



FluorolinedTM
Equipment Pvt.Ltd.

"The answer to Corrosion"



Precision Engineered | Reliable | Economical

About Company

Fluorolined Equipment Pvt.Ltd. is a leading manufacturer of centrifugal chemical Process pumps in specialized Fluoropolymers for handling of various corrosive liquids. The company has been serving nearly 80 % of Indian steel industry and other chemical industry since last a decade. We serve a wide range of sizes of pumps in solid injection molded PVDF material as well in vertical submersible pumps.

Introduction of PVDF

The fluorinated polymers are widely appreciated for their remarkable chemical inertness and their excellent resistance to aging.

Polyvinylidene Fluoride (PVDF) offer the specific advantages of easy processing in accordance with all the convention methods used in the plastic industry. PVDF, polymerized, according to its own special process, offer a high degree of crystallinity to the that by other processes, resulting among other things in superior thermo-mechanical properties.

The intrinsic technical superiority is one of the reasons for the success of which PVDF has achieved on the world market for more than 20 years

But nothing is possible without a genuine quality assurance policy which Fluorolined Equipment follows with their efforts for Total Quality Management over their products & services.

Special Properties of PVDF

- Resistance to most chemicals & solvents
- High thermal stability
- Mechanical strength at elevated temperature
- High purity
- High abrasion resistance
- Resistance to sunlight
- Resistance to nuclear radiation
- Low flame & smoke characteristics
- Resistance to fungus
- Low permeability to most gases & liquids
- Readily processible, formable & weldable
- Cold weather impact strength

Advantages

- Tried & tested chemical process pump design for rough condition.
- Thick walled vacuum-proof PVDF housing in one piece.
- Therefore no additional sealing points in the pump housing.
- PVDF casing liner completely encapsulated in strong cast iron Casing Armour.
- Replaceable PVDF Casing liner-reduces the maintenance cost.
- Pipe line forces are absorbed by Cast Iron Armour.
- Also suitable for high system pressure.
- Flanges with through holes meeting the requirement of the chemical industries.
- Semi-open PVDF impeller reinforced by large metal insert Smooth running & long service life of mechanical seals, thanks to the particularly heavy duty bearing pedestal.
- Modular system ensuring economical parts stocking.
- Available in 1440 as well as 2900rpm.
- Flow rate up to 400m³/hr. Head upto- 100 mts.
- Back pull out design ease of maintenance.
- Available in 20 models with maximum interchangeability.
- External corrosion protection of pumps & base frames by an epoxy paints.
- Each pump is tested at our computerized test bench.
- A performance test report is submitted with each pump.
- Faster deliveries and Cost effective.
- Consulting & servicing by specialists.
- Sales & services network all over India.



IMPELLER

All impellers are semi-open type having contoured flow passages for Maximum efficiency.



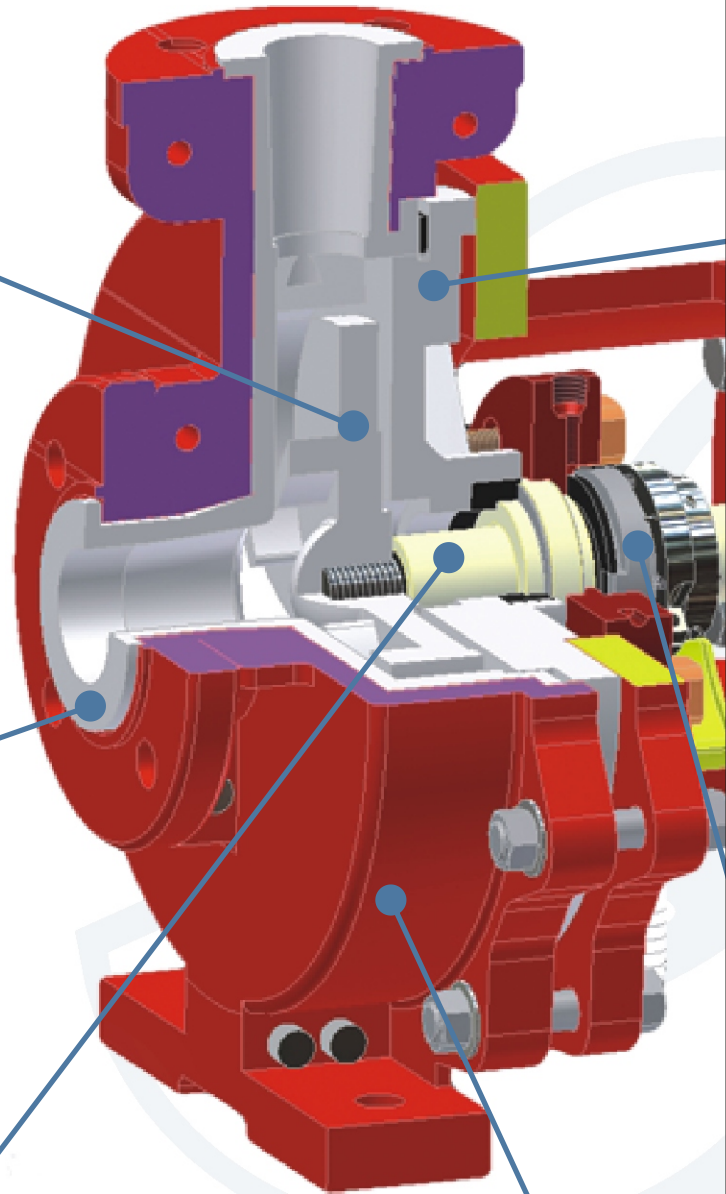
CASING LINER

Top centerline discharge, self venting volute casing formed out of solid injection molded PVDF.



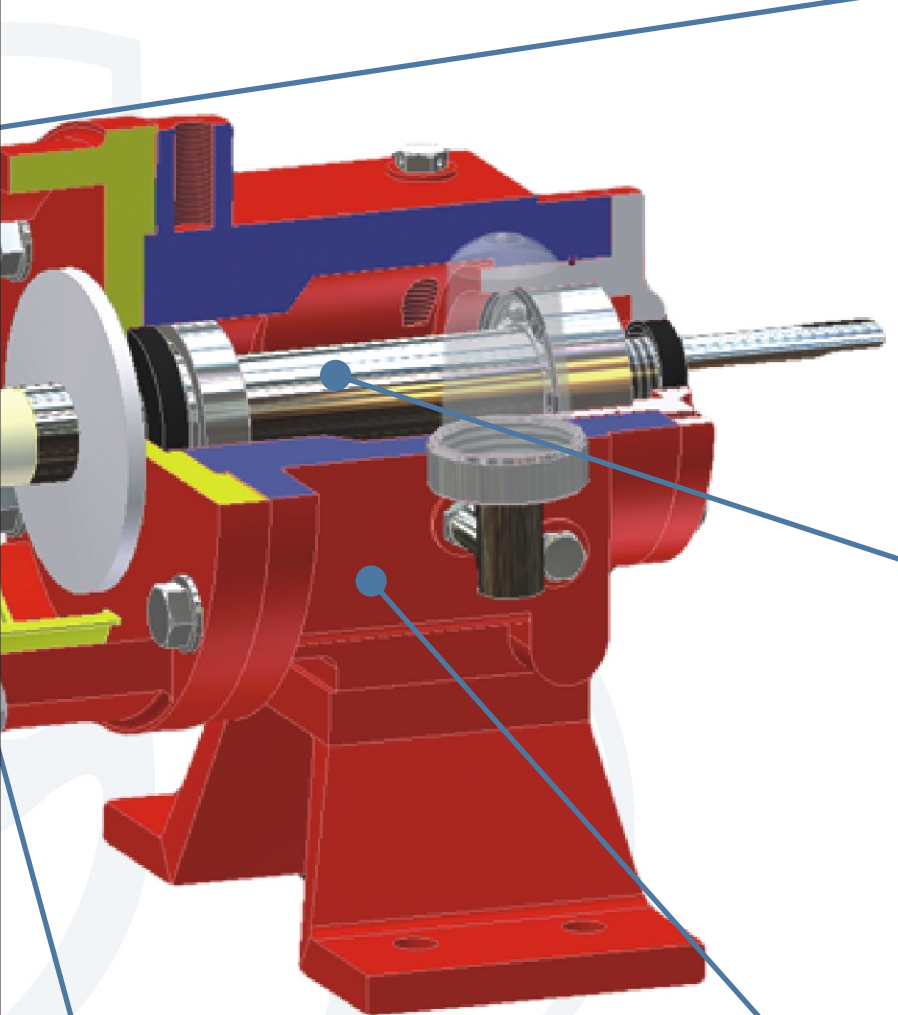
SHAFT SLEEVE

Shaft sleeve of high corrosion resistant materials are used for maximum compatibility with the liquid.



CASING ARMOUR

Heavy cast iron armour is encapsulated on the casing liner for maximum mechanical strength.



BACK PLATE

Thick walled solid injection molded PVDF.



SHAFT

Shaft of EN series / Stainless steel material is provided having maximum 0.5mm deflection at mechanical seal.



MECHANICAL SEAL

Mechanical seal/ Gland pack arrangements of different systems or makes are provided depending on the

BEARING HOUSING

Sturdy cast iron construction provide rigid bearing alignment and shaft support, contains large oil reservoir, oil level is maintained by constant oil leveler with visible oil supply.

No compromise with aggressive media : Fluorolined heavy-duty Process Pumps overcome difficult condition!

Technical features

The development of the heavy-duty series PVDF is based on long-term experiences with the proven KLCP series. Compared to the KLCP series the very strong shaft design is the substantial construction feature of the PVDF series, but, together with this improvement further important components were designed to supply even more operational safety.

The special stable-bearing pedestal ensures smooth running even in case of difficult applications and thus optimum pre-conditions for a long lifetime of the mechanical shaft seal.

Referring to the shaft deflection, this robust design provides the pre-conditions to meet international standards, especially in case of heavy load e.g. starting against open discharge valve, minimum flow rates, maximum impeller diameters and high density.

Leakage losses and wear and tear of the rotary seal rings are kept to a minimum due to the low shaft deflection. The wetted contact/liner material PVDF permit applications with all aggressive, corrosive or toxic media. By means of their sturdy design with solid PVDF housing completely encapsulated in outer metal armour, they combine the chemical and thermal resistance of the liner material with the mechanical strength of the outer metal armour.

Casing Liner and Back Plate

- Thick walled casing liner and back plate is made of PVDF
- Replaceable casing liner
- Standard shell of cast iron
- Casing Liner and Back Plate are solid injection moulded

Impeller

- Semi-open impeller
- A large metal insert in the PVDF impeller greatly increases mechanical strength

Shaft Sleeve

- Design is matched to the shaft seal mounting.
- Non-metallic: - 99.7% Oxide Ceramic Al_2O_3 (High Alumina Ceramic) & Silicon Carbide.
- Metallic: Hastalloy-B/C, Alloy 20, Titanium.

Shaft Seal

- Single mechanical shaft seal of various systems & makes are available.
- Stuffing boxes and a large range of accessories.

Bearing Pedestal

- Particularly rigid shaft of high - strength Stainless Steel / EN-8 / EN-19 / EN - 24 / EN-41.
- Double row ball bearing with extremely high load capacity.
- Long life oil lubricated bearings on both the sides

Gaskets

- Envelope Gasket (Casing Gasket) is of PTFE with EPDM rubber insert to ensure maximum sealing. All other gaskets are of PTFE.

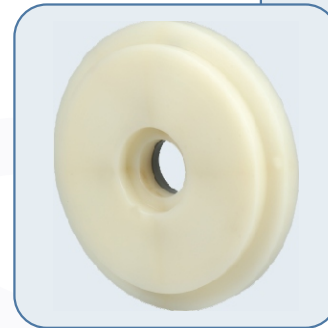
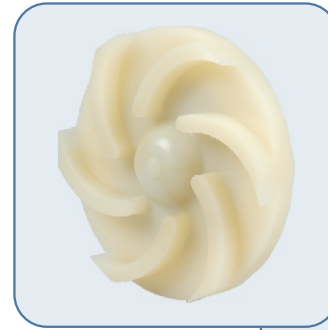
Temperature Ranges

- In practice, the theoretical maximum temperature specified by the plastic manufacturers cannot be utilized in the case of heavy-duty hydraulically optimized pump components. Thanks to the encompassing metal armour and the generously dimensioned metal impeller core, the PVDF used in Fluorolined Pumps can be stressed to a relatively high extent without becoming mechanically over loaded.

Performance Range

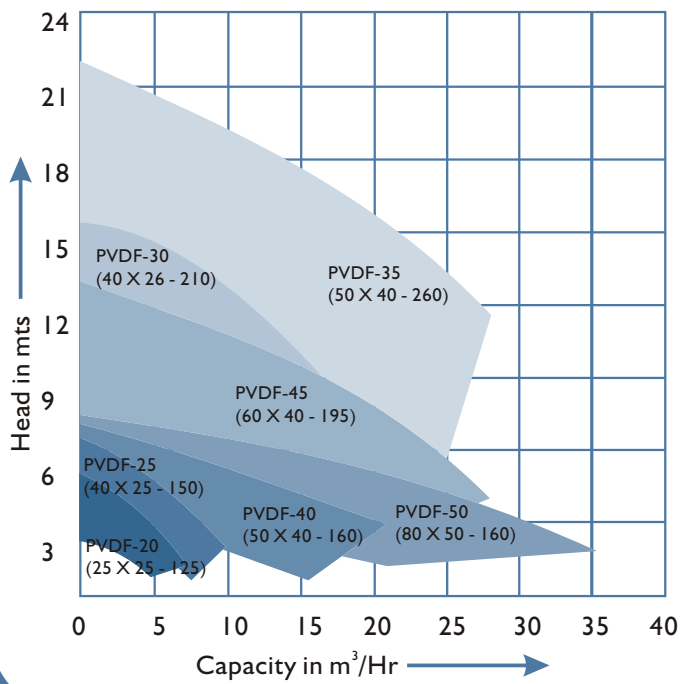
- Flow rate up to 400 m³/hr.
- Head up to 100mts of liquid column.

PVDF Series-I (1.375")

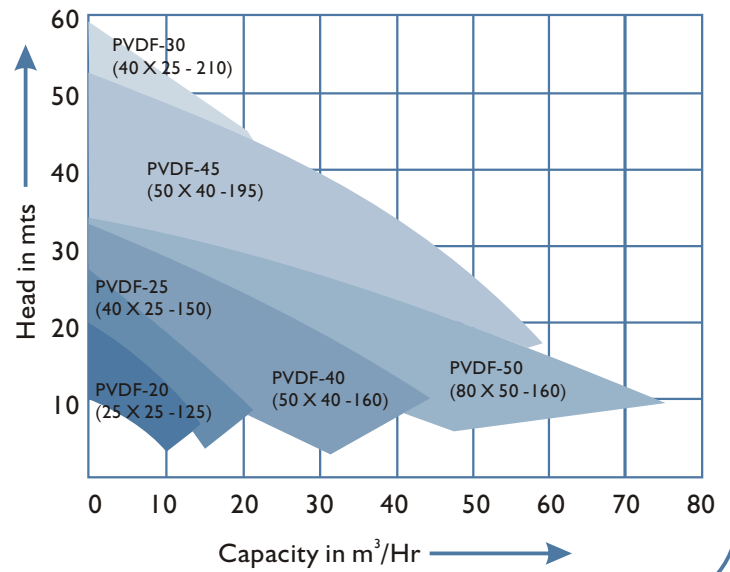


Performance Curves

PVDF Series-I (1.375") Characteristic Curves at 1440 RPM



PVDF Series-I (1.375") Characteristic Curves at 2900 RPM



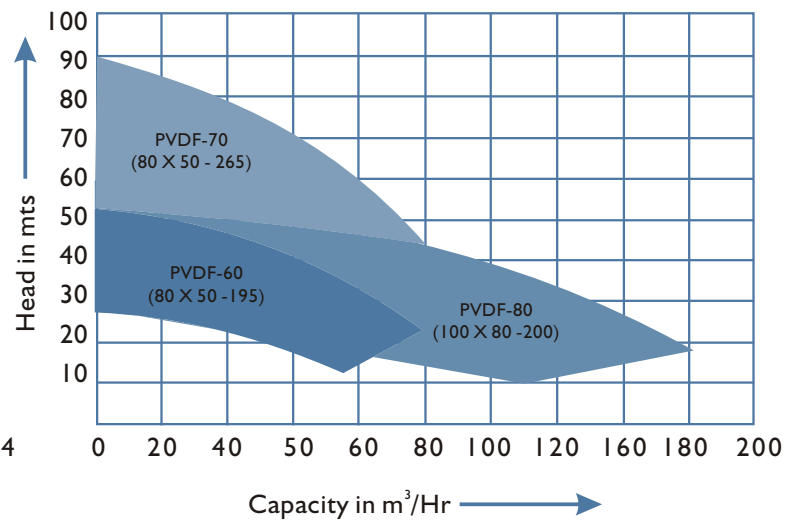
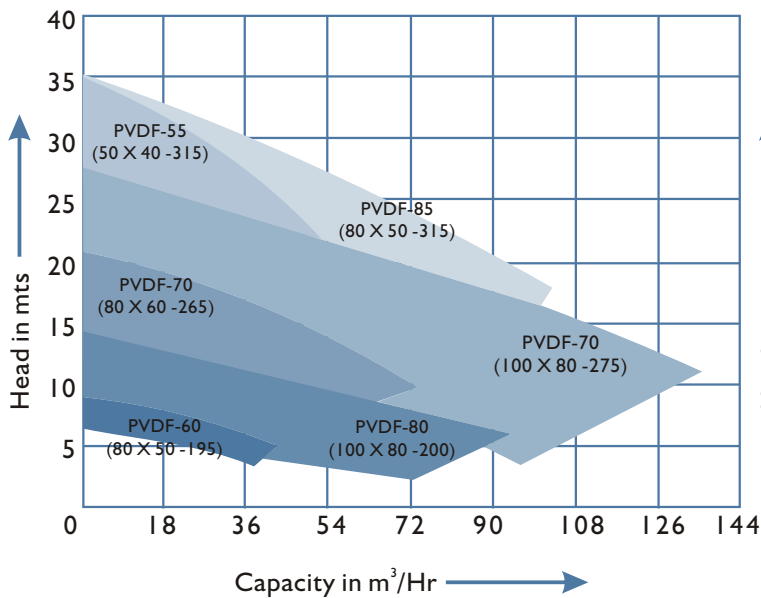
PVDF Series-II (1.875")



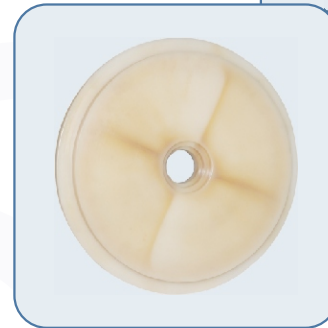
Performance Curves

PVDF Series-II(1.875") Characteristic Curves at 1440 RPM

PVDF Series-II(1.875") Characteristic Curves at 2900 RPM

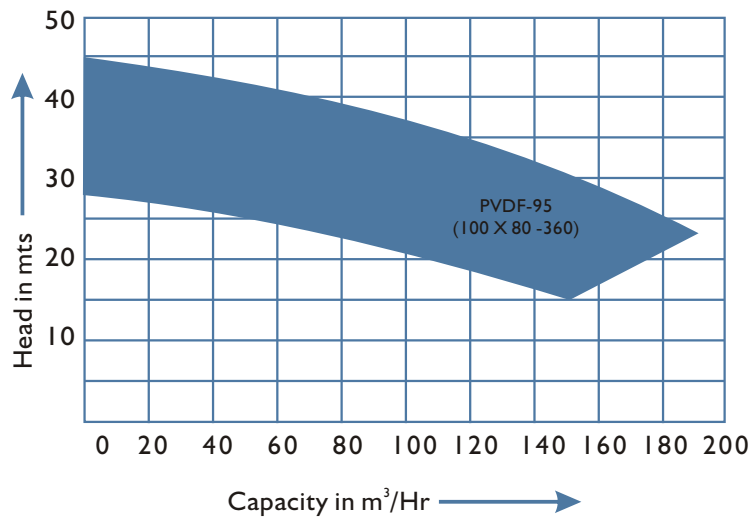


PVDF Series-III (2.125")



Performance Curves

PVDF Series-III(2.125") Characteristic Curves at 1440 RPM



Series IV

- High Capacity Pumps for large capacity chemical/metal industry.
- Details available only on request.

Industries Served

Steel Pickling Plants

- Pickling Acid Recirculation, Rinse recirculation Spent/waste acid transfer, fresh acid transfer.

Acid Regeneration Plants

- Concentrated Waste Pickle Liquor, Pickle Liquor, and fresh acid transfer.

Pesticide /& Insecticide Plants

- Various kind of toxic & hazard chemicals with or without slurries.

Caustic Chlorine Plants

- HCl Loading/unloading, chloride destruction, anolyte blowdown, drying tower.

Dyes and Intermediates Plants

- Acidic chemicals with slurries, filter press application.

Pharmaceutical and Bulk Drug

- pure to slightly contaminated, toxic, explosive or environmentally harmful media such as acids, alkalis and solvents.

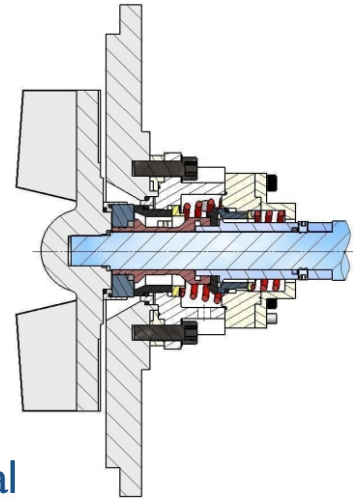
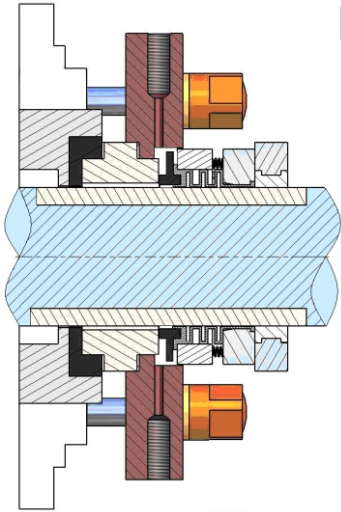
Environmental

- Industrial waste water treatment (ETP), Scrubber recirculation.

Shaft Sealing Flexibility

Double Mechanical Seal

- Balanced Double Mechanical Seal
- Springs are product protected
- Cartridge Assembly-Easy for installation
- Ideally suitable for Corrosive Chemicals with Abrasive slurry



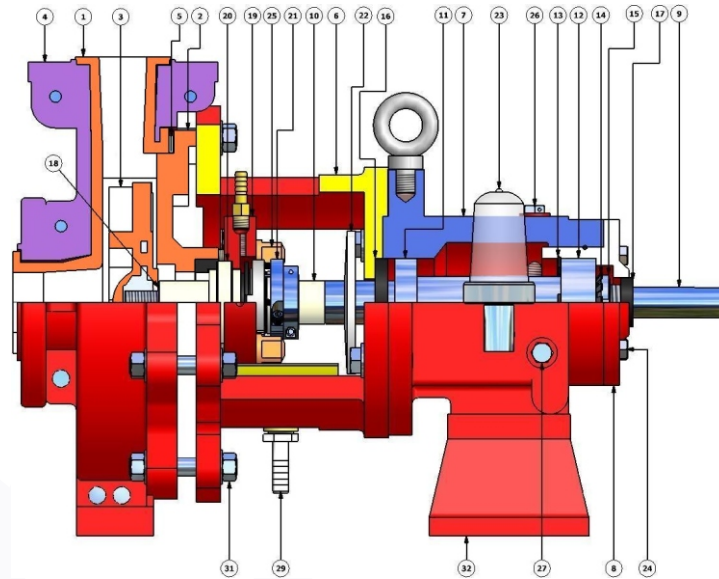
Single Mechanical Seal

- Single outside mounted mechanical seal
- Teflon bellow
- Rotary face is of GFT / Replaceable & Reversible Silicon Carbide
- Stationary face is of Ceramic/Silicon carbide External flushing provided for longer life

		Series - I								Series - II								Series - III			Series - IV	
		PVDF								PVDF								PVDF			PVDF	
		20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	150	
Mould Thickness	Casing	7	7	7	9	7	8	9	11	10	11	12	16	12	12	12	15	13	13	13	13	
	Impeller	15	15	13	15	15	15	15	15	15	19	15	18	17	17	18	19	15	15	20	20	
	Threading for Impeller	12	13	13	12	13	13	13	14	14	19	14	20	14	16	14	15	14	14	16	16	
Shaft	Back Plate	3/4" UNF								1" UNF								1 1/4" UNF			1 1/2" UNF	
	Dia. Under Sleeve	21.9								31.9								35.9			47.4	
	Dia. at Bearing Span	43								63								72			75	
	Dia. at coupling	25								42								45			55	
	Overhang	215								248								307			240	
	Max. Shaft Deflection	0.05								0.05								0.05			0.05	
Shaft Sleeve	Dia. Outside	34.925								47.625								53.975			63.5	
	Dia. Inside	22								32								36			47.5	
Bearings	Radial	SKF-6207								SKF - 6310								SKF - 6311			SKF - 6313	
	Thrust	ZKL-3306								ZKL - 3310								ZKL - 3311			ZKL - 3313	
	Bearing Span	120								165								205			150	
Mech. Seal	Stationary Unit	1.375"								1.875"								2.125"			2.5"	
	Rotary Unit	1.375"								1.875"								2.125"			2.5"	
Oil Seal	In / Out Board	35 X 72 X 10 / 25 X 40 X 40								50 X 80 X 10 / 42 X 60 X 10								55 X 80 X 10 / 45 X 60 X 10			65 X 90 X 10 / 55 X 70 X 10	
Clearance	Casing / Impeller	1-2								2-3								2-3			2-3	
	Impeller / Back Plate	3-4								3-5								3-5			3-5	

Construction Details (All dimensions are in mm.)

Cross Sectional Drawing



Parts List

Sr. No.	Part Name	M.O.C.	Sr. No.	Part Name	M.O.C.
1	Casing Liner	PVDF	*17	Oil Seal	NEOPRE NE
2	BackPlate	PVDF	*18	"O" Ring	NEOPRE NE
*3	Impeller	PVDF	19	Locating Flange	HYLAM
4	Casing Armour	C.I.	*20	Stationary Unit of Mech. Seal	Ceramic / Sic
*5	Envelope Gasket	C.I.	*21	Rotary Unit of Mech. Seal	GFT / Sic
6	Adaptor	C.I.	22	Deflector	Polypropylene
7	Bearing Block	C.I.	23	Constant Oil Leveler	Polycarbonate
8	Bearing Cover	C.I.	24	Hardware	Steel
*9	Shaft	EN 19 / EN 41 / SS 316	25	Bolt for Clamping Mech. Seal	SS With PP Nut
*#10	Shaft Sleeve	Ceramic	26	Oil Breather	Steel
11	Ball Bearing (Inboard)	SKF - 6207/6310/6311/6313	27	Oil Drain Plug	Steel
12	Ball Bearing (Outboard)	ZKL - 6306/3310/6311/3313	28	Coupling**	C.I.
13	Circlip	Spring Steel	29	Drip Tray	Poly Propylene
14	Star Washer	Steel	30	Base Plate**	M.S. Fabricated
15	Locknut	Steel	31	Casing Hardware	S.S.
*16	Oil Seal	Neoprene	32	Bearing Block Leg	C.I.

Different Sleeve material available for different fluids - SiC/ HAST-B/ ALLOY20/TITANIUM

* Parts normally stocked for emergency repairs.

** Parts not shown in Cross Sectional view

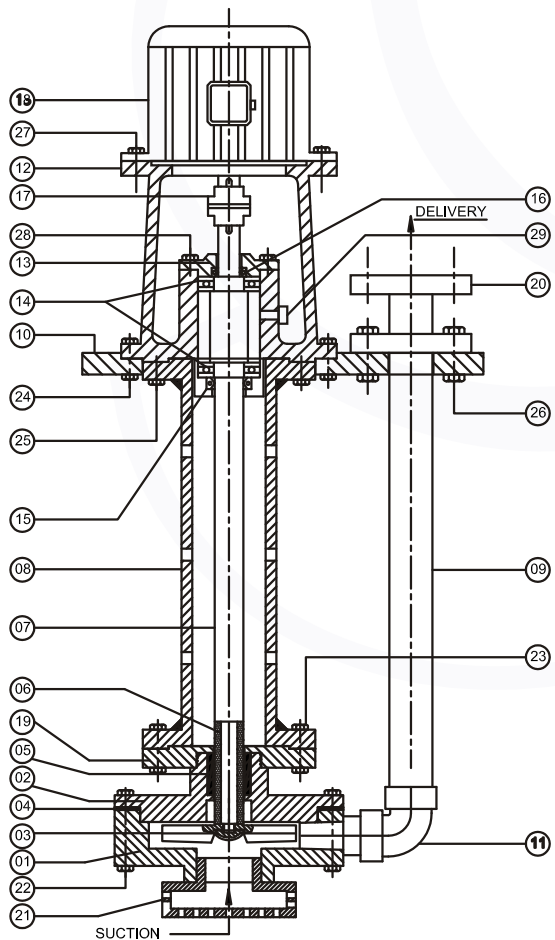
Modular Interchangeability Chart

Pump Model/Size (Suct. dia X Del.dia X Imp. dia.) in mm	Casing Armour with Liner	Impeller	Stuffing box (Backplate)	Adaptor	Shaft, Bearing block & Leg Assembly	Group / Series
PVDF20 (25 X 25 X 125)						
PVDF25 (40 X 25 X 150)						Series - I
PVDF30 (40 X 25 X 210)						
PVDF35 (50 X 40 X 260)						
PVDF40 (50 X 40 X 195)						
PVDF45 (50 X 40 X 160)						
PVDF50 (80 X 50 X 160)						
PVDF55 (50 X 40 X 315)						Series - II
PVDF60 (80 X 50 X 195)						
PVDF65 (80 X 50 X 230)						
PVDF70 (80 X 50 X 265)						
PVDF75 (100 X 80 X 230)						
PVDF80 (100 X 80 X 200)						
PVDF85 (80 X 50 X 315)						
PVDF90 (100 X 80 X 275)						
PVDF95 (100 X 80 X 350)						Series - III
PVDF100 (150 X 100 X 290)						
PVDF110 (80 X 50 X 400)						
PVDF120 (150 X 125 X 280)						Series - IV
PVDF150 (150 X 125 X 320)						

Vertical Submerged Pump-VSP Series

Heavy Duty Engineered Polypropylene/PVDF Sump-Pump for Primary Effluents/Corrosive Liquids and Scrubbing System:

- Heavy duty design
- Thick walled Volute casing & Back plate
- Semi-open Impeller with large metal insert
- Shaft sealing not required
- Specialized CFT bush bearing at bottom end of shaft to minimize shaft deflection.
- All hard ware are of Polypropylene with metal insert
- Available submerged Length-0.5 mts, 1.0 mts, 1.5 mts, 2.0 mts & 2.5 mts
- Maximum head- 30 mts, Maximum flow-30 m3/hr



*Technical details available on request.

WARANTEECLAUSE: We stand guarantee only the genuinity of PVDF Resin in our pumps but do not stand guarantee for any kind of chemical, physical, & toxicological effects on the same by the liquid handled with our pumps. Since the conditions of handling and use are beyond our control, we make no guarantee of results. We assume no liability for injuries, damages or penalties resulting from its use whether or not our recommendations are followed. Our recommendations are only on the basis of our past experience and should not be taken as guarantee.

Part List For VSP Pumps

No.	Description	M.O.C.	Qty.
1	Volute Casing	POLYPROPYLENE	1 NO.
2	Back Plate	POLYPROPYLENE	1 NO.
3	Impeller	POLYPROPYLENE	1 NO.
4	Cage Ring	POLYPROPYLENE	2 NOS.
5	Back Plate Bush	CARBON FILLED TEFLON	1 NO.
6	Shaft Sleeve	HAST-B/CERAMIC	1 NO.
7	Shaft With HDPE Sleeve	En8 / HDPE	1 NO.
8	Column Pipe	HDPE	1 NO.
9	Discharge Pipe	HDPE	1 NO.
10	Discharge Flange	POLYPROPYLENE	2 NOS.
11	Discharge Elbow	POLYPROPYLENE	1 NO.
12	Elbow Flange	POLYPROPYLENE	1 NO.
13	Pump Support Plate	M.S. with PP LINING	1 NO.
14	Motor Support Stool - Bottom	C.I.	1 NO.
15	Motor Support Stool - Top	C.I.	1 NO.
16	Bearing Cover - Bottom	C.I.	1 NO.
17	Bearing Cover - Top	C.I.	1 NO.
18	Ball Bearing	SKF - 6207	1 NO.
19	Ball Bearing	SKF - 7306	1 NO.
20	Oil Seal (35 X 60 X 10)	NEOPRENE	3 NOS.
21	Oil Seal (25 X 40 X 10)	NEOPRENE	1 NO.
22	Flexible Coupling	C.I.	1 SET
23	Lock Nut	STEEL	2 NOS.
24	Motor		
25	Eye Bolts	STEEL	2 NOS.
26	Back Plate Flange	POLYPROPYLENE	1 NO.
27	Strainer	POLYPROPYLENE	1 NO.
28	Hardwares For Clamping Cage Ring	STEEL / PP	8 NOS.
29	Hardwares For Clamping Casing & Elbow Flange	STEEL / PP	4 NOS.
30	Hardwares For Clamping Column Pipe & Back Plate	STEEL / PP	6 NOS.
31	Hardwares For Clamping Column Pipe & Pump Support Plate	STEEL / PP	6 NOS.
32	Hardwares For Clamping Discharge Pipe Flange	STEEL / PP	4 NOS.
33	Hardwares For Clamping Bearing Cover	STEEL	8 NOS.
34	Hardwares For Clamping Motor & Motor Stool	STEEL	12 NOS.

NOTES:

1. The pumps are available in five standard vertical length : 500mm, 1000mm, 1500mm, 2000mm, 2500mm.
2. At the time of ordering spare parts please specify submerge depth size of the pump.
3. The pump is designed up to 1.5 mts. submerge depth single column pipe and from 2 mts. to 2.5 mts. submerge depth the pump is designed with double column pipe.
4. The submersible depth is measured from the pump support plate.



Works:

Fluorolined Equipment Pvt. Ltd.

Plot No.727 & 728, Phase II, G.I.D.C., Gundlav, India
Phone: +91-2632-236701/329782 Telefax: +91-2632-236464
Website: fluorolined.co.in
Email: factory@fluorolined.co.in

Office:

5, Hind Service Industrial Estate,
Behind Hotel Parkway, Shivaji Park, Mumbai-400028.
Phone: 022-24460630,24460631, 32403208 Fax: 022-24430397
Website: fluorolined.co.in
Email: office@fluorolined.co.in



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