# Fluidtech



# Ennewalten.... Knowledge.... Technology....









#### **OUR PRODUCTS**





- → Ultra High Pressure Pumps
- Pipeline Flushing Pumps
- → Reverse Osmosis Pumps
- → UL/FM Approved Pumps

- → Water Transfer Pumps
- → Chilled Water Pumps
- → Fire Fighting Pumps
- → Self-priming Pumps
- → More...



#### Welcome to Fluidtech

Fluidtech Engineering is an ISO 9001:2008 certified organization. A leading and reliable service provider of fluid engineering products and related services in the MENA region and in the Asia sub-continent.

Fluidtech offers special application pump packages to Marine, Oil & Gas, Petro-Chemical, Power Generation, Civil Construction and General Industries. Our pump product range covers centrifugal type pumps, both end suction and split case. We also offer an extensive range of high and ultra high pressure pump types. Pump units are offered on daily/weekly/monthly rental basis as well as brand new units for out-right purchase. Our pump units are heavy duty, compact and purpose built to last in harsh Middle East environmental conditions.

Our workshop facility covers a total area of some 15000 Sq. ft with tools and equipment for pump skid fabrication, pump set assembly, in-house pump testing and heavy duty engine refurbishment. The most advanced technical facilities with a full-fledged inventory system and of course a highly skilled workforce allowing us to offer standard and custom made pump packages and pumping systems for our client's project requirements.

Objective: As a local Company we wish to become a market leader in the fluid engineering service industry by offering innovative and reliable products with a value added service at a very competitive price, so as to meet and exceed the customer's expectations. We believe in meeting our clients to discuss their pump requirements, by doing this we know that we can deliver exactly what the client requires.

#### **Business Guidelines**

Innovation: Fluidtech understands the client's requirements and site conditions, which enables us to offer innovative products and service solutions, with a competitive edge to ensure a successful project completion

Knowledge: Our personnel have more than 100+ years of hands on experience in the fluid engineering industry. This in-house experience and knowledge helps us to offer the most acceptable solutions to our clients and it keeps us as one of the preferred service providers in our industry.

**Technology:** Fluidtech offers some of the most advanced systems, tools and accessories to meet and exceed the expectations of our clients, to achieve their project goals. In the area of high and ultra high pressure pumps, automation is the route for increased productivity and operator safety.

Quality: Fluidtech is a quality conscious organization. We are committed to recognize and understand the needs and expectations of our customers. Fluidtech delivers quality products and quality services at a competitive price and on time to achieve customer satisfaction.

**Safety:** Fluidtech will provide and maintain a safe and healthy working environment for it's employees and sub-contractors to ensure a successful project completion without any property damage or personnel injuries. an approved method statement will be followed throughout the project execution and risk analysis reports will be reviewed after each phase of the project.

Relationship: We believe in team work and we will always strive to keep a fruitful and long lasting relationship with our clients. As with any business, our clients, employees and suppliers are our business partners to achieve mutually beneficial goals.



#### Pumps-Sales & Rentals

#### **High Pressure Pumps**

#### → High pressure cleaning pumps

#### → High pressure water jetting pumps

Development, design, build and sales of high pressure positive displacement pump sets in diesel engine or electric motor driven configurations to cater to the requirements of Marine, Oil & Gas, Petro Chemical and General Industrial sectors.

Fluidtech is the authorized distributor of Pratissoli pumps in the GCC, for their range of high pressure triplex plunger pumps, accessories and spares. High pressure pump units are offered as skid mounted or trailer mounted options depending on the site requirement. Pressure ratings of these pumps starts from 50 bar to 1400 bar (725 psi to 20000 psi) and the discharge flows range from 6 lpm to 480 lpm (1.6 US gpm to 126 US gpm). The units are very compact in size and are suitable for most of the industrial cleaning and heavy duty water jetting applications.

Hydro jetting units are available for single gun or double gun operations with unloader valve and dry shut gun system. The dry shut gun configuration prevents dumping water at site while the trigger is released and thus avoiding wastage of water. This is especially important when working inside tanks and enclosed areas.

A range of skid mounted hydro jetting units with experienced hydro jetters and pump technicians are available on hire basis to meet any immediate requirement.

Pump skids can be fitted with chalwyn valve, spark arrestor and battery isolator to meet the semi-hazardous safety standards of oil and gas field applications.

Some of the latest additions to the Pratissoli range of pumps include Piston Pump Series M Line which have been designed to handle drilling fluids, muds, slurries and dense mixtures for a variety of applications in the Mining, Chemical, Oil & Gas Industries. Performances range from 35 lpm to 396 lpm (9.3 US gpm to 105 US gpm) and pressures up to 90 bar (1300 psi).

Recycled Fluid Series Pumps are suitable for charged water with particles size up to 200 micron and up to 20% concentration in the water. Due to the special packings the pump can run dry without any damage for up to 30 minutes. Performances range from 100 lpm to 480 lpm (26 US gpm to 126 US gpm) and pressures up to 250 bar (3600 psi).

Stainless Steel 70 Series version AISI 316L pumps and AISI 420 pumps with performances ranging from 30 lpm to 170 Ipm (8 US gpm to 45 US gpm) and pressures up 250 bar (3600 psi).

Stainless Steel N Series Pumps have duplex ASTM block style manifolds. Performances ranging from 74 lpm to 388 Ipm (19 US gpm to 102 US gpm) and pressures up to 400 bar (5800 psi).

Please contact us for your specific pump performance requirements.

#### **Applications**

- → Marine growth removal
- → Scrabbling of concrete surfaces
- Heat exchanger tube cleaning
- → Drainage cleaning

- → Surface cleaning
- **Boiler cleaning**
- Drill pipe cleaning
- → Tank cleaning



High pressure pump models											
Technical Data	Units	KE 22	SXWA 4	HF 22	KT 16	HF 18	VF 14	SK 20			
Pressure	Bar (psi)	250 (3650)	345 (5000)	400 (5800)	500 (7250)	500 (7250)	800 (11600)	1500 (21750)			
Flow	LPM (US gpm)	37 (10)	15 (4.0)	45 (12)	27 (7.2)	38 (10.1)	23 (6.0)	43 (11.4)			
Prime Mover	KW (HP)	18.4 (25)	9.5 (13)	44 (60)	36.8 (50)	44 (60)	44 (60)	136 (182)			
Skid length	mm	1400	1200	1800	1600	1800	2000	2600			
Width	mm	800	600	1000	800	1000	1100	1800			
Height	mm	1200	1200	1400	1400	1400	1400	1850			
Weight	Kgs	650	400	850	700	850	950	2000			

Note: Please visit www.fluidtecheng.com for the complete range of high pressure pumps and accessories



500 bar diesel driven hydro test pump



800 bar electric driven hydro test pump

#### High pressure pump set features

- → Marine growth removal
- → Scrabbling of concrete surfaces
- → Heat exchanger tube cleaning
- → Drainage cleaning
- → Surface cleaning
- **Boiler cleaning**
- Drill pipe cleaning
- Tank cleaning

#### **Abrasive water jetting**

This is a surface treatment process in which a stream of high pressure water is mixed with abrasive particles which are directed on to the surface to be treated. This method is used to remove paint, metal scales, rust, salt and other contaminants from the surface. The velocity of the water jet along with hardness, density, toughness and particle shape of the abrasives will create a surface profile to provide a suitable surface for painting.

Fluidtech offers high pressure water jetting pump sets with venturi nozzles which are mounted on to the water jetting guns which mixes water with the abrasives. This method is called "wet sand blasting" which offers a pollution free water/abrasive operation.



**Abrasive water** jetting





#### High pressure hydro-testing pumps

Fluidtech offers an extensive range of high pressure triplex plunger pumps with pressure regulating valves and related accessories for pressure testing. These HP pump units are available in skid or trailer mounted versions with diesel engine or electric motor driven options. Units can be operated from 0 to the maximum pressure rating of the pump and is ideal for hydro static pressure testing of cross country pipelines, under water pipelines, pressure vessels and storage tanks.

Hydro-test pump models										
Technical Data	Units	KE 36H	LK 60	TR75	HRK 15.25	HF 22	HF 18	VF 14		
Pressure	Bar (psi)	100 (1450)	160 (2320)	200 (2900)	250 (3600)	400 (5800)	500 (7250)	800 (11600)		
Flow	LPM (US gpm)	100 (26.4)	423 (111)	895 (237)	15 (4.0)	45 (12)	38 (10.1)	23 (6.0)		
Prime Mover	KW (HP)	18.4 (25)	44 (60)	342 (460)	7.5 (10)	44 (60)	44 (60)	44 (60)		
Skid length	mm	1400	1800	3000	700	1800	1800	2000		
Width	mm	800	1000	1500	500	1000	800	1000		
Height	mm	1200	1400	2500	700	1400	1400	1400		
Weight	Kgs	650	850	4500	400	850	700	950		

Note: Other performances available, please contact us for further information



500 bar diesel driven hydro test pump



800 bar electric driven hydro test pump



#### Ultra high pressure hydro-blasting pumps

Fluidtech offers some of the most versatile hydro-blasting pump sets in the market that are easy to operate and simple to maintain. The innovative Advanced Design (AD) fluid head is the proven solution for several different pump performances with cost effective replacement parts, helping to reduce the overall maintenance cost of ultra high pressure plunger pumps.

Fluidtech is the Middle East Distributor of Jetech Inc., USA, who offers an extensive range of triplex and quintuplex plunger pumps from 5000 psi to 50000 psi (350 bar to 3450 bar) discharge pressures with powers ranging from 50 HP to 600 HP (36 Kw to 448 Kw). The 500 HP and 600 HP (373 Kw and 448 Kw) are quintuplex type pumps which are ideally suited when automation of the water jetting process is required.

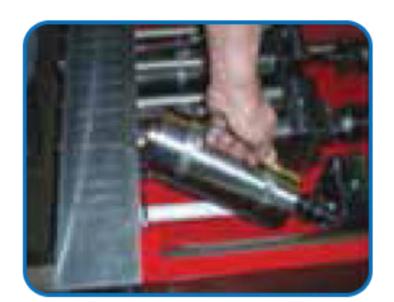
The AD fluid head of the Jetech pumps does not require the pump head to be removed when servicing the plungers or valves. One piece inlet/outlet valve with easy to lift out single bore cylinder assembly illustrating the Jetech pumps exceptional versatility for simple on-site maintenance.

The UHP range of hydro blasting units can be offered as standard or custom made packages with diesel engine or electric motor driven options. The skid mounted and trailer mounted units can be operated as single gun or double gun configurations depending on the site requirement.

Fluidtech are members of the Water Jet Technology Association (WJTA) and through this organization we ensure that we keep up to date with the latest technology in our industry and most importantly health and safety requirements.















40,000 psi Diesel driven twin gun hydro-blasting pump set

Jetech also offer a range of reverse osmosis (RO) pumps from 50 to 700 US gpm (190 to 2660 lpm) at pressures up to 1200 psi (80 bar). The fluidhead is manufactured in duplex stainless steel for long life and durability.

Sub-sea pumps designed by Jetech to run in sea water at depths up to 10000 feet (3050 meters), where the sea water provides the lubrication for the crankshaft & bearings, ie; no polluting oils, with flows from 3.5 to 40 US gpm (13 to 150 Ipm) at pressures from 5000 to 40000 psi (345 to 2760 bar). Please contact us for more information on this innovative range of plunger pumps.



#### Hydro-blasting pump features

- Heavy duty skid mounted triplex and quintuplex plunger pumps
- Diesel driven or electric driven options
- Single cylinder plunger assembly with one piece double acting valve cartridge
- Fewer moving parts compared to many conventional plunger pumps
- Plungers and packings can be serviced individually
- Fluid head does not have to be removed for servicing of plungers and valves
- Easy on-site maintenance
- Most diesel engines with mechanical governors ie; no electronic systems
- In-built diesel tank for 12/24 hours operation
- On-board water tank with low water level safety cut out for pump protection
- Power transmission directly through in-built gear box, models 50 TJ3 to 350 TJ3
- Conversion kits to convert the pump pressures from 5000 psi to 40000 psi (345 bar to 2760 bar)







#### Ultra high pressure pumps - Standard models Model 100 TJ3 150 TJ3 350 TJ3 500 TJ5 100 TJ3 **50 TJ3** 150 TJ3 250 TJ3 Pressure Bar (psi) 1380 (20000 2760 (40000) 1030 (15000) 2070 (30000) 1380 (20000) 1030 (15000) 2070 (30000) 3450 (50000) Flow Ipm (US gpm) 31.3 (8.3) 21.8 (5.8) 26.4 (7.0) 10.7 (2.8) 70.5 (18.6) 95.0 (25.1) 25.4 (6.7) 139 (36.8) Plunger (inches) 5/8 5/8 9/16 15/16 13/16 1.0 7/16) 11/16 Prime Mover Kw (HP) 44 (60) 80 (108) 268 (360) 80 (108) 130 (175) 130 (175) 194 (260) 388 (520) Skid length (mm) 2000 1600 2700 2700 3200 3400 4000 2000 Width (mm) 1200 1400 1800 1800 2200 2400 2400 1400 Height 1800 1800 2000 2000 2500 2600 2800 1800 Weight 1200 1800 3000 3000 4200 5200 6500 1800

Note: please visit www.jetech.com for the complete range of Jetech pumps.

#### **HP & UHP water jetting accessories**

An extensive and reliable selection of water jetting accessories are available for surface preparation and tube bundle cleaning. Water jetting hoses rated from 10000 psi to 46000 psi (690 bar to 3170 bar) working pressures. Dry shut style water jetting gun with un-loader valve, dump style water jetting gun rated from 15000 psi, 20000 psi and 40000 psi (1000 bar, 1400 bar and 2760 bar) working pressures. Complete set of hydro-blasting suits suitable for pressures up to 40000 psi (2760 bar), flow divider valves, high pressure in-line flow meters, UHP accessories such as tumble boxes, external compensation valve (ECV), 40000 psi lances and spares such as seals, back up rings, swivel seals, brass buttons, nozzle carriers, sapphire nozzles etc are available, as well as standard fan and round stream jets.

### Fluidtech

#### **Centrifugal pumps**

A wide range of high volume and high head centrifugal pump sets are available to meet the growing demand from Oil & Gas, Marine, Petro Chemical, Construction and General Industrial sectors. The pump units are offered as standard or custom made packages with diesel engine or electric driven configurations. Flows range from 100 m3/hr to 2400 m3/hr with discharge pressures up to 40 bar.

Pumps complete in stainless steel or bronze construction are available for handling sea water, crude oil and industrial chemicals. The standard materials of construction would be cast iron/ductile iron crank cases with bronze/cast iron impellers with either mechanical seals or soft packed glands. UL/FM approved pumps suitable for construction industry and API approved pumps for oil & gas industry can be o ered at a very competitive price.



Trailer mounted centrifugal pump



Electric driven centrifugal pump



**Self-priming centrifugal pump** 



Diesel driven centrifugal pump on test

#### **Applications**

- → Fluid transfer
- → Pipeline flushing
- Pipeline pigging
- **De-watering**
- → Sewage pumping

- → Storage tanks hydro-testing
- → Pipeline filling
- → Vessel ballasting
- → Stand-by fire pump
- → Bore hole pumping



Centrifugal pumps - Standard models										
Model	ES 80	3HST15	ISO 125x100	150 CS	6HST24	200 CS	250 CS			
Туре	End suction	Split case two stage	End suction	End suction	Split case two stage	Split case	Split case			
Flow (m3/hr)	100	100	200	500	600	800	1200			
Pressure (bar)	8.0	20	12	6	36	8.0	12			
Prime Mover (KW)	44	100	100	150	830	260	600			
Suction (mm)	100	100	125	200	200	200	300			
Discharge (mm)	80	80	100	150	150	200	250			
Skid size (mts)	1.6 x 1.0 x 1.2	2.7 x 1.2 x 1.8	2.25 x 1.1 x 1.8	2.7 x 1.2 x 2.0	4.6 x 3.0 x 2.6	2.9 x 1.2 x 2.2	3.6 x 1.8 x 2.4			
Weight (Kgs)	1000	1600	1400	1800	8500	4500	6500			

#### Centrifugal pump features

- **→** Heavy duty skid or trailer mounted units
- Diesel driven or electric motor driven options
- → End suction & split case models
- → Flow ranges from 50 m3/hr to 2400 m3/hr
- Single stage and multi stage designs

- Discharge pressures up to 40 bar
- → Cast Iron, ductile Iron, bronze and stainless steel pumps
- → UL/FM approved pumps for construction industry
- → Mechanical seals or soft packed glands
- → API approved pumps

#### Marine fire pump package

Fluidtech offers fire-fighting pump packages complete with fire-fighting monitors, foam proportioners etc for supply vessels in the marine industry. Depending on the vessel size, different capacity pumps ranging from Quarter Fi-Fi, Half Fi-Fi, Full Fi-Fi and Super Fi-Fi pumps can be supplied to meet the charter requirement.

ABS/BV/IRS class certified pumps are available with manual or electric remote controlled fire monitors. Pumps can be installed on decks or in the engine room. Based on the space availability on the deck area, compact end suction pumps or split case models can be offered. The pump unit can be containerized depending upon the application. Monitors can be mounted on top of the container to make the fire pump set fully self-contained.

Fire-fighting pump sets are normally supplied with chalwyn automatic air inlet shutdown valve, spark arrestor and batteries mounted in a box with a safety lock - off device



600 m3/hr@12 bar diesel driven Fi-Fi pump set



Half Fi-Fi electric remote controlled are monitor



Marine fire-fighting pumps									
Model	ISO 125 x 100	ISO 200 x 150	ESF 200	200 D	10HS15	ESF 250-600	ESF 300-550		
Flow (m3/hr)	200	600	600	750	1000	1200	1500		
Pressure (bar)	12	6.0	12	8.0	6.0	14	12		
Prime Mover (KW)	100	150	280	240	240	600	690		
Suction (mm)	125	200	200	200	300	350	350		
Discharge (mm)	100	150	150	200	250	250	250		
Skid size (mts)	2.25 x 1.1 x 1.8	2.7 x 1.2 x 1.8	3.0 x 1.5 x 2.4	2.7 x 1.2 x 2.0	3.0 x 1.4 x 2.0	3.6 x 1.8 x 2.4	3.8 x 1.8 x 2.4		
Weight (Kgs)	1400	1800	2000	2200	2400	7500	8000		

#### Mono block and End suction centrifugal pumps

A wide selection of mono block and end suction centrifugal pumps are available for industrial and construction field applications. Close coupled electric motor driven pumps rated from 0.5 HP to 25 HP are in stock for outright purchase.



**Monoblock vertical centrifugal pump** 



Monoblock horizontal centrifugal pump



**End suction centrifugal pump** 

#### **Hot & Cold water pumps**

High pressure cold and hot water pumps are available for general cleaning and many industrial applications. The pump sets can be self-contained or skid mounted, coupled with various types of electric motors or petrol/diesel engines.

The hot water pumps are suitable up to 85 Degree C water temperature. The materials of construction are pump body and cover in die-cast aluminum alloy. Pump shaft in pressed high strength steel. One piece ceramic pistons and pump head in nickel plated brass.



**Cold water wash down pump** 



**Electric** cold water pump



**Hot water pump** 

## Fluidtech

#### Submersible pumps

Fluidtech offers a wide selection of submersible pumps for Civil, Industrial and Municipal sectors. Submersible pumps specially designed for sewage handling, drainage and bore well pumps are available from 0.37 Kw to 350 Kw in 2 and 4 poles. As the name indicates, the complete pump assembly is submerged in the fluid to be pumped which prevents pump cavitation. In the case of submersible pumps, the fluid is pushed to the surface as opposed to standard type surface mounted centrifugal pumps with suction hoses and non-return valves which lifts the fluid to the surface but has a limited suction lift of some 6 to 7 meters.



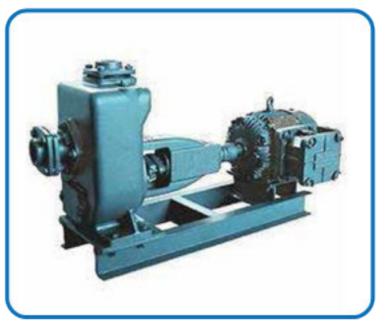
**Bore hole pumps** 



Typical submersible pump

#### **De-watering pumps**

Skid mounted and trailer mounted self-priming de-watering pumps coupled with diesel engine or electric motor are available depending on the site requirement. 4" and 6" models are more readily available as these pump sizes are the industry standard. These pump sets are normally supplied with quick connectors, with re-inforced rubber suction hoses and layflat discharge hoses so the installation at site is quickly achieved.



Electric driven de-watering pumps



Skid mounted de-watering pump set



Trailer mounted de-watering pump set



#### **Pumps - Rental and projects**

Fluidtech is a premier service provider of a wide range of pump sets in the rental market Including split case and end suction centrifugal pumps as well as plunger type high pressure and ultra high pressure pump units.

#### Ultra high pressure hydro-blasting

Ultra high pressure hydro-blasting is the most advanced and environment friendly surface preparation method to date. In UHP hydro-blasting, a highly pressurized stream of water sprays directly on to the surfaces through sapphire nozzles to remove the old paint, rust, salts, chemicals and other contaminants without damaging the original surfaces. While performing water blasting, the ultra high pressure water jets will penetrate into the profiles on the steel surface, removing salts and contaminants leaving a "clean surface" for re-painting.

Fluidtech will undertake the complete hydro-blasting and painting contract by providing diesel engine driven hydro-blasting machines rated up to 40000 psi working pressure. Highly experienced technicians and hydroblasters with hydroblasting suits and necessary PPE,s are available to complete the project within the time frame. These projects can be executed on square meter basis or on a daily equipment rental basis.



Hydro-blasting of hull area



**Hydro-blasting of underwater area** 

#### Visual conditions of surface cleanliness

The water jetting industry has set out the surface cleaning standards which are described, as follows

WJ-1: Surface shall be free of all previously existing visible rust, coatings, mill scale and foreign matter and have a matte metal finish.

WJ-2: Surface shall be cleaned to a matte finish with at least 95% of the surface area free of all previously existing visible residues and the remaining 5% containing only randomly dispersed stains of rust, coatings and foreign matter.

WJ-3: Surface shall be cleaned to a matte finish with at least two-thirds of the surface area free of all previously existing visible residues (except mill scale) and the remaining one-third containing only randomly dispersed stains of previously existing rust, coatings and foreign matter.

WJ-4: Surface shall have all loose rust, loose mill scale and loose coatings uniformly removed.





#### Hydro-demolition of concrete

Hydro-demolition is the fast, effcient and controllable method to remove deteriorated and excess concrete by applying high pressure or ultra high pressure water jets directly on to the concrete surface. By utilizing water jets as the demolition force, other items like steel bars, I-beams, steel structures are left intact and reusable. Unlike other conventional methods, hydro-demolition does not affect the surrounding structures and also does not induce any micro cracking in the main structure.





Hydro-demolition of concrete support piers (Dubai Metro)

Fluidtech offers a wide range of high pressure and ultra high pressure pumps with specialized accessories for hydrodemolition and scrabbling of concrete surfaces and structures. UHP and HP pump units with accessories and experienced hydro jetting operators can be hired on daily/weekly/monthly rental basis.

#### Internal scrabbling of chimney cement lining

Fluidtech carried out a prestigious project in Thailand where the internal damaged cement surface of a chimney was removed. The chimney was 200 mts tall and the project was carried out with internal scaffolding for operator safety. The UHP equipment used was our 150 TJ3 model, diesel engine driven water jetting pump set rated to 40000 psi (2760 bar) with a dump style jetting gun and a self-rotating nozzle carrier complete with sapphire jets.



Internal water jetting of the chimney



200 meters tall chimney



#### Water jet lancing

For many years the Oil and Power Generation Industry have used the power of water to clean heat exchangers, boilers, fin fan cooling tubes and drill pipes etc without damaging the tubes. High pressure and ultra high pressure pumps along with flexible or rigid lances and penetrating nozzles are used to clean the pipe and tube internals. Generally hand gun operation will be used for external cleaning.





Water jet cleaning of heat exchanger tubes

A wide range of high pressure water jetting pumps rated from 500 bar to 1000 bar (7250 to 14500 psi) pressure and ultra high pressure pumps up to 2760 bar (40000 psi) are available for lancing projects.

#### District cooling flushing-closed loop system

District cooling is the environmentally friendly method to provide air conditioning for buildings in commercial and residential properties by supplying chilled water from a centralized chiller plant through a piping network.

In the Civil Construction Industry, Fluidtech offers high volume centrifugal pumps, pipework, filters and valves for district cooling and potable water pipeline flushing and chemical cleaning projects.

A multi-bag filter skid will be used to remove debris and other contaminants from the circuit.

The method of closed loop flushing is recommended to avoid disposal of water after chemical cleaning and passivation.

Diesel engine driven centrifugal pumps can be run in parallel to cover small and large pipeline diameters to achieve the desired flushing velocity.





**Pipeline Flushing (closed loop system)** 



#### Pipeline flushing - open loop system

In the open loop system the water is pumped through the pipeline and returns to an open tank which would have a mesh type filter screen to remove larger particles. Once again, as in the closed loop system a filter skid is used to remove the debris and smaller particles.



Typical multi-bag filter skid



Flushing by open loop system

#### **Hydro-testing of storage tanks**

Bulk storage tanks are hydro-tested by filling with seawater or fresh water into the tank, so as to detect any leaks in shell weld joints and also to check the load stabilization of the tank foundations.

Fluidtech offers high volume diesel engine driven centrifugal water filling pumps, suction and discharge hoses, manifold, NRV,s and isolation valves etc with experienced crew members for hydro-testing and cleaning ofstorage tanks.

Usually the tank filling shall be carried out in four stages, 25%, 50%, 75% and 100% of the maximum water level of the tank. A settlement period of 24 hours is generally allowed after each stage of filling, so as to check the integrity of the tank and foundation. Once the hydro-testing is approved, the same network of hoses shall be used to discharge the water back into the sea or to an adjacent tank.

#### High pressure cleaning of storage tanks

Cleaning is carried out by using a twin gun wash down pump at 400 to 500 bar pressure. A specialised electric cradle is used to clean the higher levels of the tanks. This cradle can be dis-assembled and passed through one of the access manholes. By using a high pressure pump with fresh water this will remove the salt and outside contaminants from the tank. Chloride test shall be carried out to ensure the tank is free from salts/chlorides.



Hydro testing of storage tanks





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