 (BS 5351) Short Pattern
   Face To Face Dimension: ANSI B 16.10
   Flange Connection : ANSI B 16.5; 150#;RF
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Make Of Actuators**
   EL-O-MATIC / EQUIVALENT
5. **Operation Control**
   A). On-off (NO Or NC) Control
   B). Regulation Control With E P Positioner
6. **Material**
   CS : ASTM A 216 Gr. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED BALL VALVE

ELECTRICALLY ACTUATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS / SS + PPH/PVDF / PFA / FEP
			LINED LINING THICKNESS: 3mm
2	BALL	1	CS/SS + PPH/PVDF / PFA / FEP
			LINED
3	STEM	1	CS/SS + PPH/PVDF / FEP / PFA
			LINED INTEGRAL PART OF BALL
4	GLAND COVER BOLT	2	H T/SS
5	GLAND SEAL	1	PTFE
6	SEAT	2	PTFE
7	FASTENERS	—	SS-304 / STEEL PLATED
8	GLAND COVER	1	CS/SS EPOXY PAINTED
9	ELECTRICAL ACTUATOR	1	ALUMINIUM ALLOY
10	MANUAL OVERRIDE	1	STANDARD IN BUILT
11	POSITION INDICATOR	1	STANDARD

HYDRO PRESSURE:
15mm TO 100mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

FOR 150 mm
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	OD	T	A	B	I
15 mm	108	89	14			
20 mm	118	98	14			
25 mm	127	108	16			
40 mm	165	127	19			
50 mm	178	152	20.5			
65 mm	190	180	23	Dimensions may vary as per actuator make & models & will be provided with offer drawing as per customer requirement.		
80 mm	203	191	25			
100 mm	229	229	25			
150 mm	267	280	28			

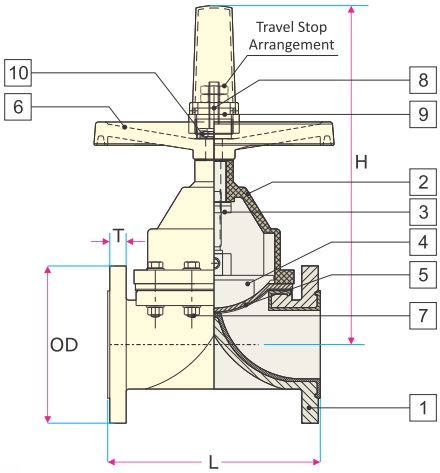
PCD as per ANSI B 16.5 Standard, 150#

Notes:

1. **Manufacturing Standards**
   Design : BS EN 17292 [BS 5351] Short Pattern
   Face To Face Dimension: ANSI B 16.10
   Flange Connection : ANSI B 16.5; 150#;RF
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Make Of Actuators**
   BELIMO /EQUIVALENT
5. **Operation Control**
   A). On-off (NO Or NC) Control
   B). Regulation Control With E P Positioner
6. **Material**
   CS : ASTM A 216 Gr. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED DIAPHRAGM VALVE

RISING SPINDLE / RISING HAND WHEEL TYPE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	ASTM A 216 WCB+PFA/FEP LINED
			LINED LINING THICKNESS: 3mm
2	BONNET	1	CS/CI EPOXY PAINTED
3	SLEEVE & SPINDLE	1	SS-304
4	COMPRESSOR	1	CS/CI
5	DIAPHRAGM	1	PTFE PADDED WITH EPDM RUBBER
6	HAND WHEEL	1	CS/CI EPOXY PAINTED
7	FASTENERS	—	IS 1367 CLASS 4.6 (PLATED)
8	POSITION INDICATOR	1	CS / SS EPOXY PAINTED
9	INDICATOR CAP	1	POLYCARBONATE
10	HANDWHEEL NUT	1	IS 1367 CLASS 4.6 (plated)

HYDRO TEST PRESSURE:
FROM 15MM TO 65 MM
BODY : 15 Kg/Cm^2
SEAT : 10 Kg/Cm^2

FROM 65 MM TO 100 MM
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

FROM 100 MM TO 200 MM
BODY : 7 Kg/Cm^2
SEAT : 7 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	OD	T	H
25 mm	133	108	16	142
40 mm	166	127	19	160
50 mm	196	152	21	200
65 mm	222	178	23	250
80 mm	260	191	25	280
100 mm	311	230	25	350
150 mm	412	280	27	510
200 mm	527	343	30	590

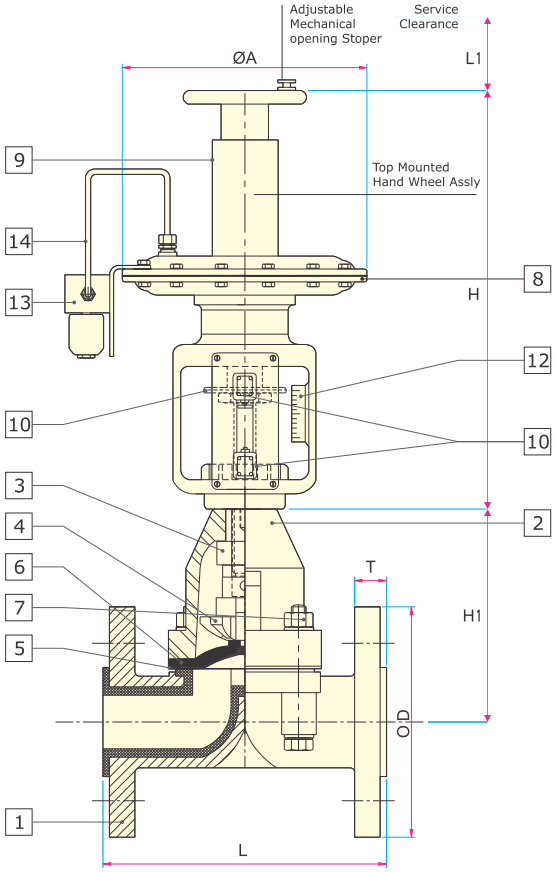
PCD as per ANSI B 16.5 Standard, 150#

Notes:

1. **Manufacturing Standards**
   Design : EN 13397 : 2002 (BS 5156)
   Face To Face Dimension: EN-558-1 Series 7 &1
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED DIAPHRAGM VALVE

PNEUMATICALLY ACTUATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS / SS + PPH/PVDF / FEP / PFA
			LINED LINING THICKNESS: 3mm
2	BONNET	1	CS / CI
3	SLEEVE & SPINDLE	1	SS-304 / SS-410
4	COMPRESSOR	1	ASTM A 216 GR WCB / CI
5	DIAPHRAGM	1	PTFE
6	RUBBER PAD	1	EPDM
7	FASTENERS	—	SS-304 / STEEL PLATED
8	PNEUMATIC ACTUATOR	1	CAST IRON EPOXY PAINTED
9	HAND WHEEL ASSEMBLY	1	CAST IRON EPOXY PAINTED
10	LIMIT SWITCH	2	STANDARD
11	POSITION INDICATOR	1	BRASS/SS
12	INDICATOR SCALE	1	SS
13	SOLENOID VALVE	1	STANDARD
14	AIR TUBING	1	STEEL/SS

HYDRO TEST PRESSURE:

UPTO 65 NB; BODY : 15 Kg/Cm^2
SEAT : 10 Kg/Cm^2

FROM 65 NB UPTO 100 NB
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

ABOVE 100 NB
BODY : 7 Kg/Cm^2
SEAT : 7 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	OD	T	H1	H	A	L1
20 mm	133	108	16	70			
25 mm	133	108	16	70			
40 mm	166	127	19	90			
50 mm	196	152	21	130			
65 mm	222	178	23	140			
80 mm	260	191	25	180			
100 mm	311	230	25	230			
150 mm	412	280	27	380			
200 mm	527	343	30	405			

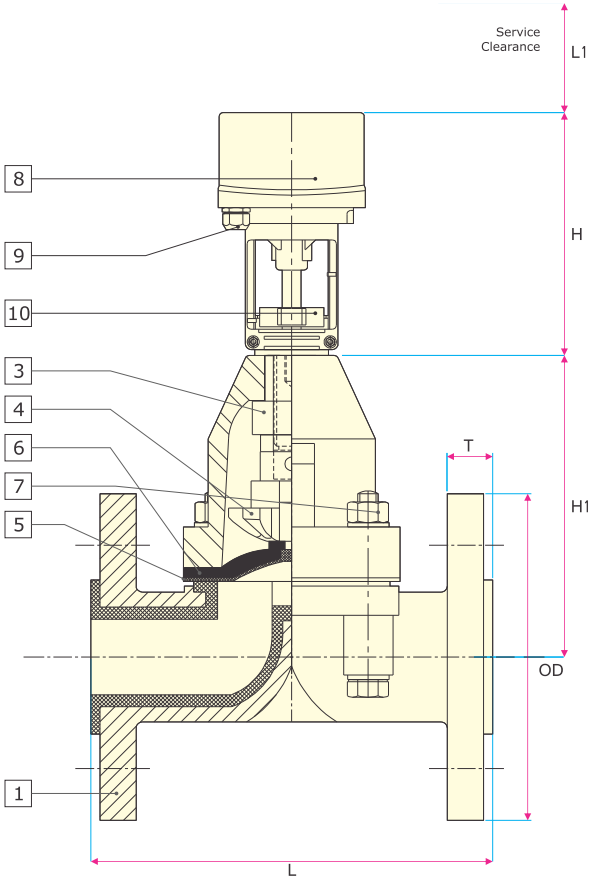
Dimensions may vary as per actuator make & models & will be provided with offer drawing as per customer requirement.

Notes:

1. **Manufacturing Standards**
   Design : EN 13397 : 2002 BS 5156
   Face To Face Dimension: EN-558-1 Series 7 & 1
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Make Of Actuators**
   PROCON
5. **Operation Control**
   A). On-off (NO or NC) Control
   B). Proportional Control with Pneumatic Positioner
6. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED DIAPHRAGM VALVE

ELECTRICALLY ACTUATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS / SS + PPH/PVDF / FEP / PFA
			LINED LINING THICKNESS: 3mm
2	BONNET	1	CS / CI
3	SLEEVE & SPINDLE	1	SS-304 / SS-410
4	COMPRESSOR	1	CS / CI
5	DIAPHRAGM	1	PTFE
6	RUBBER PAD	1	EPDM
7	FASTENERS	—	SS-304 / STEEL PLATED
8	ELECTRICAL ACTUATOR	1	STANDARD
9	MANUAL OVERRIDE	1	STANDARD IN BUILT
10	POSITION INDICATOR	1	STANDARD

HYDRO TEST PRESSURE:

UPTO 65 NB; BODY : 15 Kg/Cm^2
SEAT : 10 Kg/Cm^2

FROM 65 NB UPTO 100 NB
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

ABOVE 100 NB
BODY : 7 Kg/Cm^2
SEAT : 7 Kg/Cm^2

Dimensional Table

Rating :150 Class

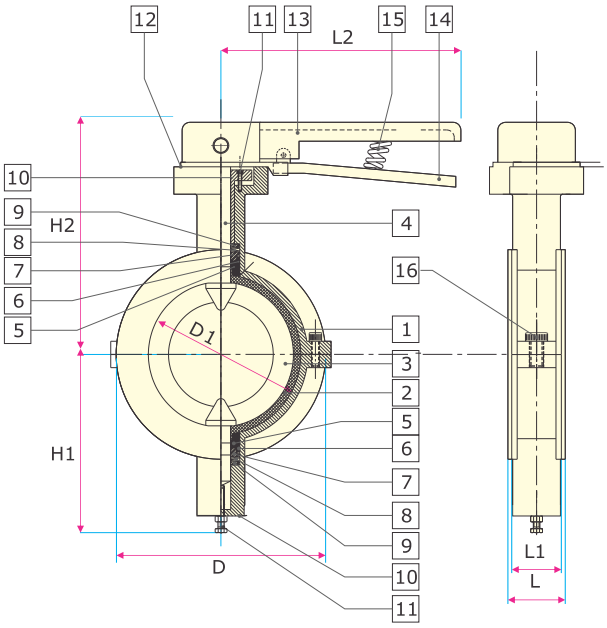
SIZE (NB)	L±3	OD	T	H1	H	L1
20 mm	133	108	16	70		
25 mm	133	108	16	70		
40 mm	166	127	19	90		
50 mm	196	152	21	130		
65 mm	222	178	23	140	Dimensions may vary as per actuator make & models & will be provided with offer drawing as per customer requirement.	
80 mm	260	191	25	180		
100 mm	311	230	25	230		
150 mm	412	280	27	380		
200 mm	527	343	30	405		

Notes:

1. **Manufacturing Standards**
   Design : EN 13397 : 2002 BS 5156
   Face To Face Dimension: EN-558-1 Series 7 & 1
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Make Of Actuators**
   BELIMO, MARSH, I-TORQUE
5. **Operation Control**
   A). On-off Control
   B). Modulating Control
6. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED BUTTERFLY VALVE

LEVER OPERATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS/SS EPOXY PAINTED
2	SEAT	1	P T F E
3	DISC	1	SS INSERTED PPH/ PVDF/ PFA/FEP
			LINED
4	STEM	1	SS 304 INTEGRAL TO DISC
5	STEM SEAL - TOP & BOTTOM	2	P T F E
6	SEAL CUP - TOP & BOTTOM	2	PPH / PVDF / PFA / FEP
7	TEE BUSH - TOP & BOTTOM	1	SS 304
8	DISC SPRING - TOP & BOTTOM	2	50 Crv 4
9	THRUST WASHER - TOP & BOTTOM	2	SS 304
10	THRUST COLLAR - TOP & BOTTOM	2	STEEL / SS
11	ADJUSTABLE BOLTS	1	SS / STEEL PLATED
12	POSITIONER LOCK PLATE	1	STEEL PLATED
13	HANDLE LEVER	1	STEEL POWDER COATED
14	POSITIONER LEVER	1	STEEL POWDER COATED
15	SPRING	1	SPRING STEEL POWER COATED
16	FASTENERS	1	H.T. STEEL / SS

HYDRO TEST PRESSURE:
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	L1±1	D1±2	D±2	H1±8	H2±8	L2±8
50 mm	51	43	50	92	96	148	260
65 mm	54	46	65	105	112	170	260
80 mm	54	46	75	127	110	170	260
100 mm	60	52	100	157	130	192	260

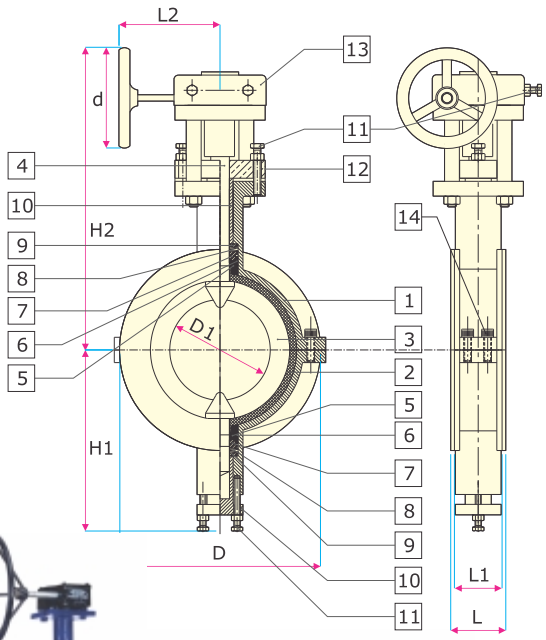
Notes:

1. **Manufacturing Standards**
   Design : API 609 - Wafer Type
   Face To Face Dimension: API 609 Category 'A'
   Connection Rating : ANSI B 16.5; 150#;
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 Gr. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

For minimum pipe ID required for full opening of disc, refer page No. 19

LINED BUTTERFLY VALVE

WAFER & LUGGED CONSTRUCTION
GEAR OPERATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS/SS EPOXY PAINTED
2	SEAT	1	P T F E
3	DISC	1	SS INSERTED PPH/ PVDF/ PFA/FEP LINED
4	STEM	1	SS 304 INTEGRAL TO DISC
5	STEM SEAL - TOP & BOTTOM	2	P T F E
6	SEAL CUP - TOP & BOTTOM	2	PPH / PVDF / PFA / FEP
7	TEE BUSH - TOP & BOTTOM	1	SS 304
8	DISC SPRING - TOP & BOTTOM	2	50 Crv 4
9	THRUST WASHER - TOP & BOTTOM	2	SS 304
10	THRUST COLLAR - TOP	2	STEEL / SS
11	ADJUSTABLE BOLTS	1	SS / STEEL PLATED
12	LOCK PLATE (FOR TOP SEAL)	1	MS. EPOXY PAINTED
13	GEAR BOX	1	CAST IRON
14	FASTENERS	1	H.T. STEEL / SS

YDRO TEST PRESSURE:
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	L1±1	D1±2	D±2	H1±8	H2±8	L2±8	d±8
125 mm	64	56	125	185	165	390	242	250
150 mm	64	56	150	216	190	425	242	250
200 mm	70	60	200	270	200	465	242	250
250 mm	80	68	250	323	250	565	275	350
300 mm	90	78	300	380	295	600	275	350
350 mm	90	78	350	412	335	650	275	350

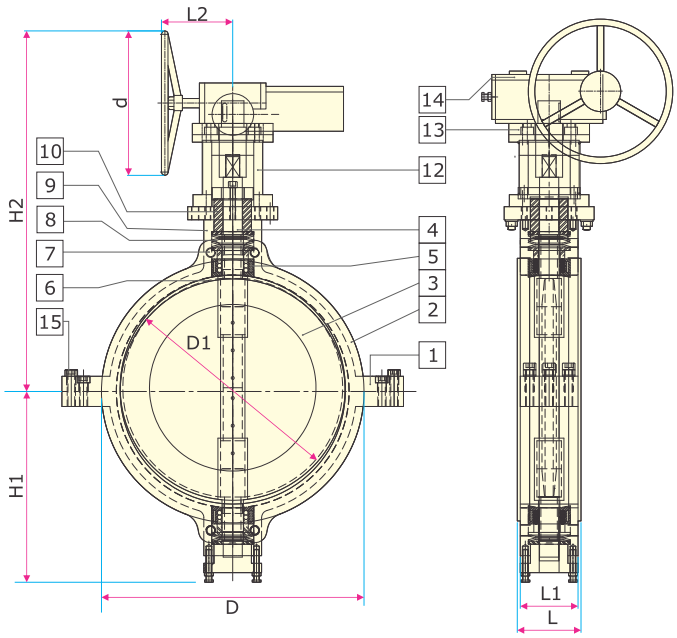
Notes:

1. **Manufacturing Standards**
   Design : API 609 - Wafer Type
   Face To Face Dimension: API 609 Category 'A'
   Connection Rating : ANSI B 16.5; 150#;
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 Gr. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

For minimum pipe ID required for full opening of disc, refer page No. 19

LINED BUTTERFLY VALVE

GEAR OPERATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS/SS EPOXY PAINTED
2	SEAT	1	PTFE
3	DISC	1	SS INSERTED PFA LINED
4	STEM	1	SS 304 INTEGRAL TO DISC
5	STEM SEAL - TOP & BOTTOM	2	PTFE
6	SEAL CUP - TOP & BOTTOM	2	PFA
7	TEE BUSH - TOP & BOTTOM	1	SS 304
8	DISC SPRING - TOP & BOTTOM	2	50 Crv 4
9	THRUST WASHER - TOP & BOTTOM	2	SS 304
10	THRUST COLLAR - TOP	2	SS
11	ADJUSTABLE BOLTS	–	STEEL PLATED
12	HOUSING FOR GEARBOX MOUNTING	1	CAST IRON
13	GEAR BOX MOUNTING PLATE	1	MS. EPOXY PAINTED
14	GEAR BOX	1	CAST IRON EPOXY PAINTED
15	FASTENERS	–	H.T. STEEL

HYDRO TEST PRESSURE:
For size 400mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

For size 450, 500 & 600 mm
BODY : 9 Kg/Cm^2
SEAT : 7 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	L1±1	D1±2	D±2	H1±8	H2±8	L2±8	d±8
400 mm	114	102	400	470	365	685	335	600
450 mm	130	114	450	534	400	875	335	600
500 mm	143	127	500	585	435	910	335	600
600 mm	170	154	598	705	518	1100	361	600

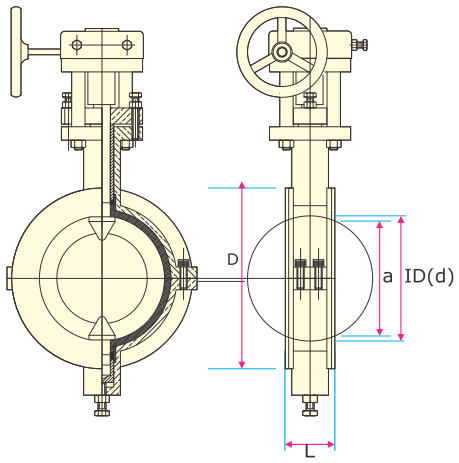
Notes:

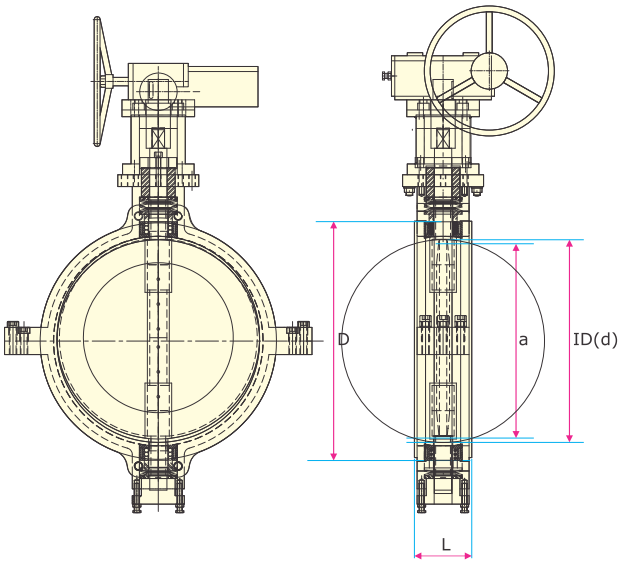
1. **Manufacturing Standards**
   Design : API 609 - Wafer Type
   Face To Face Dimension: API 609 Category 'A'
   Connection Rating : ANSI B 16.5; 150#;
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 Gr. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

For minimum pipe ID required for full opening of disc, refer page No. 19

INSTALLATION DETAILS

WAFER & LUGGED CONSTRUCTION
LINED BUTTERFLY VALVE





Minimum Pipe ID Required for full disc opening

Dimensional Table

Rating :150 Class

SIZE (NB)	F/F	D	a	Pipe I.D. Req.(d)
600 mm	170	700	575	585
500 mm	143	584	477	490
450 mm	130	534	430	440
400 mm	114	470	384	390
350 mm	90	412	338	344
300 mm	90	380	286	292
250 mm	80	323	236	242
200 mm	70	270	187	193
150 mm	64	216	136	140
125 mm	64	185	107	110
100 mm	60	157	80	83
80 mm	54	127	52	55
65 mm	54	105	36	39
50 mm	51	92	Valve disc open inside L	

L = Face to face dimension of Butterfly Valve
a = Chord of disc in open position
ID (d) = Minimum Pipe ID required

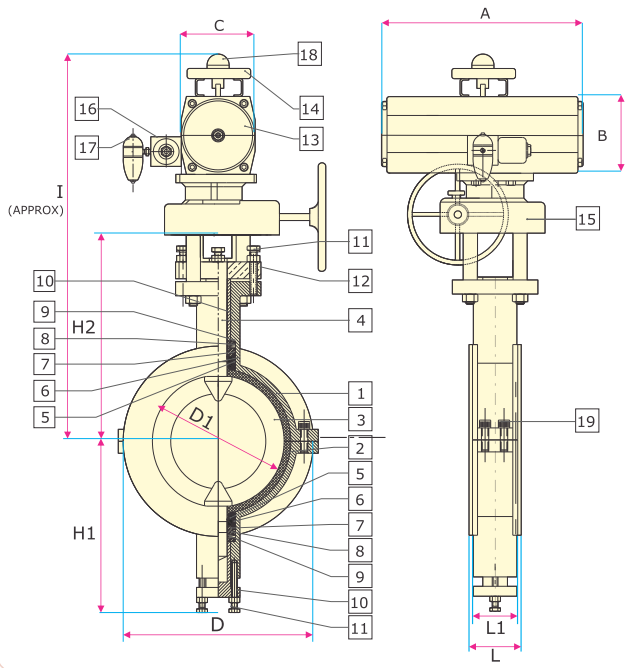
50 mm to 100 mm size **Lever Type**
Above 100 mm size **Gear Type**

Notes:

1. **Manufacturing Standards**
   Design : API 609 - Wafer Type
   Face To Face Dimension: API 609 Category 'A'
   Connection Rating : ANSI B 16.5; 150#;
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 Gr. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED BUTTERFLY VALVE

PNEUMATICALLY ACTUATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS / SS EPOXY PAINTED
2	SEAT	1	PTFE
3	DISC	1	SS INSERTED
			PPH/PVDF/PFA/FEP
4	STEM	1	SS 304 PPH/PVDF/PFA/FEP
			LINED INTEGRAL TO DISC
5	STEM SEAL - TOP & BOTTOM	2	PTFE
6	SEAL CUP - TOP & BOTTOM	2	PPH/PVDF/PFA/FEP
7	TEE BUSH - TOP & BOTTOM	1	SS-304
8	DISC SPRING - TOP & BOTTOM	2	50 Crv 4
9	THRUST WASHER - TOP & BOTTOM	2	SS 304

NO.	DESCRIPTION	QTY.	MATERIAL
10	THRUST COLLAR - TOP & BOTTOM	2	STEEL/SS
11	ADJUSTABLE BOLTS	1	SS/STEEL PLATED
12	LOCK PLATE (FOR TOP SEAL)	1	CAST IRON
13	PNEUMATIC ACTUATOR	1	ALUMINIUM ALLOY
14	LIMIT SWITCH	2	STANDARD
15	MANUAL OVERRIDE	1	CAST IRON
16	SOLENOID VALVE	1	STANDARD
17	AIR FILTER REGULATOR	1	STANDARD
18	POSITION INDICATOR	1	STANDARD
19	FASTENERS	1	HT STEEL/SS

Dimensional Table

Rating :150 Class

SIZE (NB)	L+3	L1+1	D1+2	D+2	H1+8	H2+8	A	B	C	I
50 mm	51	43	50	92	122	110				
65 mm	54	46	65	105	112	122				
80 mm	54	46	75	127	120	130				
100 mm	60	52	100	157	130	150				
125 mm	64	56	125	185	165	215				
150 mm	64	56	150	216	190	250				
200 mm	70	60	200	270	200	290				
250 mm	80	68	250	323	250	315				
300mm	90	78	300	380	295	385				
350mm	90	78	350	412	335	420				
400mm	114	102	400	470	365	450				
450mm	130	114	450	534	400	490				
500mm	143	127	500	585	435	580				
600mm	170	154	598	705	518	715				

Dimensions may vary as per actuator make & models & will be provided with offer drawing as per customer requirement.

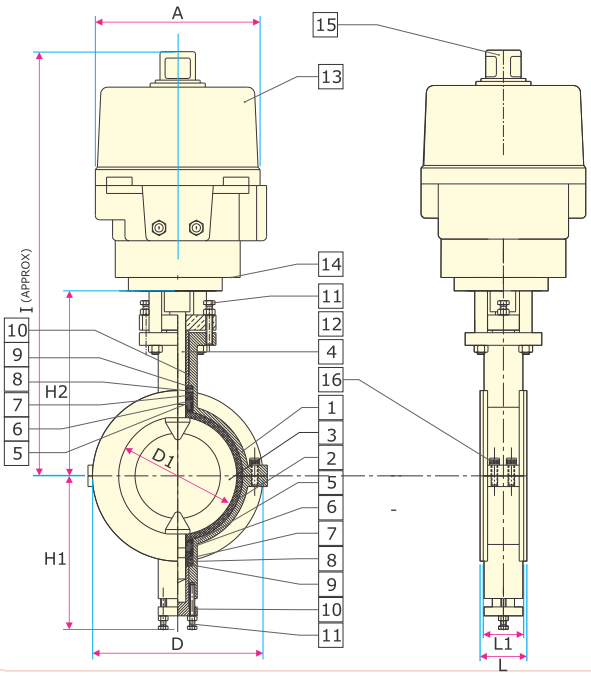
HYDRO TEST PRESSURE:
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

Notes:

1. **Manufacturing Standards**
   Design : API 609 - Wafer Type
   Face To Face Dimension: API 609 Category 'A'
   Connection Rating : ANSI B 16.5; 150#;
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Make Of Actuators**
   EL-O-MATIC, ROTEX, I-TORQUE
5. **Operation Control**
   A). On-off (NO or NC) Control
   B). Proportional Control with E.P. Positioner
6. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED BUTTERFLY VALVE

ELECTRICALLY ACTUATED



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	2	CS / SS EPOXY PAINTED
2	SEAT	1	PTFE
3	DISC	1	SS 304 INSERTED
			PPH/PVDF/PFA/FEP LINED
4	STEM	1	SS 304 + PPH/PVDF/PFA/FEP
			LINED INTEGRAL TO DISC
5	STEM SEAL - TOP & BOTTOM	2	PTFE
6	SEAL CUP - TOP & BOTTOM	2	PPH/PVDF/PFA/FEP
7	TEE BUSH - TOP & BOTTOM	1	SS-304

NO.	DESCRIPTION	QTY.	MATERIAL
8	DISC SPRING - TOP & BOTTOM	2	50 Crv 4
9	THRUST WASHER - TOP & BOTTOM	2	SS 304
10	THRUST COLLAR - TOP & BOTTOM	2	STEEL/SS
11	ADJUSTABLE BOLTS	1	SS/STEEL PLATED
12	LOCK PLATE (FOR TOP SEAL)	1	CAST IRON
13	ELECTRICAL ACTUATOR	1	ALUMINIUM ALLOY
14	MANUAL OVERRIDE	1	STANDARD INBUILT
15	POSITION INDICATOR	1	STANDARD
16	FASTENERS	1	HT STEEL/SS

Dimensional Table

Rating :150 Class

SIZE (NB)	L+3	L1+1	D1+2	D+2	H1+8	H2+8	A	B	I
50 mm	51	43	50	92	122	110			
65 mm	54	46	65	105	132	122			
80 mm	54	46	75	127	140	130			
100 mm	60	52	100	157	150	150			
125 mm	64	56	125	185	165	215			
150 mm	64	56	150	216	190	250			
200 mm	70	60	200	270	200	290			
250 mm	80	68	250	323	250	315			
300mm	90	78	300	380	295	385			
350mm	90	78	350	412	335	420			
400mm	114	102	400	470	365	450			
450mm	130	114	450	534	400	490			
500mm	143	127	500	585	435	580			
600mm	170	154	598	705	518	715			

Dimensions may vary as per actuator make & models & will be provided with offer drawing as per customer requirement.

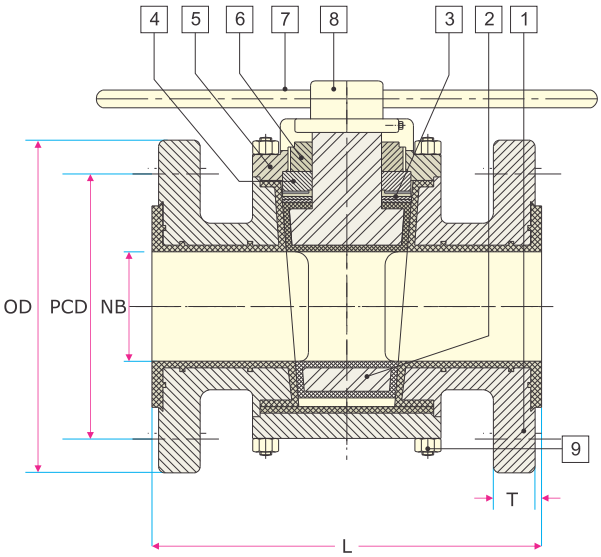
HYDRO TEST PRESSURE:
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

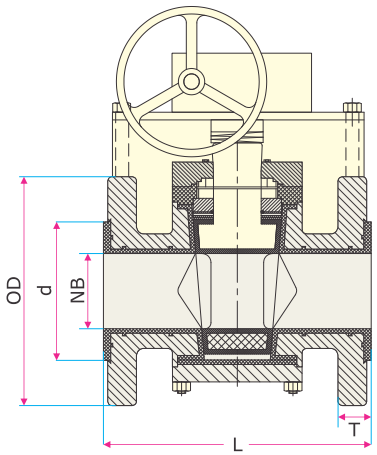
Notes:

1. **Manufacturing Standards**
   Design : API 609 - Wafer Type
   Face To Face Dimension: API 609 Category 'A'
   Connection Rating : ANSI B 16.5; 150#;
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Make Of Actuators**
   BELIMO, MARSH, I-TORQUE
5. **Operation Control**
   A). On-off (NO or NC) Control
   B). Modulating Control
6. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED PLUG VALVE

WRENCH OPERATED





Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	ASTM A 216 GR. WCB/ DI+3 MM
			THK PFA/FEP LINED ON ALL
			WETTED PARTS, RAISED FACES
			LINING THICKNESS: 3mm
2	PLUG	1	CF8 + PFA LINED (3 MM THK.)
3	DIAPHRAGM	1	PTFE
4	THRUST COLLAR	1	PTFE
5	COVER PLATE	1	CS/ DI
6	ADJESTING NUT	—	CF 8
7	HANDLE ROD	—	MS
8	HANDLE CAP	1	MS
9	FASTENERS	1	SS 304

Note: For Size 150 MM and above gear operation

HYDRO PRESSURE:
15mm TO 100mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	OD	d	T
15 mm	108	89	35	11
20 mm	118	98	43	13
25 mm	127	108	51	14
40 mm	165	127	73	17
50 mm	178	152	92	19
80 mm	203	190	127	24
100 mm	229	229	157	24
150 mm	267	280	216	25
200 mm	297	343	268	30

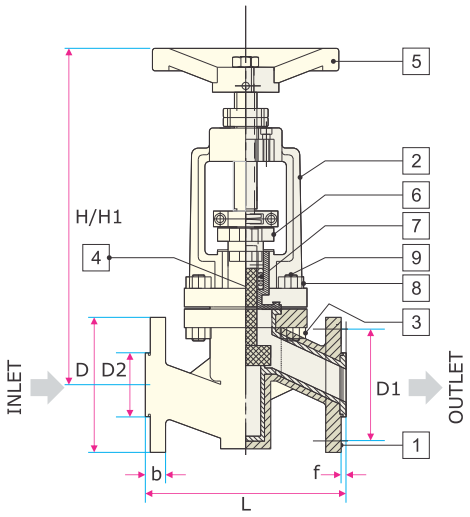
PCD as per ANSI B 16.5 Standard, 150#

Notes:

1. **Manufacturing Standards**
   Design : BS EN 17292 (BS 5351) Short Pattern
   Face To Face Dimension: ANSI B 16.10
   Flange Connection : ANSI B 16.5; 150#;RF
   Test Standard : ISO 9393-2/API 598/ BS EN 12266-1:2003
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED GLOBE VALVE

STRAIGHT TYPE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	WCB A216+PFA LINED
			LINING THICKNESS: 3mm
2	BONNET	1	CS+PFA LINED
3	PLUG	1	AISI 410+ PFA LINED
4	STEM	1	AISI 410+ PFA LINED
5	HANDWHEEL	1	CS/CI
6	GLAND COVER	1	CS/MS
7	GLAND	1	PTFE
8	NUT	—	HT STEEL PLATED
9	STUD	1	HT STEEL PLATED

HYDRO PRESSURE:
15mm TO 100mm
BODY : 15 Kg/Cm^2
SEAT : 11 Kg/Cm^2

125mm TO 200mm
BODY : 9 Kg/Cm^2
SEAT : 7 Kg/Cm^2

Dimensional Table

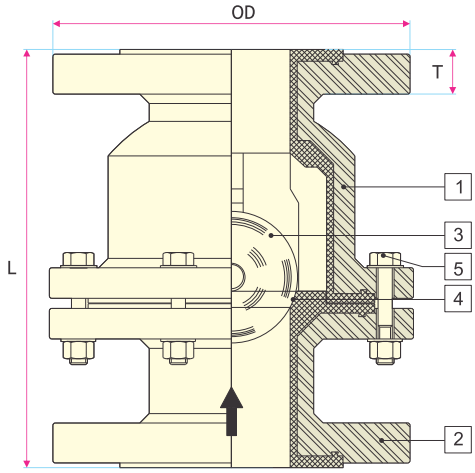
DN	D	D1	D2	L	b	f	H/H1	Z-ØD
15	95	60	35	130	12	3	240/265	4-Ø15
20	105	70	43	150	12	3	240/265	4-Ø15
25	108	79.5	51	160	12.5	3	270/295	4-Ø15
32	117	89	64	180	18	3	277/302	4-Ø15
40	129	98	73	200	18	3	337/372	4-Ø15
50	152	121	92	230	18	3	352/392	4-Ø19
65	178	140	105	290	20	3	390/427	4-Ø19
80	190	152.5	127	310	22	3	425/465	4-Ø19
100	229	191	157	350	24	3	460/503	4-Ø19
125	254	216	186	400	26	3	507/565	8-Ø22
150	279	241	216	480	28	3	560/625	8-Ø22
200	343	298	270	495	30	3	670/745	8-Ø22

PCD as per ANSI B 16.5 Standard, 150#

Notes:

1. **Manufacturing Standards**
   Design : EN 13397 : 2002 (BS 5156)
   Face To Face Dimension: EN-558-1 Series 1
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED BALL CHECK VALVE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS/SS + 3 mm THK.
			PPH/PVDF / FEP/ PFA LINING
2	END PIECE	1	CS / SS + 3 mm THK.
			PPH/PVDF / FEP/ PFA LINING
3	BALL	1	SOLID PTFE
4	SEAT	1	INTEGRAL PVDF / FEP/ PFA
5	FASTENERS	—	SS-304 / STEEL PLATED

HYDRO TEST PRESSURE:

UPTO 80 NB; BODY : 15 Kg/Cm^2
SEAT : 10 Kg/Cm^2

FOR 100 NB
BODY : 10 Kg/Cm^2
SEAT : 10 Kg/Cm^2

ABOVE 100 NB
BODY : 6 Kg/Cm^2
SEAT : 6 Kg/Cm^2

Dimensional Table

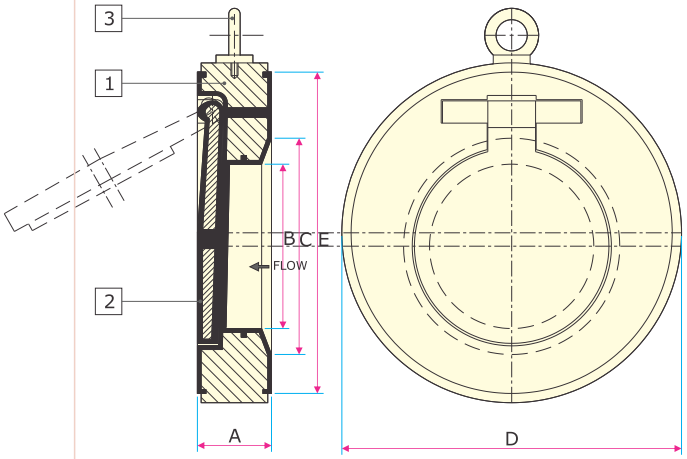
Rating :150 Class

SIZE (NB)	L±3	OD	T
25 mm	127	108	17
40 mm	165	127	17
50 mm	178	152	19
80 mm	203	191	23
100 mm	229	230	23
150 mm	303	280	25
200mm	421	343	28

Notes:

1. **Manufacturing Standards**
   Design : Manufacturer's Standard
   Face To Face Dimension: ANSI B 16.10 upto 100NB size, above 100NB size, Manufacturer's Standard
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED SWING CHECK VALVE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS / SS + 3 mm THK. PPH/PVDF / FEP/ PFA LINING
2	FLAP	1	CS / SS + 3 mm THK. PPH/PVDF / FEP/ PFA LINING
3	EYE-HOOK	1	STEEL PLATED

HYDRO TEST PRESSURE:
BODY : 18 Kg/Cm^2
SEAT : 13 Kg/Cm^2

Dimensional Table

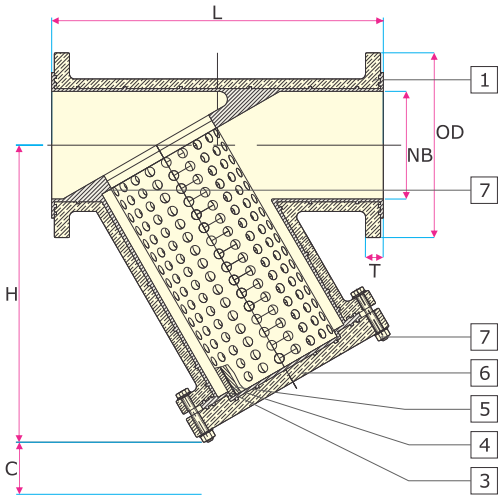
Rating :150 Class

SIZE (NB)	A±3	B	C	D	E
80 mm	46	44	60	134	127
100 mm	52	65	80	171	152
150 mm	56	111	128	217	207
200 mm	60	133	175	274	260
250 mm	68	184	224	335	317
300 mm	78	232	272	405	377
350 mm	88	245	285	445	410

Notes:

1. **Manufacturing Standards**
   Design : Manufacturer's Standard
   Face To Face Dimension: Manufacturer's Standard
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED 'Y' TYPE STRAINER



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	SHELL	1	CI / DI + 3 mm THK. PVDF / FEP/ PFA LINING
2	SEAT	1	INTEGRAL PVDF / FEP/ PFA
3	OUTER TUBE	1	PTFE
4	FILTER WEB	1	ETFE - MESH SIZE 40
5	INNER TUBE	1	PTFE
6	SHELL COVER	1	CI / DI + PVDF/FEP/PFA LINED
7	FASTENERS	—	SS / STEEL PLATED

HYDRO TEST PRESSURE:
BODY : 10 Kg/Cm^2

Dimensional Table

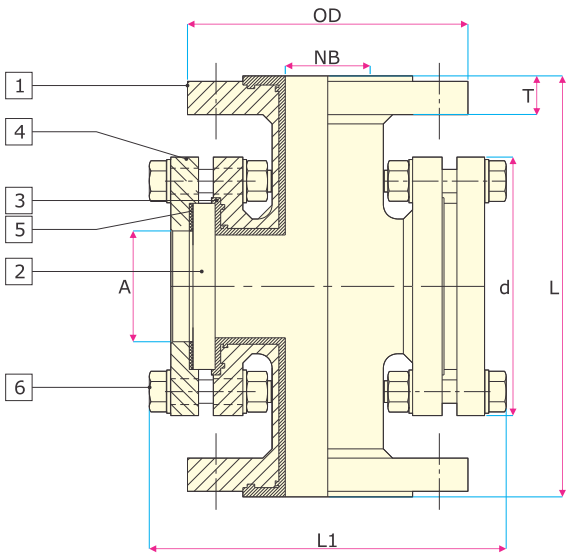
Rating :150 Class

SIZE (NB)	L±5	OD	H	T
25 mm	190	108	128	17
40 mm	265	127	240	17
50 mm	284	152	203	19
65 mm	320	178	240	22
80 mm	350	191	250	23
100 mm	415	230	310	23
150 mm	520	280	388	25
200 mm	605	343	585	26

Notes:

1. **Manufacturing Standards**
   Design : Manufacturer's Standard
   Face To Face Dimension: Manufacturer's Standard
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   DI : ASTM A 395
   CI : GRADED CASTING

LINED DOUBLE WINDOW SIGHT GLASS



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS / SS + PPH/PVDF / PFA /
			FEP LINED LINING THK: 3mm
2	GLASS	2	TOUGHENED BOROSILICATE
3	SEAT	2	INTEGRAL PVDF/FEP/PFA/PPH
4	COVER FLANGE	2	CS/SS
5	GLASS PACKING	2	PTFE
7	FASTENERS	—	SS/STEEL PLATED

HYDRO TEST PRESSURE:
UPTO 80 NB; BODY : 10 Kg/Cm^2

FOR 100 NB & ABOVE
BODY : 5 Kg/Cm^2

Dimensional Table

Rating :150 Class

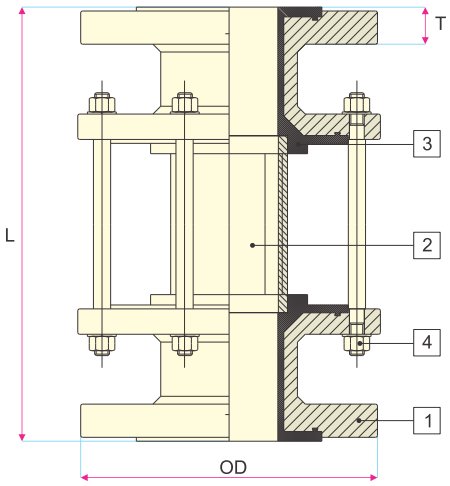
SIZE (NB)	L±3	OD	T	L1	d	A
25 mm	178	108	17	130	85	30
40 mm	204	127	17	150	110	45
50 mm	228	152	19	170	135	60
65 mm	254	178	20	200	155	75
80 mm	280	191	23	220	175	90
100 mm	330	228	23	260	205	110
125 mm	380	254	25	290	225	135
150mm	406	280	25	340	250	175
200mm	458	343	28	400	315	225

Notes:

1. **Manufacturing Standards**
   Design : Manufacturer's Standard
   Face To Face Dimension: Manufacturer's Standard
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED SIGHT GLASS

FULL VIEW TYPE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	END PIECE	2	CS / SS + 3 mm THK. PPH/PVDF / FEP/ PFA LINING
2	GLASS TUBE	1	BOROSIL
3	SEAT	2	INTEGRAL PPH/PVDF / FEP/ PFA
4	FASTENERS	—	SS-304 / STEEL PLATED

HYDRO TEST PRESSURE:
UPTO 80 NB; BODY : 10 Kg/Cm^2

FOR 100 NB & ABOVE
BODY : 5 Kg/Cm^2

Dimensional Table

Rating :150 Class

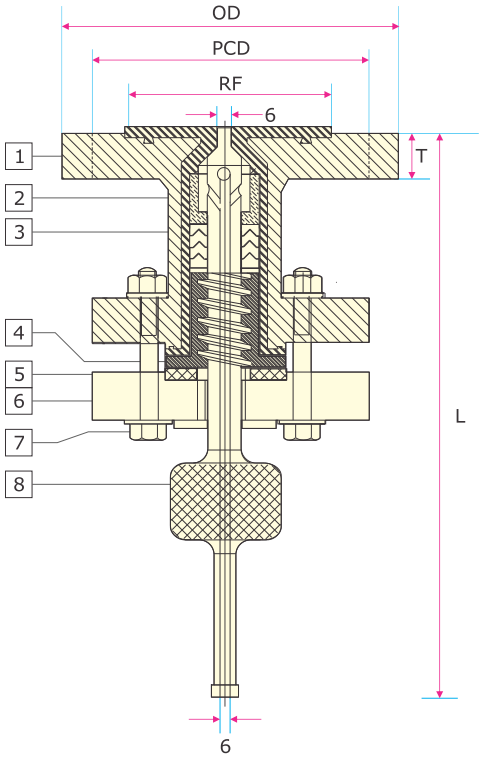
SIZE (NB)	L±3	OD	T
25 mm	162	108	17
40 mm	180	127	17
50 mm	212	153	19
80 mm	258	191	23
100 mm	298	230	23
150 mm	375	280	29

Notes:

1. **Manufacturing Standards**
   Design : Manufacturer's Standard
   Face To Face Dimension: Manufacturer's Standard
2. **Spark Test**
   15 KVDC
3. **Standard Resin Specifications For Lining**
   PTFE : ASTM D 1457
   PVDF : ASTM D 3222
   PFA : ASTM D 3307
   FEP : ASTM D 2116
4. **Material**
   CS : ASTM A 216 GR. WCB
   SS : ASTM A 351 CF 8/ASTM A 351 CF8 M

LINED SAMPLING VALVE

FLANGED TYPE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS/SS + PFA / EFP / PVDF / PPH LINED
2	MATERIAL PORT	1	PTFE
3	CHEVORN PACKING	1	PTFE
4	SOCKET	1	PTFE
5	LOCK PLATE	1	SS 304
6	COMPANION FLANGE	1	SS 304
7	FASTNERS	–	SS 304
8	SPINDLE	–	PTFE

HYDRO TEST PRESSURE:
BODY : 5 Kg/Cm^2
SEAT : 5 Kg/Cm^2

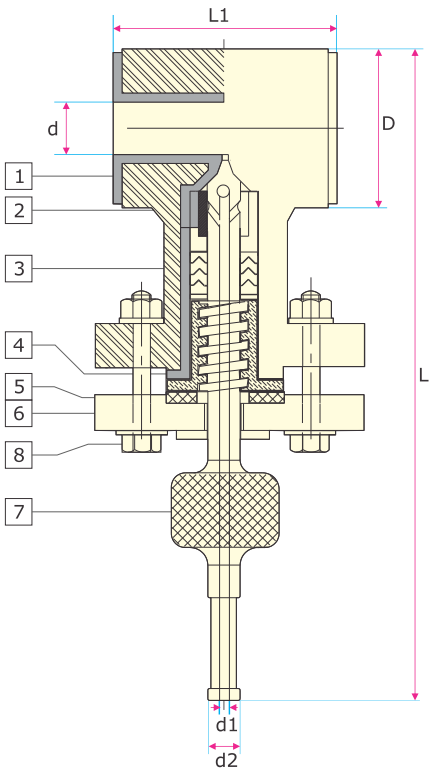
Dimensional Table

Rating :150 Class

SIZE (NB) DIA	L±3	OD	T	RF	PCD	NO. OF HOLES	HOLE
25 mm	200	108	15	51	79	04	16

LINED SAMPLING VALVE

SANDWICH TYPE



Material Specification

NO.	DESCRIPTION	QTY.	MATERIAL
1	BODY	1	CS/SS + PFA / EFP / PVDF / PPH LINED
2	MATERIAL PORT	1	PTFE
3	CHEVORN PACKIGN	1	PTFE
4	SOCKET	1	PTFE
5	LOCK PLATE	1	SS 304
6	COMPANION FLANGE	1	SS 304
7	SPINDLE	–	PTFE
8	FASTNERS	–	SS 304

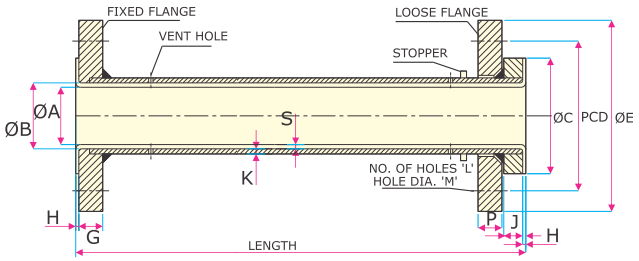
HYDRO TEST PRESSURE:
BODY : 5 Kg/Cm^2
SEAT : 5 Kg/Cm^2

Dimensional Table

Rating :150 Class

SIZE (NB)	L±3	L1	D	d	d1	d2
25 mm	210	60	62	20	6	18

LINED PIPE



Dimensional Table

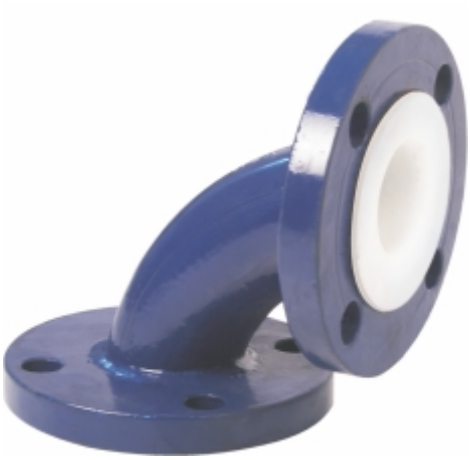
Rating :150 Class

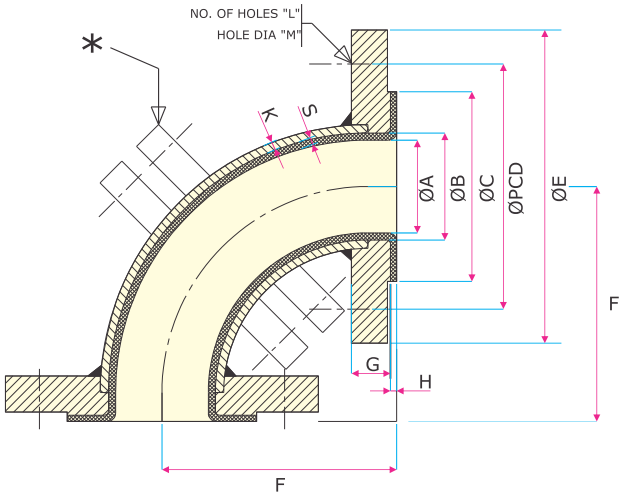
SIZE (NB)	øA ±1	øB	øC	PCD	øE	G	NO. OF HOLES	HOLE DIA	PIPE THK. K	LINER THK. S	FACE THK. H
15mm	14	21	34.9	60.3	88.9	11.1	4	15.9	2.9	4	2.4
20mm	19.6	26.6	42.7	69.8	98.4	12.7	4	15.9	3.4	4	2.4
25mm	19.6	26.6	50.8	79.4	108	14.2	4	15.9	3.4	4	2.4
32mm	28.1	35.1	63.5	88.9	117.5	15.8	4	15.9	3.6	4	2.4
40mm	33.9	40.9	73	98.4	127	17.5	4	15.9	3.7	4	2.4
50mm	45.5	52.5	92.1	120.7	152.4	19.1	4	19	3.9	4	2.4
65mm	55.7	62.7	104.8	139.7	177.8	22.2	4	19	5.2	4	2.4
80mm	70.9	77.9	127	152.4	190.5	23.8	4	19	5.5	4	2.4
100mm	95.3	102.3	157.2	190.5	228.6	23.8	8	19	6	4	2.4
125mm	119.2	128.2	185.7	215.9	254	23.8	8	22.2	6.6	5	3.8
150mm	145.1	154.1	215.9	241.3	279.4	25.4	8	22.2	7.1	5	3.8
200mm*	197.4	206.4	269.9	298.5	342.9	28.6	8	22.2	6.35	5	3.8
250mm*	249.3	260.3	323.9	362	406.4	30.2	12	25.4	6.35	6	4
300mm*	300.1	311.1	381	431.8	482.6	31.8	12	25.4	6.35	6	4
350mm*	328.7	339.7	412.8	476.3	533.4	34.9	12	28.6	7.92	6	4
400mm*	379.5	390.5	469.9	539.8	596.9	36.5	16	28.6	7.92	6	4
450mm*	429.3	441.3	533.4	577.9	635	39.7	16	31.8	7.92	6.5	4.4
500mm*	475.9	488.9	584.2	635	698.5	42.9	20	32	9.52	7	4.8
600mm*	575.9	590.5	692.2	749.3	812.6	47.6	20	35	9.52	8	5.6
700mm	685.1	692.1	801.6	863.6	827.1	50	28	35	9.52	4	2.4
800mm	786.7	793.7	916.2	977.9	1060.4	50	28	41.3	9.52	4	2.4

SPECIFICATIONS:

1. **ALL DIMENSIONS ARE IN MM**
2. **PIPE**
   - i). ANSI B. 36.10, ASTM A 106 GR. B SCH.40 UPTO 150 NB, 200 NB TO 600 NB MIN SCH.20* & 700 NB ONWARDS STD. SCH.
   - ii). 450 & ABOVE SCH. PIPE AS ABOVE OR WELDED CONSTRUCTION FROM IS 2062 PLATES WITH (SPOT X- RAY.)
3. **FLANGE** : ANSI B. 16.5, ASA 150#, IS 2022 GR. A.
4. **LINER** : ASTM D 1457TYPE - III PTFE/ 700 NB ONWARDS PTFE WELDED LINER
5. **STANDARD MAX. LENGTH OF PIPE** 3000 MM
6. **THE TOLERANCES ON LENGTH OF PIPE** +/- 3.2
7. **LINING & OTHER DIMENSIONAL TOLERANCES** AS PER ASTM A 1545-98 / ASTM D 1457 TYPE III
8. **OTHER SPECIFICATIONS / DIMENSIONS / VACUUM SERVICE AVAILABLE ON REQUEST**
9. **P= G- 2MM; J= 0.8 G**

LINED ELBOW 90°





Dimensional Table

Rating :150 Class

SIZE (NB)	øA ±1	øB	øC	F1	F	PCD	øE	G	NO. OF HOLES	HOLE DIA	PIPE THK. K	LINER THK. S	FACE THK. H
15mm	14	21	34.9	44	89	60.3	88.9	11.1	4	15.9	2.9	4	2.4
20mm	19.6	26.6	42.7	44	89	69.8	98.4	12.7	4	15.9	3.4	4	2.4
25mm	19.6	26.6	50.8	44	89	79.4	108	14.2	4	15.9	3.4	4	2.4
32mm	28.1	35.1	63.5	51	95	88.9	117.5	15.8	4	15.9	3.6	4	2.4
40mm	33.9	40.9	73	57	102	98.4	127	17.5	4	15.9	3.7	4	2.4
50mm	45.5	52.5	92.1	63	114	120.7	152.4	19.1	4	19	3.9	4	2.4
65mm	55.7	62.7	104.8	76	127	139.7	177.8	22.2	4	19	5.2	4	2.4
80mm	70.9	77.9	127	76	140	152.4	190.5	23.8	4	19	5.5	4	2.4
100mm	95.3	102.3	157.2	102	165	190.5	228.6	23.8	8	19	6	4	2.4
125mm	119.2	128.2	185.7	114	190	215.9	254	23.8	8	22.2	6.6	5	3.8
150mm	145.1	154.1	215.9	127	203(305)*	241.3	279.4	25.4	8	22.2	7.1	5	3.8
200mm	197.4	206.4	269.9	140	229(338)*	298.5	342.9	28.6	8	22.2	6.35	5	3.8
250mm	249.3	260.3	323.9	165	(419)*	362	406.4	30.2	12	25.4	6.35	6	4
300mm	300.1	311.1	381	190	(483)*	431.8	482.6	31.8	12	25.4	6.35	6	4
350mm	328.7	339.7	412.8	226	(546)*	476.3	533.4	34.9	12	28.6	7.92	6	4
400mm	379.5	390.5	469.9	253	(610)*	539.8	596.9	36.5	16	28.6	7.92	6	4
450mm	429.3	441.3	533.4	279	(673)**	577.9	635	39.7	16	31.8	7.92	6.5	4.4
500mm	475.9	488.9	584.2	305*	(737)**	635	698.5	42.9	20	32	9.52	7	4.8
600mm	575.9	590.5	692.2	358*	(864)***	749.3	812.6	47.6	20	35	9.52	8	5.6

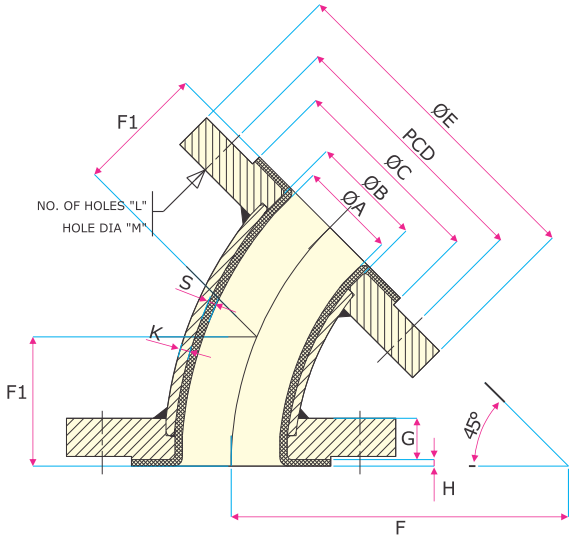
SPECIFICATIONS:

1. ALL DIMENSIONS ARE IN MM
2. MATERIAL OF CONSTRUCTION:
   - ELBOW BODY : ASTM A 234 Gr. WPB
   - FLANGE : ANSI B. 16.5,ASA 150#, IS 2002.
   - LINER : ASTM D 1457 TYPE III, PTFE

*- In Two Piece Construction

**- In Three Piece Construction

LINED ELBOW 45°



Dimensional Table

Rating :150 Class

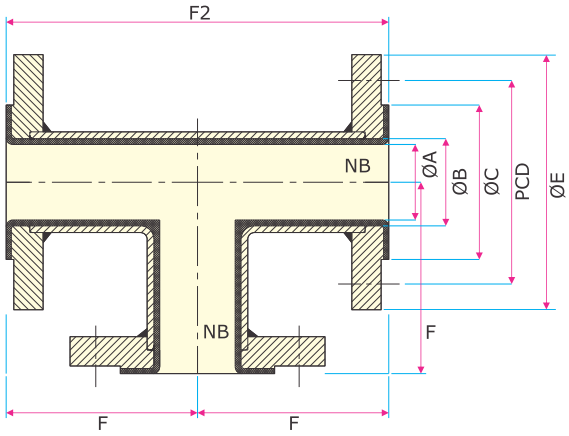
SIZE (NB)	øA ±1	øB	øC	F1	F	PCD	øE	G	NO. OF HOLES	HOLE DIA	PIPE THK. K	LINER THK. S	FACE THK. H
15mm	14	21	34.9	44	89	60.3	88.9	11.1	4	15.9	2.9	4	2.4
20mm	19.6	26.6	42.7	44	89	69.8	98.4	12.7	4	15.9	3.4	4	2.4
25mm	19.6	26.6	50.8	44	89	79.4	108	14.2	4	15.9	3.4	4	2.4
32mm	28.1	35.1	63.5	51	95	88.9	117.5	15.8	4	15.9	3.6	4	2.4
40mm	33.9	40.9	73	57	102	98.4	127	17.5	4	15.9	3.7	4	2.4
50mm	45.5	52.5	92.1	63	114	120.7	152.4	19.1	4	19	3.9	4	2.4
65mm	55.7	62.7	104.8	76	127	139.7	177.8	22.2	4	19	5.2	4	2.4
80mm	70.9	77.9	127	76	140	152.4	190.5	23.8	4	19	5.5	4	2.4
100mm	95.3	102.3	157.2	102	165	190.5	228.6	23.8	8	19	6	4	2.4
125mm	119.2	128.2	185.7	114	190	215.9	254	23.8	8	22.2	6.6	5	3.8
150mm	145.1	154.1	215.9	127	203(305)*	241.3	279.4	25.4	8	22.2	7.1	5	3.8
200mm	197.4	206.4	269.9	140	229(338)*	298.5	342.9	28.6	8	22.2	6.35	5	3.8
250mm	249.3	260.3	323.9	165	(419)*	362	406.4	30.2	12	25.4	6.35	6	4
300mm	300.1	311.1	381	190	(483)*	431.8	482.6	31.8	12	25.4	6.35	6	4
350mm	328.7	339.7	412.8	226	(546)*	476.3	533.4	34.9	12	28.6	7.92	6	4
400mm	379.5	390.5	469.9	253	(610)*	539.8	596.9	36.5	16	28.6	7.92	6	4
450mm	429.3	441.3	533.4	279	(673)**	577.9	635	39.7	16	31.8	7.92	6.5	4.4
500mm	475.9	488.9	584.2	305*	(737)**	635	698.5	42.9	20	32	9.52	7	4.8
600mm	575.9	590.5	692.2	358*	(864)***	749.3	812.6	47.6	20	35	9.52	8	5.6

SPECIFICATIONS:

1. ALL DIMENSIONS ARE IN MM
2. MATERIAL OF CONSTRUCTION:
   - ELBOW BODY : ASTM A 234 Gr. WPB
   - FLANGE : ANSI B. 16.5,ASA 150#, IS 2002.
   - LINER : ASTM D 1457 TYPE III, PTFE

*- In Two Piece Construction
**- In Three Piece Construction

LINED EQUAL TEE



Dimensional Table

Rating :150 Class

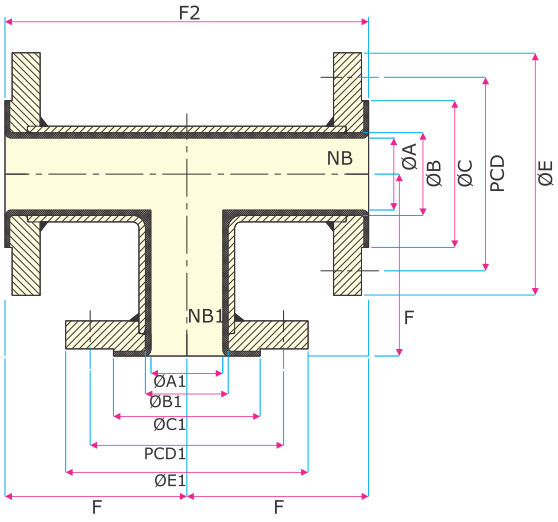
NB	F	F2
20mm	89	178
25mm	89	178
32mm	95	190
40mm	102	204
50mm	114	228
65mm	127	254
80mm	140	280
100mm	165	330
125mm	190	380
150mm	203	406
200mm	229	458
250mm	279	558
300mm	305	610
350mm	356	712
400mm	378	756
500mm	457	914
600mm	559	1118

SPECIFICATIONS:

1. **ALL DIMENSIONS ARE IN MM**
2. **FOR OTHER DIMENSIONS PLEASE SEE "LINED PIPE" PAGE**
3. **MATERIAL OF CONSTRUCTION :**

EQUAL TEE: EQUAL CROSS BODY (PIPE) :
ANSI B 36.10; ASTM A 216 Gr. WCB/ ASTM A 106 Gr. B
FLANGE :
ANSI B. 16.5,ASA 150#, IS 2002.
LINER :
ASTM D 3307
ASTM D 2116

LINED REDUCING TEE



Dimensional Table

Rating :150 Class

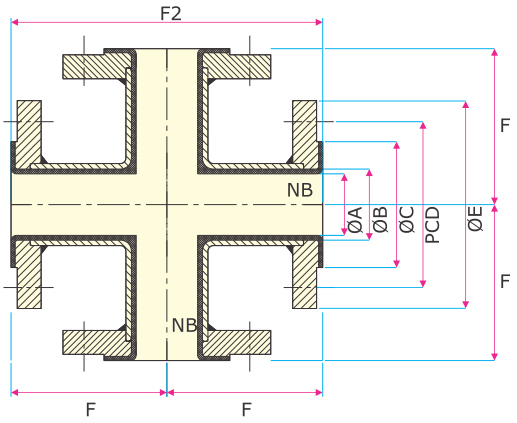
NB	NB1	F	F2
25	20	89	178
32	20/25	95	190
40	25	102	204
50	25/40	114	228
65	40/50	127	254
80	25/50	140	280
100	80	165	330
125	65/80/100	190	380
150	80/100/125	203	406
200	80/100/125/150	229	458
250	100/125/150/200	279	558
300	100/125/150/200/250	305	610
350	100/125/150/200/250	356	712
400	150/200/250/300/350	378	756
500	500	457	914
600	600	559	1118

SPECIFICATIONS:

1. ALL DIMENSIONS ARE IN MM
2. FOR OTHER DIMENSIONS PLEASE SEE "LINED PIPE" PAGE
3. MATERIAL OF CONSTRUCTION :

EQUAL TEE; EQUAL CROSS BODY (PIPE) :
ANSI B 36.10; ASTM A 216 Gr. WCB/ASTM A 106 Gr. B
FLANGE :
ANSI B. 16.5,ASA 150#, IS 2002.
LINER :
ASTM D 3307
ASTM D 2116

LINED EQUAL CROSS



Dimensional Table

Rating :150 Class

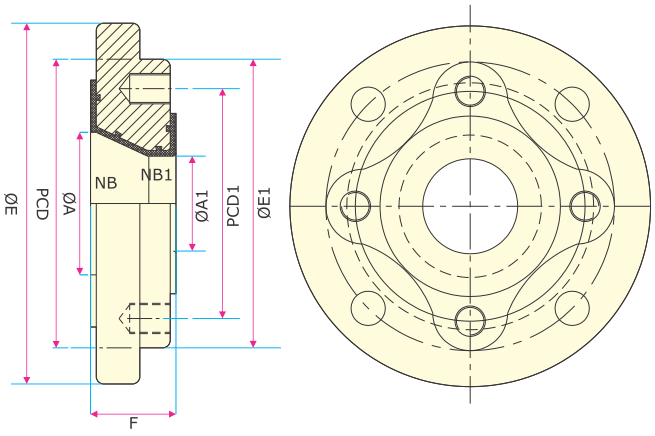
NB	F	F2
25	-	-
32	95	190
40	102	204
50	114	228
65	127	254
80	140	280
100	165	330
125	190	380
150	203	406
200	229	458

SPECIFICATIONS:

1. **ALL DIMENSIONS ARE IN MM**
2. **FOR OTHER DIMENSIONS PLEASE SEE "LINED PIPE" PAGE**
3. **MATERIAL OF CONSTRUCTION :**

EQUAL TEE; EQUAL CROSS BODY (PIPE) :
ANSI B 36.10; ASTM A 216 Gr. WCB/ ASTM A 106 Gr. B
FLANGE :
ANSI B. 16.5,ASA 150#, IS 2002.
LINER :
ASTM D 3307
ASTM D 2116

LINED REDUCING FLANGE



Dimensional Table

Rating :150 Class

NB	NB1	F
20	15	35
25	20	35
25	15	35
32	25	35
32	20	35
40	32	35
40	20	35
50	40	35
50	32	35
50	25	35
50	20	35
65	50	35
65	40	35
65	20	35
80	65	45
80	50	45
80	40	45
80	25	45
100	80	45
100	65	45
100	50	45
100	40	45
100	25	45
25	100	45
125	80	45

Dimensional Table

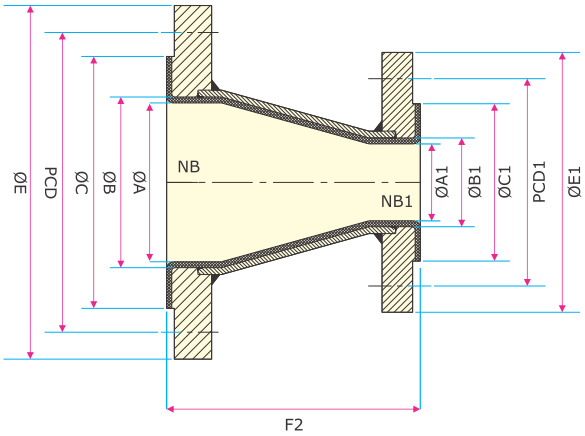
NB	NB1	F
125	50	45
150	125	54
150	100	54
150	80	54
200	150	54
200	125	54
200	100	54
200	80	54
200	50	54
250	200	54
250	150	54
250	100	54
250	80	54
300	250	54
300	200	54
300	100	54
350	300	60
350	200	60
300	100	60

SPECIFICATIONS:

1. ALL DIMENSIONS ARE IN MM
2. FOR OTHER DIMENSIONS PLEASE SEE "LINED PIPE" PAGE
3. MATERIAL OF CONSTRUCTION :

REDUCING FLANGES & REDUCERS :
ANSI B 36.10; ASTM A 216 Gr. WCB/ASTM A 106 Gr. B
FLANGE :
ANSI B. 16.5,ASA 150#, IS 2002.
LINER :
ASTM D 3307
ASTM D 2116

LINED REDUCER



Dimensional Table

Rating :150 Class

NB	NB1	F2
25	20	114
32	25/20	114
40	15/25	114
50	40/25	127
65	50/40	127
80	50/40	152
100	80/50/25	178
125	100/80	203
150	125/100	229
200	150	279
250	200	305
300	250	356

SPECIFICATIONS:
1. ALL DIMENSIONS ARE IN MM
2. FOR OTHER DIMENSIONS PLEASE SEE "LINED PIPE" PAGE
3. MATERIAL OF CONSTRUCTION :
   REDUCING FLANGES & REDUCERS :
   ANSI B 36.10; ASTM A 216 Gr. WCB/ASTM A 106 Gr. B
   FLANGE :
   ANSI B. 16.5,ASA 150#, IS 2002.
   LINER :
   ASTM D 3307
   ASTM D 2116

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Jayshree Chemicals Ltd	Orissa
Kanoria Chemicals Ltd	Renukoot
Meghmani Finechem Ltd	Dahej
Nirma Limited	Bhavnagar
NRC Limited	Sahad
Punjab Alkalies & Chemical Ltd	Naya Nangal
Reliance Industries Ltd (IPCL)	Dahej
United Phosphorus Ltd (Unit 5)	Jhagadia
Shriram Alkalies and Chemical ltd	Jhagadia
Shriram Vinyl & Chemicals Ltd	Kota
Siel Chemical Complex	Rajpura
Sree Rayalseema Alkalies & Chemicals Ltd	Kurnool
Tamilnadu Petroproducts Ltd	Chennai
Tata Chemicals Ltd	Mithapur
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Hindustan Zinc Ltd	Debari
ISPAT Industries Ltd	Kalmeshwar
Jaghadia Copper Ltd	Jaghadia
JSW Ltd	Vasind
Jindal Iron & Steel Co Ltd	Tarapur
JSW Ltd	Hissar
Lloyds Steel Industries Ltd	Wardha
NMDC ltd	Visakhapatanam
Panchmahal Steel Ltd	Halol
Nicomet Industries Ltd	Mumbai & Goa
Steel Authority of India Ltd	Bokaro
Steel Authority of India Ltd	Salem
Steelco Gujarat Ltd	Palej
SWIL Ltd	Jhagadia
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KTI Ltd	New Delhi
Multiform Machinery Bombay Pvt Ltd	Mumbai
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SNC Lavlin Assosiates	Mumbai
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Transpek Industry Ltd	Baroda
The Dharmi Morarjis Chemical Ltd	Anbarnath
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