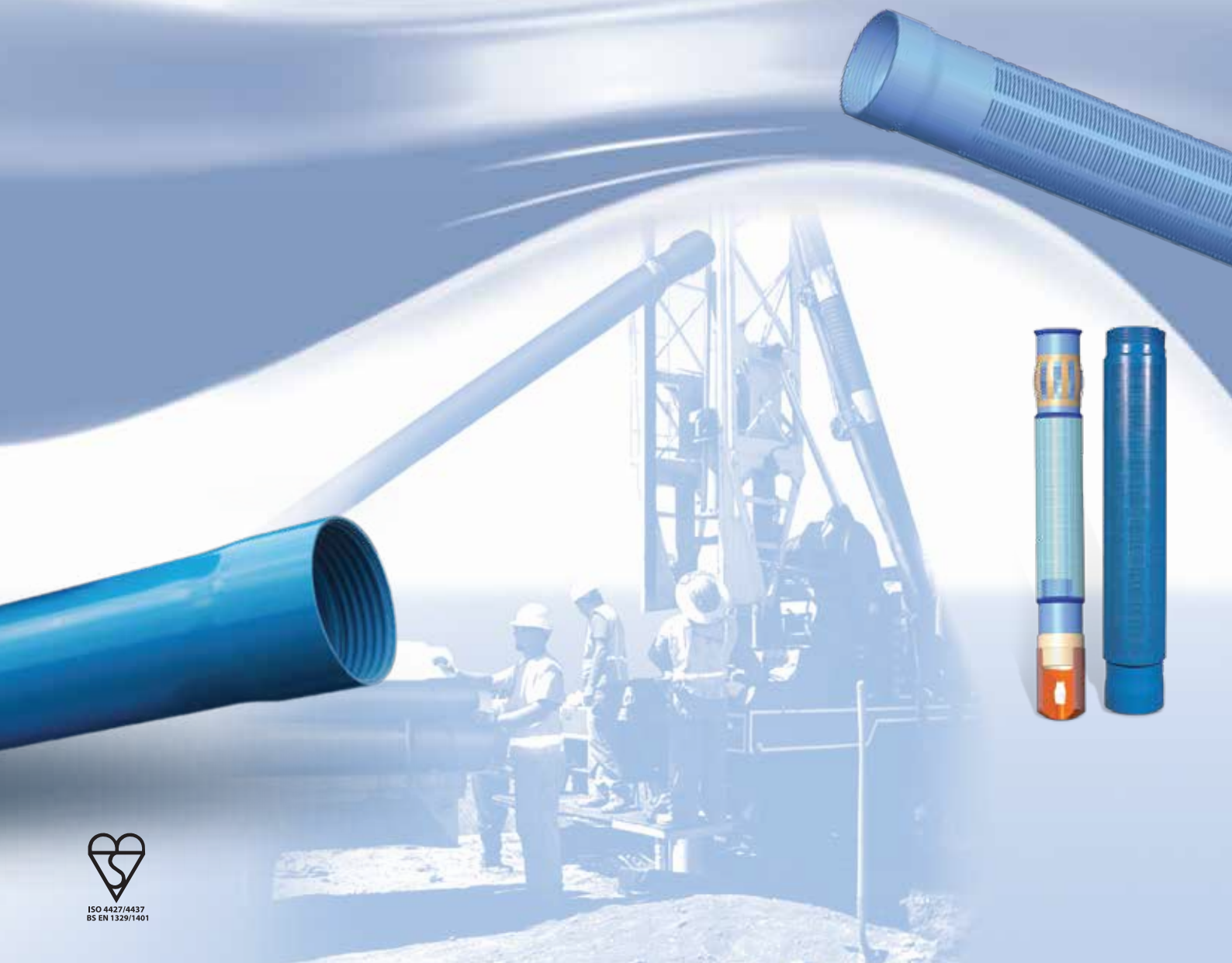




uPVC WELL CASING & SCREEN PIPES



ISO 4427/4437
BS EN 1329/1401

Cosmoplast, a primary member of Group Harwal, has been at the forefront of the plastic industry in the Gulf region since its founding in 1976. Through constant growth and product diversification, the company continues to be the largest thermoplastic pipe manufacturer in the region.

Continuously enhancing its capabilities in plastic manufacturing technologies, Cosmoplast now utilizes a diverse range of materials such as uPVC, polyethylene (PE100, PE80, LLDPE), cross linked polyethylene (PEX), random copolymer polypropylene (PP-R), and glass-reinforced plastic (GRP).

Cosmoplast's ongoing research and development programs continue to add new products to its pipeline systems product range that now includes pre-insulated pipes, reinforced thermoplastic pipes, specialized plumbing systems and fabricated uPVC and GRP manhole systems. Its state of the art engineering, design and tool room facilities are fully capable of manufacturing moulds, dies, machinery equipments and other specialized tooling requirements to meet the company's continual expansion and product development requirements.

With this extended product range, Cosmoplast's pipeline systems cater to an extensive range of market sectors and applications covering infrastructure development, plumbing, oil & gas, district cooling, irrigation, landscaping and water extraction.

An ISO 9001 certified company, Cosmoplast has its production facilities based in Sharjah, Abu Dhabi and Dubai converting over 75,000 metric tons of plastic per annum. In addition to these, Cosmoplast also has upcoming facilities in Saudi Arabia, Moscow and Kaliningrad.



COSMOPLAST PIPELINE SYSTEMS PRODUCT RANGE INCLUDES:

INFRASTRUCTURE PIPELINE SYSTEMS (uPVC, PE, GRP)

uPVC and Polyethylene pipeline systems with sizes ranging from 15mm up to 2000mm, well casings and screens and GRP pipeline systems with sizes from 100mm up to 1400mm for applications including

- Water extraction • Water distribution • Drainage • Sewerage • Gas distribution • Cable ducting

PLUMBING SYSTEMS (uPVC, PP-R, PEX, HDPE DRAINAGE)

Comprehensive range includes uPVC systems for drainage, random polypropylene (PP-R) [plain and aluminium composite] and cross linked polyethylene (PEX) systems for water and sanitary applications and uPVC high pressure pipes and fittings for water supply and A/C drain. Plumbing accessories such as pipe clamps, polyethylene compression fittings, solvent cements, lubricants and adhesives compliment this product range.

PRE-INSULATED PIPES (HDPE-HDPE, HDPE-GRP, HDPE-STEEL, GRP-HDPE, GRP-GRP, GRP-STEEL)

Jacket – core pipe combination with polyurethane insulation are used for applications such as District Cooling systems, Oil & Gas and other industrial applications. Cosmoplast provides HDPE and GRP pipes as jackets and HDPE, GRP and steel as core pipes.

IRRIGATION SYSTEMS (LLDPE)

Consists of high precision inline drip pipes and landscape and lawn edging. This range also includes saline resistant valves, drainage systems, sprinklers and central controllers.

REINFORCED THERMOPLASTIC PIPES (RTP)

Available in length of upto 500m, with a working pressure of 150 Bar at a temperature of 60 degrees celsius. RTP is used for gas distribution networks, oil flow lines and water injection lines.



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ISO 9001 FM 75767

Introduction

To keep sand and gravel from collapsing into the borehole, it is necessary to use well casing and screen pipes in all water wells. The slotted screen supports the borehole walls while allowing water to pass through the slots to the pump. The un-slotted casing is placed above the screen to keep the rest of the borehole open and serve as a housing for the pumping equipments.

Cosmoplast PVC Well Casing and Screen pipes are the ultimate corrosion-resistant piping solution for well drilling industry. Cosmoplast is the industry leader in high performance well casing and screen pipes, which are specially designed and produced to stand up the heavy handling and operation. Cosmoplast PVC well casing and screen pipes are less than one seventh the weight of conventional steel casing and screens.

The lifespan of the best traditional API metal casing systems is usually up to a maximum of 10 years, while PVC well casing lifespan is in excess of 50 years.

Aggressive saline water or water containing high sulphur levels dramatically increases the rate of deterioration of the metallic casing, thus causing sand intrusion and frequent borehole pump failures.

Wells equipped with welded steel casing pipes are less expensive than API pipes but have a considerably shorter service life. The only durable alternative is high-grade stainless steel system, but they are rarely used due to the very high cost involved.

PVC well casing systems developed by Cosmoplast are highly economic and an efficient alternative to standard metal casing systems.



Advantages of Cosmoplast PVC Well Casing and Screen Pipes

Cosmoplast PVC casing and screens present the below advantages:

- Easy to handle and quick to install, thanks to its light weight.
- The smooth internal walls improve the water flow and reduce the friction loss.
- Each pipe is male threaded on one side and female threaded on the other side, which allows easy assembly with perfect fit.
- Longer service life and minimized well rehabilitation cost, as PVC pipes are more resistant than conventional steel pipes to corrosion, clogging and encrustation. PVC casing and screen systems can have about triple the life of high quality steel systems.
- High Chemical Resistance, which makes PVC resistant to all chemicals normally found in wells, including chlorine disinfectants and corrosive acids often used for well rehabilitation and maintenance.
- Because PVC is a non-conductor, the chances of lightning damage are minimized.
- PVC casing systems are more economic when compared with high quality steel and stainless steel casing systems.
- PVC casing systems are more durable and easier to handle, thus providing longer life spans with less downtime and hence lower operating costs.
- PVC casing systems have much lower service requirements due to considerably lower levels of carbonate accumulation.
- Where required PVC well casing can be drilled through, to increase well size or go deeper. This may be considerably more economic when compared to drilling a completely new well.

Resistance To Biological Attack and Growth

Casing and screen made from uPVC is completely immune to any microscope life that it might be exposed to. It also does not offer a food source to any bacterial life form and is completely guaranteed to withstand any such growth.

Resistance To Weathering

Long and high temperature exposure to sunlight, especially in the Middle East where the surface temperature of pipes may rise significantly above the ambient temperature, may considerably reduce the tensile strength of uPVC pipes. Due to certain ultra violet radiation, the pipe surface can discolour and craze over. This degradation causes a marked reduction of the pipes in addition to color change.

Solar gain i.e the heat that the pipes absorb when exposed to direct sunlight, may also cause permanent damage to pipes and fittings and therefore, proper precautions must be taken while storing them as detailed previously in this brochure.

Resistance to Abrasion and Tuberculation

Abrasions on uPVC pipes whether due to stress from abrasive fluids or excessive pressure are never localized and cause erosion over a large area. Generalizations would not be appropriate due to the large types of abrasions possible. Tests have however shown that uPVC pipes are up to 2.5 times more resistant to abrasions when compared to mild steel. uPVC are totally immune to tuberculation caused by soluble enerumants such as calcium carbonate, as it does not offer a firm base to any precipitate.

Large and Extra Large Diameter Well Casing and Screen

Unique among the items that Cosmoplast can offer is its 1,000 mm diameter well casing and screen products. These have been configured for some of the more unusual well requirements which are found in the gulf region.

These sizes can be produced in solid wall formats utilizing either a single extrusion or multi-layer co-extrusion with the screw jointing system employing an enhanced moulded thread design.

One of the major advantages of such a size lies in its down well storage capability due to the volume of water, which can be held within the casing/screen structure.

Nominal Diameter		Wall Thickness (mm)	Joint Type
(Inch)	(mm)		
40"	1,000	32	Moulded Thread
25"	630	20-22	Moulded or Cut Thread

Slot size 1 or 2 mm depending on customer specifications

Cosmoplast co-extruded casing and screen products are at the vanguard of material development in well casing systems. These unique pipes are made from specialized uPVC formulations, which provide high tensile strength coefficients thus allowing reduced operational wall thickness when compared to normal well casing products.



Standard Range According to DIN 4925 Parts I, II, III

Nominal Size	Inch	2"	3"	4"	4.5"	5"	6"	8"	10"	12"	14"
	mm	50	80	100	115	125	150	200	250	300	350
Test Mandrel Diameter	mm	50	77	98	110	122	144	195	243	290	350
Internal Diameter	mm	52	80	103	115	127	150	205	255	301	365
Outside Diameter	mm	60	88	113	125	140	165	225	280	330	400
Limit Deviation	a b	+0.2 0	+0.3 0	+0.3 0	+0.3 0	+0.4 0	+0.4 0	+0.5 0	+0.5 0	+0.6 0	+0.7 0
Wall Thickness	mm	4.0	4.0	5.0	5.0	6.5	7.5	10.0	12.5	14.5	17.5
Limit Deviation	a b	+0.6 0	+0.6 0	+0.7 0	+0.7 0	+0.9 0	+1.0 0	+1.2 0	+1.5 0	+1.7 0	+2.0 0
Max. OD at Connection	mm	66	94	121	132	149	176	241	297	350	425
Screw Length	mm	51	55	55	55	55	85	95	115	115	150

Heavy Duty Ranges 6" to 25" Screen and Casing Configuration

OD (Inch)	OD (mm)	ID (max.) (mm)	Wall Thickness (min.) (mm)	Thread Details
6"	168	148	10.0		Round/Trapezoidal/Buttress
8"	225	200	12.5	—
8"	225	197	14.0	—
10"	280	255	12.5	—
10"	280	252	14.0	—
10"	280	250	15.0	—
10"	280	248	16.0	—
10"	280	244	18	—
12"	330	301	14.5	—
12"	330	294	18.0	—
12"	330	292	19.0	—
14"	400	358	21	—
16"	450	407	21.5	—
20"	540	500	20	—
20"	540	490	25	—
25"	630	586-590	20-22	—



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Durawell Screen

Similar to the Well Casing products, the Durawell Screen is made of a specially formulated uPVC compound to provide maximum hoop and axial strength, material stability and total resistance to corrosion or chemical attack. Different water table conditions will dictate the types and specifications of screen to be used to provide efficient and trouble free operations over the longer term.

Critical factors such as open area and slot width of the screen will be specified by the size and type of the sand and gravel packing required by either the end user or drilling contractor involved. The Durawell range has been specifically developed to offer a specialized screen configuration for most water well and aquifer conditions encountered.



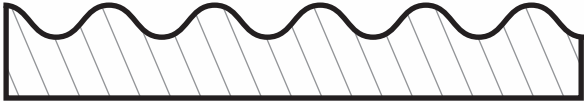

uPVC Well Casing Pipe Specification (Special Sizes)						
Size	Min. OD (mm)	Min. WT (mm)	Normal ID (mm)	Type of Thread	Thread Pitch (mm)	Thread Length (+/- 3mm)
2"	60.2	5.0	50	Trapezoid	6.00	60
3"	88.7	6.2	76	Trapezoid	6.00	60
4"	114.1	6.0	102	Trapezoid	6.00	63
5"	140.0	6.5	127	Trapezoid	6.00	63
6"	168.0	10.0	148	Trapezoid	12.00	88
8"	225.0	10.0	205	Trapezoid	12.00	88
	225.0	12.5	200	Trapezoid (FJ), Buttress (N)	6.00 (FJ), 14.00 (N)	94
	225.0	14.0	197	Buttress	14.00	94
10"	280.0	16.0	248	Buttress	14.00	106
	280.0	18.0	244	Buttress	14.00	106
12"	330.0	16.0	298	Buttress	14.00	106
	330.0	18.0	294	Buttress	14.00	106
	330.0	19.0	292	Trapezoid (FJ)/ Buttress (N)	12.00 (FJ)/ 14.00(N)	106
*14"	400.0	13.5	373	Buttress	14.00	106
18"	450.0	15.0	420	Buttress	14.00	106
*20"	500.0	14.6	471	Buttress	14.00	106
	500.0	21.4	457	Buttress	14.00	106
	542.5	20.0	503	Buttress	14.00	106
*25"	630.0	18.4	593	Buttress	14.00	106

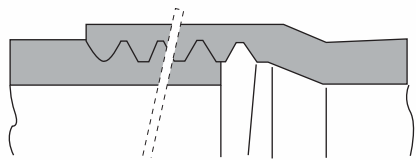
Note : * All related details mentioned as per general calculation.

uPVC Screen Pipe Specifications (Special Sizes)											
Size	Min. OD (mm)	Min. WT (mm)	Normal ID (mm)	No. of Slot Row (Circumference)	Cutting Blade Dia (mm)	% Slot Length to Circumference (+ / - 5%)	Slot Width				
							% of Open area				
							0.50	0.75	1.00	1.50	2.00
2"	60.2	5.0	50	4	80	69%	5	8	10	14	17
3"	88.7	6.2	76	4	130	70%	5	8	10	14	18
4"	114.1	6.0	102	5	160	70%	5	8	10	14	18
5"	140.0	6.5	127	5	160	63%	5	7	9	13	16
6"	168.0	10.0	148	5	160	71%	5	8	10	14	18
8"	225.0	10.0	205	6	160	68%	...	8	10	14	17
	225.0	12.5	200	6	160	68%	...	8	10	14	17
	225.0	14.0	197	6	160	69%	...	8	10	14	17
10"	280.0	16.0	248	6	175	73%	...	...	10	15	18
	280.0	18.0	244	6	175	73%	...	...	10	15	18
12"	330.0	16.0	298	8	160	74%	...	...	11	15	19
	330.0	18.0	294	8	160	74%	...	...	11	15	19
	330.0	19.0	292	8	160	74%	...	...	11	15	19
*14"	400.0	13.5	373	8	160	74%	...	...	11	15	19
*18"	450.0	15.0	420	8	175	65%	...	...	9	13	16
*20"	500.0	14.6	471	10	175	70%	...	...	10	14	18
	500.0	21.4	457	10	175	70%	...	...	10	14	18
	542.5	20.0	503	10	175	65%	...	...	9	13	16
*25"	630.0	18.4	593	12	175	70%	...	...	10	14	18

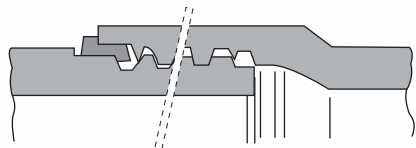
Threaded Joints

Different types of thread profiles, used in Durawell casing & Screen.

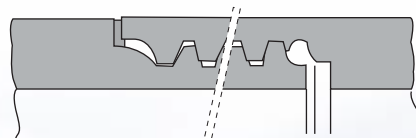
- a**  G.P. Acme or - Trapezoidal Thread - to DIN 2999 with a modified depth to DIN 4925 pitch 6.00 mm
- b**  Trapezoidal with Rounded Shoulder - Cut to DIN 103 or bs 1104 with a modified depth to complement pitch. Pitch 12.00 mm
- c**  Rounded Thread - A special thread for use on heavy duty large diameter casing with a 14mm pitch.
- d**  Special Buttress Thread* - 14mm pitch



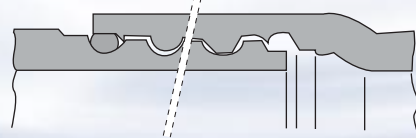
Whitworth Pipe Thread



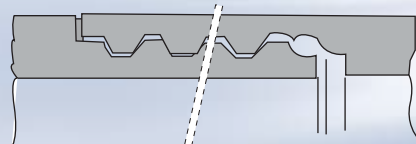
Trapezoidal Thread DIN 4925



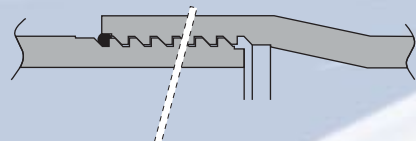
Flush Joint Trapezoidal Thread



Trapezoidal Round Shoulder Thread



Flush Joint with Trapezoidal Round Shoulder Thread



Buttress Thread*

Deep Well uPVC Casing System

Deep well uPVC casing system manufactured by Cosmoplast can be lowered to depths of upto 600m. The system comprises of the following components:

Well Casing Pipe

uPVC well casing pipes are produced with special threaded ends enabling the pipe joints to handle the high compressive and tensile forces generated during the installation. Casings of various sizes can be produced according to the customer requirements.

Well Screen Pipe

This dynamic new well screen design uses a slotted pipe. This pipe acts as a jacket encasing the central slotted core pipe. This assembly is capable of delivering water pumped at a rate of upto 1,500 gallons per minute.

Guide Shoe

This is a standard industry component comprising of a heavy-duty one-way valve located inside a concrete mass. It is used to guide the installation of casing and screen column in the temporary borehole without scraping the bentonite clay coating of the walls. It also helps in the compaction of the silica sand/gravel pack of the annular space.

Centralizer

The centralizer keeps the casing/screen pipes installed exactly at the centre of the borehole thus maintaining the alignment and ensuring the uniformity of the annular space.

Cosmoplast supplies a unique adjustable acetal centralizer which is stable up to operating temperatures of 80°C, has a low coefficient of friction, possess high strength and stiffness and is chemically and biologically inert - a major advantage for potable water wells.

Transition/Adaptor Pipe

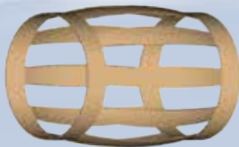
A transition or an adaptor pipe is a non-corrosive metal component that acts as an adaptor for the PVC casing buttress thread and the metal guide shoe thread.



Thermo Weld Joint Casing & Screen

Standard Well Screen Pipe

Deep Well Screen Pipe



Centralizer



Transition/Adaptor Pipe

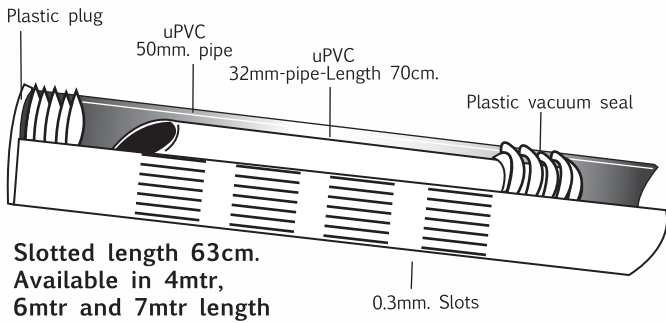


Guide Shoe

Well Point Dewatering System

Dewatering systems are used to lower the groundwater table adequately in cohesive and low permeable soils. In dewatering systems, water is pumped off from the sumps along the slopes of the excavation works.

The open dewatering system consists of a number of wellpoints that are spaced along a trench or around an excavation site and all points are connected to a common header. The headers are usually attached to one or more pumps that perform the pumping operation.



Filterwell, Granulepack, Gravelpack

The Filterwell system is a combination of an internal screened pipe and an external slotted jacket pipe with a granular uPVC filter medium located in the gap between the two. Granulepack is a normal screened pipe covered with a bonded uPVC granular filter medium. The structure of Gravelpack is similar to the Granulepack with the exception of the filter medium comprising of specialized fine-grained sand.



	Filterwell			Granulepack		Gravelpack			
OD (Inch)** (mm)	12 330	25 630	40 1,000	12 330	25 630	10 280	12 330	14 400	25 630
Wall thickness (mm)	14.5-16	20-22	32	14.5-16	20-22	12.5-14.5	14.5-16.5	17.5-20	20-22
Filter thickness (mm)	8	15	17	15	17-22	13-17	15-18	17-19	17-22
Outer shell thickness (mm)	6	7.5	10	N/A	N/A	N/A	N/A	N/A	N/A
Granulation size (mm)	1.3*	1.3*	1.3*	2-3	2-3	1-1.5	1-1.5	1-1.5	1-1.5
Joint Type	Moulded or cut	Moulded or cut	Moulded or cut	Moulded or cut	Moulded or cut	Moulded or cut	Moulded or cut	Moulded or cut	Moulded or cut

Slot size 1 or 2 mm depending on customer specifications. *Depending on filter medium used. Jointing as per customer requirement, moulded thread or cut thread available. **Nominal Diameter

Handling

- As uPVC is a material that is approximately 1/5th of the weight of ductile iron, then proper handling of this material is an area which is sometimes incorrectly addressed and thus can seriously affect the quality of the final pipe system structure.
- During transportation, casing and screen must not be handled roughly. This is particularly so when they are in contact with hard surfaces. Dropping from a height or dragging them from one place to another may damage the pipes and make them unsuitable for use.
- Use of improper machinery/handling equipment for lifting or moving pipes must be avoided at all times.
- Where mechanical handling equipment is used, it should be ensured that any metallic implements do not come in direct contact with the pipes. Fibrous material like ropes and web slings are ideal for such purposes, as they will not damage the pipe walls.



Transport

- The transportation vehicle must ideally have a flat bed, free from any rough surfaces or corrugations.
- The overhanging of pipes from the bed of the transporting vehicle must not exceed 1 Meter, must be evenly supported and should be loaded with sockets aligned at alternate ends.

Storage

- If uPVC casing or screen is to be stored for long periods of time, It is necessary to observe a few precautions.
- IN BUNDLES. It is important that factory made bundle should have a flat surface to rest on. The bundles must remain undisturbed till they are required for use as excessive movement can damage them permanently.
- LOOSE. These must also have a flat surface to rest on and it may be sometimes necessary to level the appropriate site prior to storage. Alternatively, timber supports, not less than 75 mm wide placed at distances not greater than 1,5 meters can also meet this requirement.
- Casing and screen sockets must be placed with alternating ends to avoid damage to the sockets. Casing of different dimensions should be stored separately. Wherever this is not possible the larger and heavier ones must always be at bottom stack.
- The stack height should be restricted to seven layers or less, with the total height not exceeding 2 meters. Where a storage period of more than a month is anticipated, the stack must never exceed 4 layers or a maximum stack height of 1 meter. All stacks should be properly covered by tarpaulin, which should be securely fastened to the timber supports to afford shaded and airy storage conditions.

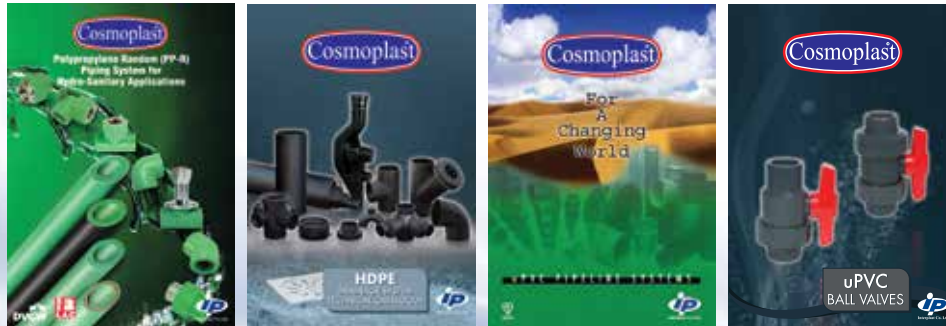
On Site Handling and Storage Guidelines

uPVC threaded socket pipes are used mainly as casing and screen pipes. In this case extreme care should be taken to safe guard the pipe thread from any damage.

- Threaded socket pipes are bundled and strapped in a special way with proper wooden packing to avoid damage of pipe thread, As far as possible strapping should remain in position until such time that the pipe is to be used.
- Where individual casing and screen pipe lengths are stacked on the site, such individual pipes should be stored on flat even ground and the total height of the stack should not cross one meter.
- While lifting each pipe vertically always use lifting piece which can be coupled to the pipe, Lifting pieces are made from the same pipe material and are available with us.
- Continuous use of lifting piece can damage its thread. It is advisable to discard it and use new lifting piece if the thread is found worn out after some usage.
- Pipes should be properly protected from direct sunlight. If covered by tarpaulin care should be taken to provide proper airflow to avoid heat entrapment.
- PVC pipes are difficult to ignite with a naked flame but once ignited can burn extremely fiercely. Although the risk is small, storage should take account of possible sources of ignition and the consequences of a possible fire.
- Never place pipes in contact with lubricating or hydraulic oil, gasoline, and solvents. Pipes should be stored away from exhaust outlets and all other high temperature sources.
- In the case of site storage careful consideration should be given to the following aspects:-
- Security of all materials and equipment from theft, accidental damage or contamination.
- Safety of the general public, especially children and blind persons.
- The movement of traffic, construction equipment, farm machinery and animals.



Pipeline Systems



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