

TRADE MARK
212412

KAWSAR



کوثر

Pipe Manufacturing Company
Kabul

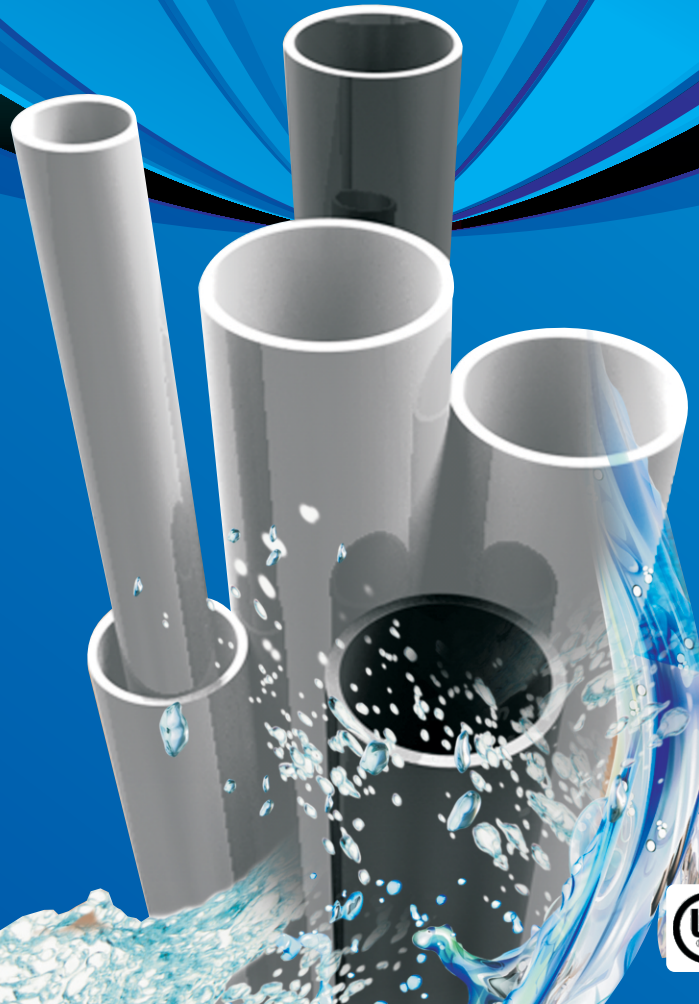
Kawsar Engineering Peshawar

شرکت تولید پاپ

شرکت انجنیری کوثر پشاور

uPVC PRESSURE PIPES | uPVC SEWERAGE PIPES
uPVC CONDUIT PIPES

An Innovative Piping System for Water, Natural Gas and Cable Ducts



Manufactures According To



Quality, Durability Reliability For Life Time

CLIENTS WE HAVE WORKED WITH

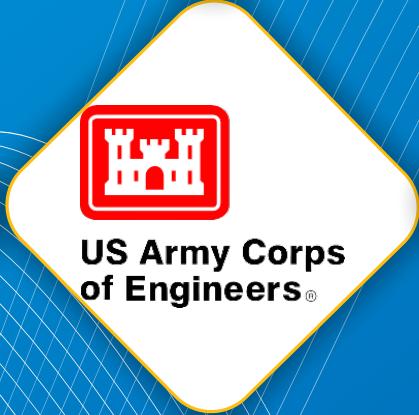




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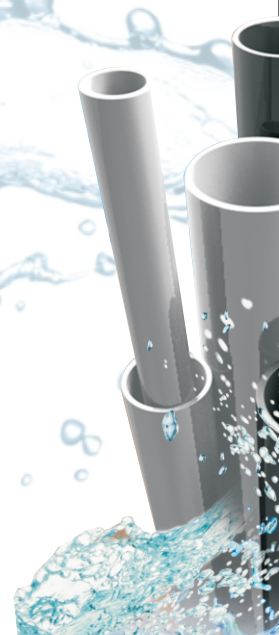
PVC SCREEN PIPES

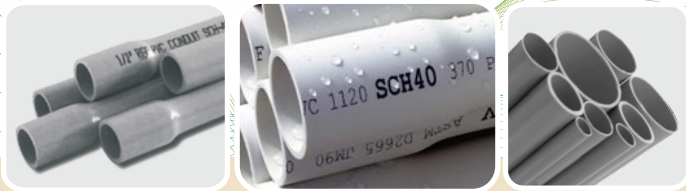
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PVC ELECTRICAL CONDUIT

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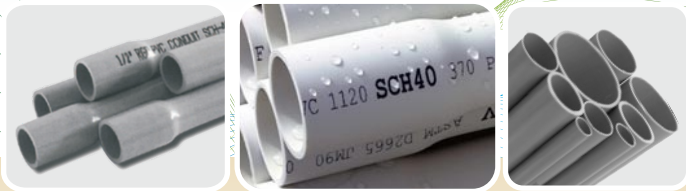
DESIGN & ENGINEERING DATA



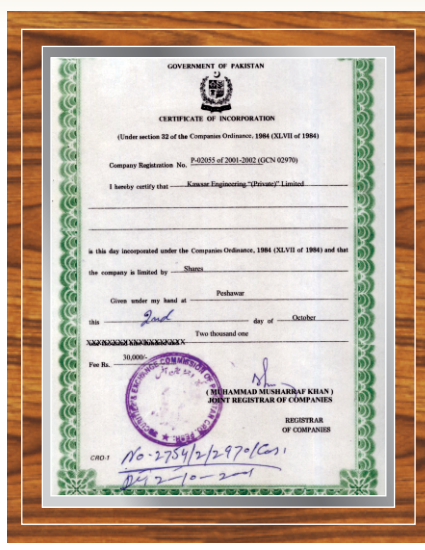
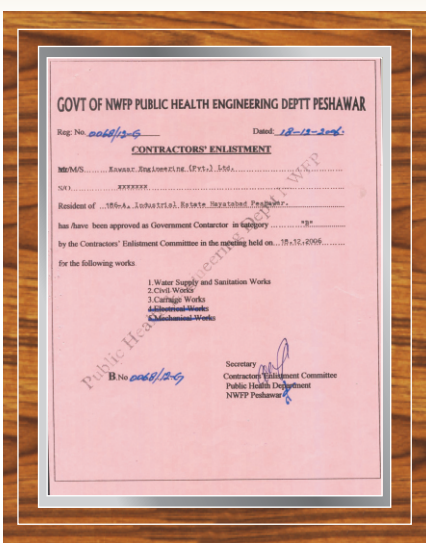


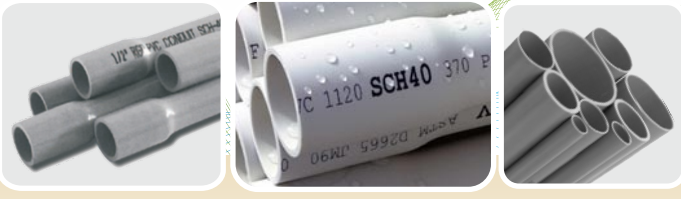
CERTIFICATIONS IN AFGHANISTAN





CERTIFICATIONS IN PAKISTAN





INTRODUCTION

Kawsar Pipe Manufacturing Company has registered with Afghanistan Investment Support Agency (AISA) in Afghanistan since 2005 and with co-operation, collaboration and support of AISA kawsar Pipe started its regular production of plastic Polyvinyl Chloride (PVC) Pressure and non-Pressure Pipe system for cold, potable water and other industrial uses. After achievement in PVC Kawsar Pipe now started PPR-C, HDPE Pipes & Fitting with advance Technology and a manufacturer for water Hand Pumps.

Kawsar previously started its production in Peshawar Pakistan as named Kawsar-Engineering Private limited which has established in 1994 as a manufacturer for water Hand Pumps, PVC Pressure, Non-Pressure Pipe, PPR-C, HDPE Pipes & Fitting. The executive partners and management of Kawsar-Engineering decided to commence PVC Pipes manufacturing company in Afghanistan after with their efforts and support of Afghanistan Investment Support Agency (AISA), Kawsar-Engineering was able to establish a manufacturing company named "KAWSAR PIPE"

We aim to set standards in every field we enter. Customer focus, quality and innovation are reflected in every aspect of business. Our strength lies in pre-empting customer expectations and product demands. Kawsar Pipe today is a hallmark of trust and reliability. This is why Kawsar Pipe employees are highly skilled and experienced labours, Kawsar Pipe utilizes the most advanced technology on its production line and retains the modern management system.

As a group, we have commitment to high ethical business values, quality of products, committed deliveries and competitive pricing. These are the factors which have taken us to the path of success achieving great heights and we are confident to achieve further heights in the times to come with the new setup. We believe that our strength lies in delighting our customers. That is why, providing quality products backed by superior technical support services, is the Kawsar Pipe promise to all our valued customers.

CERTIFICATIONS

In our quest to lead by example, our joint efforts have led KAWSAR to ISO 9001:2000 Certification and accreditation for supreme product performance and quality by the Pakistan Standard Institute (PSI) and Pakistan Engineering Council.



Manufactures According To International Standards





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PVC PRESSURE PIPES | PVC SEWERAGE PIPES | PVC CONDUIT PIPES

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ISO 9001-2008

Certified In Afghanistan

APPROVED BY

MOCI	Ministry of Commerce and Industries of Afghanistan
ACCI	Afghanistan Chamber of Commerce and Industries
AIA	Afghanistan Industrial Association
MRRD	Ministry of Rural Rehabilitation and Development (Afghanistan)
USACE	US Army Corps of Engineering
ABA	Afghanistan Builders Association
ICRC	International Committee of the Red Cross
IRC	International Rescue Committee
DACAAR	Danish Committee for aid to Afghan Refugees
UNICEF	United Nations Children Emergency Fund
UNDP	United National Development Program
SCA	Swedish Committee For Afghanistan
DAARTT	Danish Assistance to Afghan Rehabilitation and Technical Training
AKDN	Aga khan Development Network
ADA	Afghan Development Association
NCA	Norwegian Church Aid

ENLISTED WITH

RRCC	Road and Roof Construction Company
OHG	Omran Holding Group
MACEC	Marof Sharif Construction Company
HBCC	HewadBagram Construction Company
TGCC	Trojan General Contracting LLC
JRCC	JamehRefah Construction Company
FKACC	Faisal Khan Abad Construction Company
IECC	IECC(Ikmal Engineering Construction Company)
AGC	Alokozay Group of Companies
VICC	Vencolmtiaz Construction Company



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ISO 9001-2008

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APPROVED BY

PSI	Pakistan Standards Institution (Govt. of Pakistan)
LGRD	Local Govt. of Rural Development Dept (NWFP)
SGS	Societe General DE Surveillance
WMD	Water Management Deptt. Govt. of NWFP, Punjab
PSQCA	Pakistan Standard & Quality Control Authority
PHED	Public Health Engineering Deptt. Govt. of NWFP.
ISO	International Standards Organization
MES	Military Engineering Services
PKPWD	Pakistan Public Works Department

ENLISTED WITH

DACCAR	Danish Committee for Aid to Afghan Refugee
SCA	Swedish Committee for Afghanistan
IRC	International Rescue Committee
UNDP	United National Development Program
UNICEF	United Nations Children Emergency Fund for Pakistan and Afghanistan
ICRC	International Committee of the Red Cross
QC	Qatar Charity
QRC	Qatar Red Crescent
SRSP	Sarhad Rural Support Programme



QUALITY POLICY

Kawsar total quality control perceptive is taken as a principal while performing the mission. Our main policy is to provide the present and future needs and demands of our customers in the most economical way and on time. In all our processes, we adopt in the principle of customer oriented understanding.

Aim for improvement full participation of our staff. In this process management, our main goal is to continuously improve our production and to respond the demands of our customers, personals and suppliers.



OUR MISSION

To increase the number of pleased and trusted customers in our sector by satisfying them from our quality.



OUR VISION

To be committed to the mission of being the symbol of trust and contentment in the plastic and fittings market, KAWSAR proceeds to this targets as being the leader in the domestic market. And being a under rental and permanent supplier in the international market.



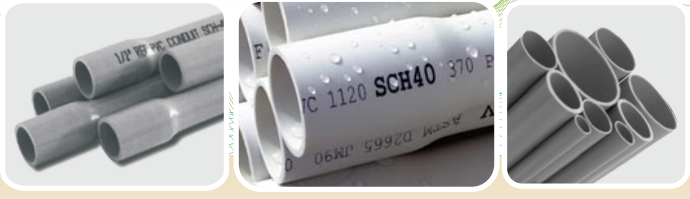
WHY KAWSAR?

Being one of the best firms in the country in manufacturing sector of PVC, PPRC, HDPE Pipes and Fittings, Kawsar Gives at most of the importance to the Quality control and:

1. Uses the most appropriate material
2. Has the most advanced high technology
3. Has well qualified technical Staff and Experienced Labor
4. Produces Pipes in compliance with the International Standards.
5. Has Well equipped laboratory which is round the clock busy to control the Quality at each stage of production



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QUALITY CONTROL

QUALITY CONTROL DEPARTMENT

Our company has a quality control department under the supervision of Quality Manager to ensure quality at all levels. The quality control department works round the clock to synchronize with shift system of the plant..



RAW MATERIAL QUALITY CONTROL.

All types of Raw material from our supplier are subject to input quality control test . Before Production Samples chosen from raw material for Test being carried out obtain suitable for Production approval.

PROCESS QUALITY CONTROL

To assure quality of the PVC Pipes during production process and finish product, Quality Control department ensures that materials used in the manufacturing process are in strict compliance with the end users' requirement and the end product is in conformity with the applicable international standards.

HIGH QUALITY AND PERFORMANCE STANDARDS

The quality and performance of PVC Pipes are assured by a wide array of tough standards, control tests and independent certifications Kawsar PVC Pipes maintain the quality of the products as per the revised and the latest standard ISO 9001/ which also is in line with the international standards on product quality.

EXTENSIVE QUALITY CONTROL

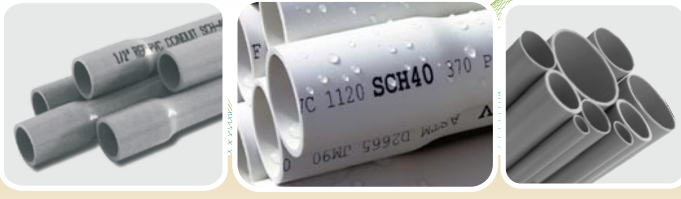
Kawsar pipe undergoes numerous quality control tests, including regular measurements of critical dimensions, tests for extrusion quality, pipe flattening, burst pressure, impact resistance, joint integrity, and hydrostatic soundness , Melt Flow rate, Internal Hydrostatic Pressure Resistance (ICPR), Longitudinal Reversion (Heat Reversion) , Tensile Strength This ensures optimum quality, reliability and long-term strength.

LABORATORY TESTING

To ensure quality of pipes following tests are regularly conducted in our laboratory as per British, Pakistan and American Standards.

- | | | | |
|----------------|--------------------|-------------------|------------------------------|
| Heat Reversion | Burst Pressure | Impact Strength | Acetone Resistance |
| Opacity | Fracture Toughness | Flattening (ASTM) | Resistance to Sulphuric Acid |
| Density | Methylene Chloride | | |

نوٹ: در وقت خرید اجناس کوثر به نشان تجارتی توجه نمائید



PVC ENVIRONMENTAL FRIENDLY

ENVIRONMENTAL PROTECTION

Kawsar PVC pipe system feature not only a long service life, but also excellent environmental and social compatibility. Since its inception, Kawsar has always placed emphasis on the fact that its products and manufacturing processes should not pollute our sensitive ecosystems and ensured development of fully recyclable materials Kawsar PVC pipe systems fulfill ecological standards, which are demanded today.

The environmentally friendly raw material is used for manufacture of Kawsar PVC pipe system. To ensure its environmental compatibility, all contained additives (color pigments and stabilizers) are extensively tested, not only by Kawsar own laboratory, but also by prominent independent laboratories

The Environmentally friendly material, Kawsar PVC piping system is recyclable and can be ground melted and reutilized for various applications e.g. motor-protections, wheel linings, laundry baskets and other kinds of plastic materials. There are no polluting substances either in its processing or in its disposal..

The environmentally friendly and hygienically enhanced, potable water pipe system, made by Kawsar is physiologically and microbiologically harmless Hygienic and low bacterial growth. The technical suitability of Kawsar PVC piping system has been evident all over.

Kawsar has always emphasized on its philosophy, that ecological and economic interests should not be contradictory, neither during production and sales, nor in the application product.

In domestic applications, the extrapolated service life of Kawsar PVC pipes is more than 30 years.

To ascertain approximate working life of Kawsar PVC pipe system, permanent temperature and pressure has to be calculated

Approved by the PSQCA, PAKISTAN HEALTH DEPARTMENT etc., puts Kawsar PVC pipes & fittings as the best selection

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KAWSAR PVC PIPES

Kawsar uses the Best quality PVC resin and compound to ensure that desirable physical properties are maintained with every production run. Kawsar PVC piping exhibits exceptional consistent quality with uniform properties; making it the preferred choice of fabricators and custom houses. Kawsar's product line has grown to include standard and custom extrusions of PVC pipe in schedules 40, 80, and 120; as well as SDR series pipe produced to 13.5, 21, 26 and 41 dimensions.

In addition to a full range of sizes, Kawsar also offers various options including: belled end, gasket end/Z-joint and threaded pipe ends, as well as custom dimensions and lengths. Kawsar PVC pipe is ideal for numerous applications including chemical processing, high purity applications, water and waste water treatment, potable water systems, agricultural, irrigation, plating, and many other industrial applications involving corrosive fluid transfer. Kawsar PVC Pipes have a wide range of products in PVC for different usage as below:

KAWSAR PVC PIPES ARE APPLICABLE FOR

Water Supply

Pressure Piping

Sewerage

Vent & Drain System

Irrigation

Potable Water Supply

Chemical Installation

Water treatment

Swimming Pools

Food Stuff Industrials

Industrial Piping

JOINTING SYSTEM

Solvent Weld Pipes

Mechanical (Tapper Ring) Pipes

Z-Joint Rubber Ring Pipes

Threaded Pipes



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid personal injury or death.



"WARNING" Indicates a hazardous situation which, if not avoided, could result in severe injury or death.



"CAUTION" Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

"NOTICE" Indicates a hazardous situation which, if not avoided, may result in system failure and property damage.

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ADVANTAGES OF PVC PIPE

While PVC is very different materials, they share numerous advantages common to plastic piping Systems. Advantages include ease of installation, corrosion Resistance, Low friction loss, Initial cost, and longevity.

Easy Installation

- PVC systems are light in weight (Approximately one-half the weight of aluminum and one-sixth the weight of steel) reducing transportation, Handling and installation cost. They have smooth, Seamless interior walls. No special tools are required for cutting. These materials can be installed using the solvent Cement joining technique.

Strength

- PVC products are highly resilient, tough and durable with high tensile and high impact strength.

Freedom from Toxicity, Odors, Tastes

- PVC piping systems designed for domestic water applications. This standard ensures the safety of products coming into contact with drinking water.

Corrosion Free External and Internal

- With many other pipe materials, slight corrosion may occur. The corroded particles can contaminate the piped fluid, complicating further processing, or causing bad taste, odors, or discoloration. This is particularly undesirable when the piped fluid is for domestic consumption. With PVC there are no corrosive by-products, therefore, no contamination of the piped fluid.

Immunity to Galvanic or Electrolytic Attack

- PVC is inherently immune to galvanic or electrolytic action. They can be used underground, underwater, in the presence of metals, and can be connected to metals.

Fire Resistance

- PVC piping systems are self-extinguishing and will not support combustion. The ASTM E 84 test protocol is used to determine the flame and smoke rating for various materials.

PVC will not pass the ASTM E-84 25/50 flame spread/smoke developed test and is not acceptable for use in plenum areas. For plenum applications, flow prevailing code requirements.

Low Friction Loss

- The smooth interior surfaces of PVC assure low friction loss and high flow rate. Additionally, since PVC pipe resist rusting, pitting, scaling and corrosion, the high flow rate can be maintained for the life of the piping system.

Low Thermal Conductivity

- PVC pipe have a much lower thermal conductivity factor than metal pipe. Therefore, fluids being piped maintain a more constant temperature. In many cases, pipe insulation is not required.

Cost Effective

- PVC products are extremely light weight, convenient to handle, relatively flexible, and easy to install. These features lead to lower installed cost than other piping system.

Virtually Maintenance Free

- Once PVC system is properly selected designed, and installed, it is virtually maintenance free. Therefore, years of trouble-free service can be expected when using KAWSAR PVC pipe system.



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Handling and Storage of PVC Pipe

Receiving Pipe

As pipe is received, it must always be thoroughly inspected, prior to unloading. The person receiving the pipe must look for any transportation damage cause by over-tightened tie-down straps, improper treatment, or a shift in the load.

Pipe received in a closed trailer must be inspected as the trailer is opened. Take extra time to ensure that the pipe has not been damaged by other materials having been stacked on top of it, load shift, or rough handling.

Visually examine the pipe ends for any cracks, splits, gouges, or other forms of damage. Additionally, the pipe should be inspected for severe deformation which could later cause joining problems. The entire inside diameter of larger diameter pipe (4" and above) must be checked for any internal splits or cracks which could have been caused by loading or transit. The use of a flashlight may be necessary to perform this inspection.

Any damages must be observed by all parties involved, including the driver, and should be clearly noted on the bill of lading and/or delivery ticket. A copy of this document should be retained by the receiver. In addition, the manufacturer and carrier should be notified, within 24 hours of any damages, shortages, or miss-shipped products.

Handling Pipe

The pipe should be handled with reasonable care. Because thermoplastic pipe is much lighter in weight than metal pipe, there is sometimes a tendency to throw it around. This should be avoided.

The pipe should never be dragged or pushed from a truck bed. Removing and handling pallets of pipe should be done with a forklift. Loose pipe lengths require special handling to avoid damage. Precautions to follow when unloading and handling loose pieces include not banging lengths together or dropping lengths, even from low heights, on hard or uneven surface.

In all cause, severe contact with any sharp objects (rocks, angle iron, forks on forklifts, etc.) should be avoided. Also the pipe should never be lifted or moved by inserting the forks of a forklift in to the pipe ends.

Handling PVC pipe particularly diameter greater than 4-

inch requires extra care as the added pipe weight can cause cracking from relatively minor impacts. Also plastic cause cracking from relatively minor impacts. Also plastic pipe becomes more brittle as the temperature decrease. The impact strength and flexibility of PVC and pipe are reduced. Therefore take extra care when handling skids or loose lengths when the temperature drops below 50°F.

Storing Pipe

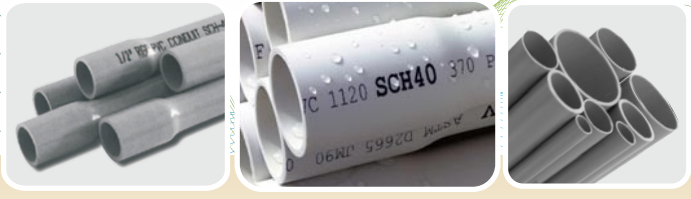
If possible, pipe should be stored inside. When this is not possible, the pipe should be stored on level ground which is dry and free from sharp objects. If different schedules of pipe are stacked together, the pipe with the thickest walls should be on the bottom.

If the pipe is pallets, the pallets should be sacked with the pallet boards touching, rather than pallet boards being placed on the pipe. This will prevent damage to or bowing of the pipe.

If the pipe is stored in racks it should be continuously supported along its length. If this is not possible, the spacing of the supports should not exceed their feet (3")

The pipe should be protected from the sun and be in an area with proper ventilation. This will lessen the effects of ultraviolet rays and help prevent heat buildup.





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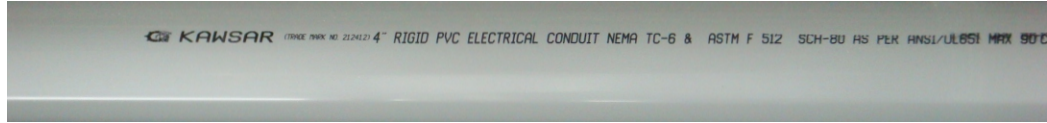
MARKING:

Kawsar Pipes are marked by ink jet stamping at one meter length as shown below:

Standards of Kawsar Pipes marking start from this sequence



Kawsar Trade Mark # 212412 (size) (class) (standard) date time shift A or B.



NOTE:



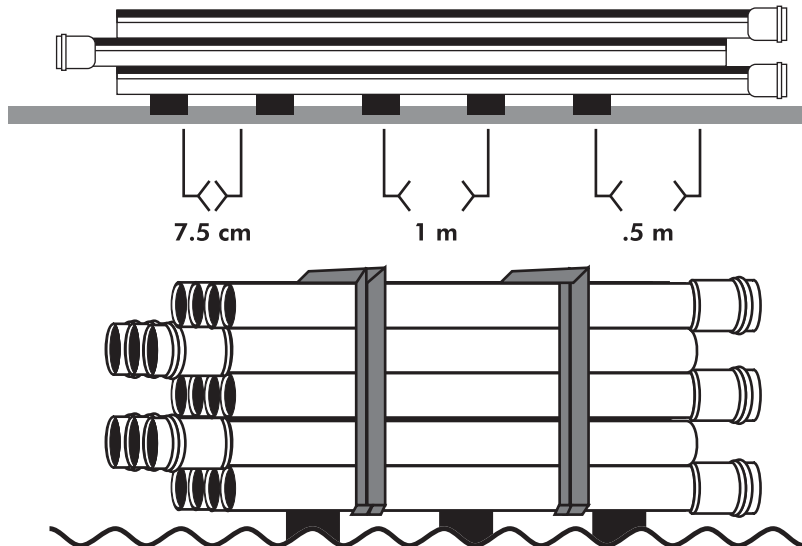
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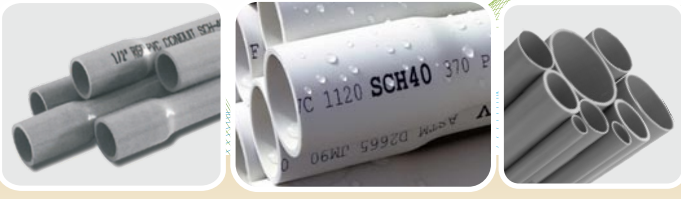
STACKING:

Pipes should be given adequate support at all times. The should not be stacked in large piles, especially under warm temperature conditions. As the bottom pipes may distort, thus giving rise to difficulty in pipe alignment and jointing. Socketed and spigoted pipes should be stacked in layers with sockets placed at alternate ends of the stack and with the sockets protruding so as to avoid lopsided stacks and the imparting of a permanent set to the pipes.

For long-term storage, pipe racks should preferably provide continuous support but, if this is not possible, timber supports of at least 75mm (3 in.) Bearing width, at spacing not greater than 1 m (3.2 ft.) Centres should be placed beneath the pipes and, if the stacks are rectangular, at twice this spacing at the different classes of pipe are kept in the same racks then the thickest classes must always be at the bottom.



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Physical Properties of PVC Materials

PROPERTY	UNITS	ASTM NO.	PVC	ASTM NO.
Specific Gravity	g/cc	D 792	1.40	D 792
Tensile Strength (73°F) Minimum	Psi	D 638	7,000	D 638
Modulus of Elasticity in Tension (73°F) Minimum	Psi	D 638	400,000	D 638
Flexural Strength (73°F)	Psi	D 790	14,000	D 790
Izod Impact (notched at 73°F) Minimum	ft lb/ in. of notch	D 256	0.65	D 256
Hardness (Durometer D)		D 2240	80 ± 3	D 2240
Hardness (Rockwell R)		D 785	110 -120	D 785
Compressive Strength (73°F)	Psi	D 695	9,600	D 695
Hydrostatic Design Stress	Psi		2,000	D 1598
Coefficient of Linear Expansion	in./ in./ °F	D 696	3.0x10 ⁻⁵	D 696
Heat Distortion Temperature at 264 psi Minimum	degrees F	D 648	160	D 648
Coefficient of Thermal Conductivity	BTU/ hr/sq ft/ °F/ in.	C 177	1.2	C 177
Specific Heat	BTU/ °F/lb	D 2766	0.25	D 2766
Water Absorption (24 hrs at 73°F)	% weight gain	D 570	.05	D 570
Cell Classification Pipe		D 3965	12454	D 1784
Cell Classification Fittings		D 3965	12454	D 1784
Burning Rate			Self-Ext.	D 635
Burning Class			V-0	UL 94**

Above data is based upon information provided by the raw material manufactures. It should be used only as a recommendation and not as a guarantee of performance. Underwriters Laboratories standard.

Physical & Mechanical Properties Of Pvc Pipes

PROPERTY	VALUE	UNIT
Specific Gravity	1.42 - 1.46	
Shore Hardness	70 - 90	----
Rockwell	110 - 120	Degree
Weather resistance	Colour fading but no decrease in strength.	
MECHANICAL	VALUE	UNIT
Tensile Strength AT 230°C	450 - 600	Kgf/cm ²
Modulus of Elasticity at 200°C	30,000	kgf/cm ²
Elongation at Break	>80%	
Impact strength at 0°C	0.5 - 1	ft lb/in of Notch
Impact strength at 20°C	1 - 2	ft lb/in of Notch
Compressive Strength	600 - 700	kgf/cm ²
Bending Strength	1000	kgf/cm ²

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THERMAL & ELECTRICAL PROPERTIES OF PVC PIPES

THERMAL

Specific Heat at 20°C	0.24	Cal/gm/C
Vicat Softening Point	85	oC
Heat Distortion Temperature at 18.5 kgf / Cm ²	75	oC
Thermal Conductivity	0.12 - 0.14	cal m/mhc
Coefficient of Linear Expansion	7 - 8x10	m/m/C

ELECTRICAL

Dielectric Constant (800 Cycle)	3.0	
Dielectric Strength	425	Volts/mil
Inflammability	will not support combustion	
Water Absorption (24 Hours at Ambient Temperature)	0.07	%



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Range & Standard of KAWSAR PVC Pipes

Kawsar PVC pipes are manufactured in the following standard and range.

PRESSURE PIPES:

- ASTM D 1785, Sch - 40 & ASTM D2665 Dual Rated
- ASTM D1785, Sch - 80
- BS - 3505 & PSI 3051
- DIN 8061 & DIN 8062



Range:

Nomial Diameter: From 1/4" to 24"

Sustained Working Pressure Upto 15 bar
(150 meter head of water)

SEWERAGE, DRAIN & VENTILIZATION

- ASTM D2665 DWV
- ASTM D2241 SDR Series
- PVC SDR 35 Sewer Pipe
- PVC ASTM D2729 Sewer & Drain Pipe
- BS -5255 Thermoplastic Waste Pipe
- BS - 4515 Soil & Ventilation
- BS - 4660 & Underground Sewerage



Kawsar PVC Pressure, Sewerage, Drain, Ventilation & conduit pipes are available in any length provided that the order is not less than 200 meters. The pressure pipe is supplied in plain, Z-joint and socketed ends with or without provision of rubber rings.

PVC ELECTRICAL CONDUIT PIPES:

- NEMA TC-2 Sch-40 & Sch-80
- NEMA TC-6, TC-8 & ASTM F512
- BS - 6099



PVC Well Casing and Screen Pipes

- ASTM F480
- ASTM D1785
- BS 3505



CPVC HOT AND COLD WATER DISTRIBUTION

- ASTM F441 CPVC Sch-40 and Sch-80

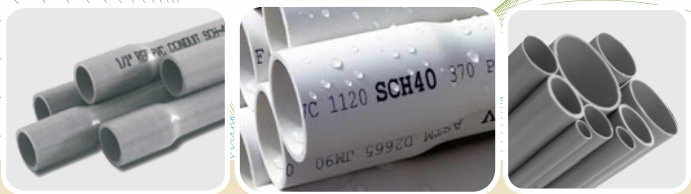


PVC Fittings

- ASTM D 2466 Pressure Fittings
- ASTM D 2665 DWV Fittings
- ASTM F512 Fabricated Fittings and Long Elbows



نوټ: در وقت خريد اجناس كوثر به نشان تجارتي توجه نماييد



Product Specifications

System: PVC Schedule 40 Pressure Pipe and Fittings System

Scope: This specification covers PVC Schedule 40 pipe and fittings for pressure applications. This system is intended for pressure applications where the operating temperature will not exceed 140° F.

Specification: Pipe and fittings shall be manufactured from virgin rigid PVC (polyvinyl chloride) Vinyl compounds with a Cell Class of 12454 as identified in ASTM D 1784.

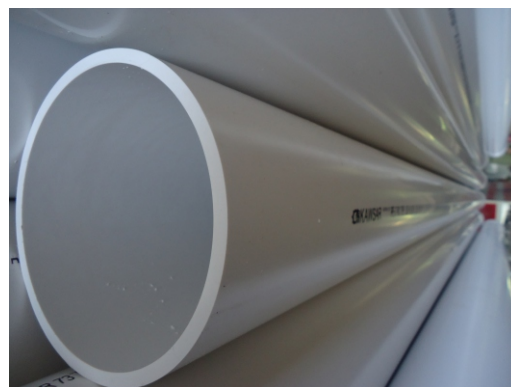
PVC Schedule 40 pipe shall be iron Pipe Size (IPS) conforming to ASTM D 1785. PVC Schedule 40 fittings shall conform to ASTM D 2466. Pipe and fittings shall be manufactured as system.

Installation shall comply with the last installation instructions published by Kawsar Pipe and Foundry and shall conform to all applicable plumbing, building, and fire code requirements. Buried pipe shall be installed in accordance with ASTM F 1668 and ASTM D 2774. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agent not compatible with PVC compounds. Systems shall be hydrostatically tested after installation.

WARNING! Never test with or transport/store compressed air or gas in PVC pipe or fittings.

Reference Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 1785	PVC Plastic Pipe, Schedule 40
ASTM D 2466	PVC Plastic Fittings, Schedule 40
ASTM D 2564	Solvent Cements for PVC Pipe and Fittings
ASTM D 2774	Underground Installation of Thermoplastic Pressure Piping
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe



Note: Latest revision of each standard applies.

Short Specification:

Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with International standards 14 and 61. Pipe shall be iron pipe size (IPS) conforming to ASTM D 1785. Fittings shall conform to ASTM D 2466.

All pipe and fittings shall be produced by a single manufacturer and shall be installed in accordance with manufacturer's recommendations and applicable code requirements. Buried pipe shall be installed in accordance with ASTM F 1668 and ASTM D 2774. Solvent cements shall conform to ASTM D 2564 primer conform, to ASTM 656. The system is to be manufactured by Kawsar Pipe Company and is intended for pressure applications where the temperature will not exceed 140°F.

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Product Specifications

System: PVC Schedule 40 Solid Wall Pipe and PVC DWV Fitting System

This specification cover PVC Schedule 40 solid wall pipe and PVC DWV fitting used in sanitary drain, waste, and vent (DWV), sewer, and storm drainage applications. This system is intended for use in non-pressure application where the operating temperature will not exceed 140°F

Specification: Pipe and fitting shall be manufactured from virgin rigid PVC (polyvinyl Chloride) vinyl compounds with a Cell Class of 12454 as identified in ASTM D 1784.

PVC Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D 1785 and ASTM D 2665. PVC DWV fittings shall conform to ASTM D 2665. All system shall utilize a separate waste and vent system.

Installation shall comply with the latest installation instructions published by and shall conform to all applicable plumbing, building, and fire code requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 656 and solvent cement conforming to ASTM D 2564, the system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agent not compatible with PVC compounds. System shall be hydrostatically tested after installation.

WARNING! Never test with or transport/store compressed air or gas in PVC pipe or fittings.

Referenced Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 1785	PVC Plastic Pipe, Schedule 40
ASTM D 2665	PVC Drain, Waste, and Vent Pipe & Fittings
ASTM D 2564	Solvent Cements for PVC pipe and Fittings
ASTM D 2321	Underground Installation of Thermoplastic Pipe (non- pressure application)
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe



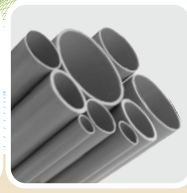
Note: Latest revision of each standard applies.

Short Specification:

Pipe and Fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform to International standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM D 1785 and ASTM D 2665.

All pipe and fittings shall be produced by a single manufacturer and shall be installed in accordance with manufacturer's recommendations and applicable code requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 1668. Solvent cements shall conform to ASTM D 2564; primer shall conform to ASTM F 656. The system is to be manufactured by Kawsar Pipe Company and is intended for non-pressure drainage applications where the temperature will not exceed 140°F.

نوټ: در وقت خريد اجناس كوثر به نشان تجارتي توجه نمائيد



PVC SCH-40 ASTM D 2665 & 1785

Outside Diameter, Wall Thickness & Tolerance for PVC Pipe Schedule 40

Product Code	Nominal Size	Outside Diameter (mm)		SCH-40 Dimensions			Weight / mtr
				Min wall thickness		Max. W.P	
		Inch	mm	Inch	mm	PSI	
D1/4WS4	1/4	0.540	13.716	0.088	2.235	780	0.128
D3/8WS4	3/8"	0.675	17.145	0.091	2.311	620	0.167
D 1/2WS4	1/2"	0.840	21.336	0.109	2.769	600	0.248
D3/4WS4	3/4"	1.050	26.670	0.113	2.870	480	0.329
D1WS4	1"	1.315	33.401	0.133	3.378	450	0.483
D11/4WS4	1-1/4"	1.660	42.164	0.14	3.556	370	0.653
D11/2WS4	1-1/2"	1.900	48.260	0.145	3.683	330	0.779
D2WS4	2"	2.375	60.325	0.154	3.912	280	1.045
D21/2WS4	2-1/2"	2.875	73.025	0.203	5.156	300	1.650
D3WS4	3"	3.500	88.900	0.216	5.486	260	2.160
D4WS4	4"	4.500	114.300	0.237	6.020	220	3.074
D5WS4	5"	5.563	141.300	0.258	6.553	190	4.169
D6WS4	6"	6.625	168.275	0.28	7.112	180	5.414
D8WS4	8"	8.625	219.075	0.322	8.179	160	8.154
D10WS4	10"	10.750	273.050	0.365	9.271	140	11.579
D12WS4	12"	12.750	323.850	0.406	10.312	130	15.280
D14WS4	14"	14.000	355.600	0.437	11.125	130	18.086
D16WS4	16"	16.000	406.400	0.5	12.700	130	23.627
D18WS4	18"	18.000	457.200	0.562	14.275	130	30.703
D20WS4	20"	20.000	508.000	0.593	15.062	120	36.066
D24GS4	24"	24.000	609.600	0.687	17.450	120	50.187

***Meets All Requirements of ASTM D 1784, ASTM D 1785,**



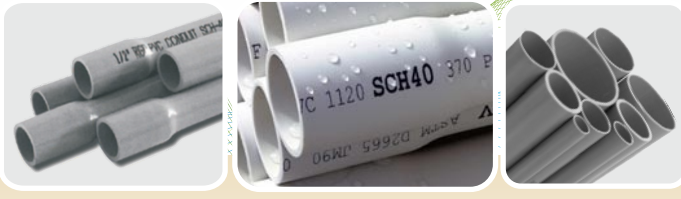
NOTE: A

Testing with or use of compressed air or gas in PVC pipe or fittings can result in explosive failures and cause severe injury or death. Never test with or transport / store compressed air or gas in PVC pipe or fittings with compressed air or gas, or air over water boosters.

Only use PVC pipe for water or approved chemicals.

Refer to warnings in PPFA User bulletin 4-80 and ASTM D 1785.

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Product Specifications

System: PVC Schedule 80 Pressure Pipe and Fitting System

Scope: This specification cover PVC Schedule 80 pipe and fittings for pressure applications. This system is intended for pressure applications where the operating temperature will not exceed 140°F.

Specification: Pipe and fittings shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a Cell Class of 12454 as identified in ASTM D 1784.

PVC Schedule 80 pipe shall be iron Pipe Size (IPS) conforming to ASTM D 1785. PVC Schedule 80 fittings shall conform to ASTM D 2467. PVC Schedule 80 threaded fittings shall conform to ASTM D 2464. Pipe and fittings shall be manufactured as a system.

Installation shall comply with the latest installation instructions published by Kawsar Pipe and shall conform to all applicable plumbing, building, and fire code requirements. Buried pipe shall be installed in accordance with ASTM F 1668 and ATM D 2774. Solvent cement joints shall be made in a two-step process using IPS P-70 or Oatey Industrial Grade premiers and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. Systems shall be hydrostatically tested after installation.

WARNING! Never test with or transport/store compressed air or gas in PVC pipe or fittings.

Referenced Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 1785	PVC Plastic Pipe, Schedule 80
ASTM D 2464 or D 2467	PVC Threaded Fittings, Schedule 80
ASTM D 2467	PVC Socket Fittings, Schedule 80
ASTM D 2564	Solvent Cements for PVC Pipe and Fittings
ASTM D 2774	Underground Installation of Thermoplastic Pressure Piping
ASTM F 1668	Procedures for Buried Plastic Pipe



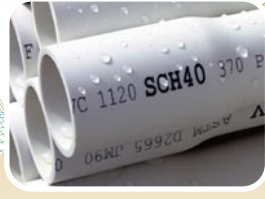
Note: Latest revision of each standard applies.

Short Specification:

Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with International standards 14 and 61. Pipe shall be iron pipe size (IPS) conforming to ASTM D 1785. Socket fittings shall conform to ASTM D 2467. Threaded fitting shall conform to ASTM D 2464 or D 2467. Flanges shall be 150# type per ANSI/ASME B 16.5.

All pipe and fittings shall be produced by a single manufacturer and shall be installed in accordance with manufacturers recommendations and applicable code requirements. Buried pipe shall be installed in accordance with ASTM F 1668 and ASTM D 2774. Solvent cements shall conform to ASTM D 2564, primer shall be IPS – P 70 or Oatey Industrial Grade. The system is to be manufactured by Kawsar Pipe Company and is intended for pressure applications where the temperature will not exceed 140°F.

نوت: در وقت خرید اجناس کاوثر به نشان تجارتی توجه نمایند



PVC PRESSURE PIPE SCH-80 ASTM D 1785

Outside Diameter, Wall Thickness & Tolerance for PVC Pipe Schedule 80

Product Code	Nominal Size	Outside Diameter (mm)		SCH-80 Dimensions			Weight / mtr
				Min wall thickness		Max. W.P	
		Inch	mm	Inch	mm	PSI	
KEP1/4GS8	1/4	0.540	13.716	0.119	3.023	1130	—
KEP3/8GS8	3/8"	0.675	17.145	0.126	3.200	920	0.211
KEP 1/2GS8	1/2"	0.840	21.336	0.147	3.734	850	0.309
KEP3/4GS8	3/4"	1.050	26.670	0.154	3.912	690	0.419
KEP1GS8	1"	1.315	33.401	0.179	4.547	630	0.615
KEP11/4GS8	1-1/4"	1.660	42.164	0.191	4.851	520	0.850
KEP11/2GS8	1-1/2"	1.900	48.260	0.2	5.080	470	1.032
KEP2GS8	2"	2.375	60.325	0.218	5.537	400	1.428
KEP21/2GS8	2-1/2"	2.875	73.025	0.276	7.010	420	2.177
KEP3GS8	3"	3.500	88.900	0.3	7.620	370	2.916
KEP4GS8	4"	4.500	114.300	0.337	8.560	320	4.264
KEP5GS8	5"	5.563	141.300	0.375	9.525	290	5.915
KEP6GS8	6"	6.625	168.275	0.432	10.973	280	8.139
KEP8GS8	8"	8.625	219.075	0.5	12.700	250	12.364
KEP10GS8	10"	10.750	273.050	0.593	15.062	230	18.362
KEP12GS8	12"	12.750	323.850	0.687	17.450	230	25.223
KEP14GS8	14"	14.000	355.600	0.75	19.050	220	30.260
KEP16GS8	16"	16.000	406.400	0.843	21.412	220	38.902
KEP18GS8	18"	18.000	457.200	0.937	23.800	220	50.026
KEP20GS8	20"	20.000	508.000	1.031	26.187	220	61.216
KEP24GS8	24"	24.000	609.600	1.218	30.937	210	86.847

***Meets All Requirements of ASTM D 1784, ASTM D 1785,**



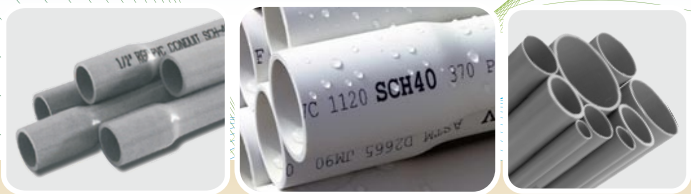
NOTE: A

Testing with or use of compressed air or gas in PVC pipe or fittings can result in explosive failures and cause severe injury or death. Never test with or transport / store compressed air or gas in PVC pipe or fittings with compressed air or gas, or air over water boosters.

Only use PVC pipe for water or approved chemicals.

Refer to warnings in PPFA User bulletin 4-80 and ASTM D 1785.

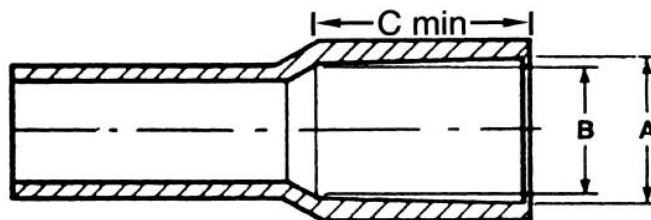
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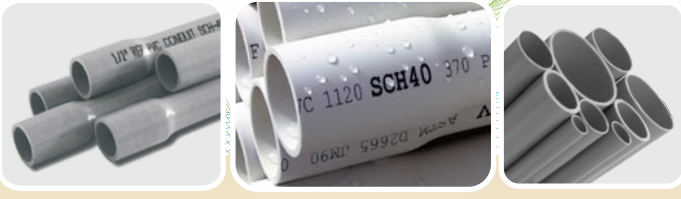
Socket Dimension for Belled-End Pipe

NOM. Pipe Size	ASTM Standard	SOCKET ENTRANCE (A)		SOCKET BOTTOM (B)		SOCKET LENGTH (C)
		I.D Min	I.D Max.	I.D Min	I.D Max.	Schedule 40
½	D 2672	.844	0.852	0.832	0.840	2.000
¾	D 2672	1.054	1.062	1.042	1.050	2.250
1	D 2672	1.320	1.330	1.305	1.315	2.500
1¼	D 2672	1.665	1.675	1.650	1.660	2.750
1½	D 2672	1.906	1.918	1.888	1.900	3.000
2	D 2672	2.381	2.393	2.357	2.369	-----
2	F 480	2.380	2.392	2.357	2.369	4.000
2½	D 2672	2.882	2.896	2.854	2.868	-----
2½	F 480	2.880	2.894	2.854	2.868	4.000
3	D 2672	3.508	3.524	3.476	3.492	-----
3	F 480	3.506	3.522	3.476	3.492	4.000
4	D 2672	4.509	4.527	4.473	4.491	-----
4	F 480	4.508	4.526	4.473	4.491	5.000
6	D 2672	6.636	6.658	6.592	6.614	-----
6	F 480	6.637	6.659	6.592	6.614	6.500
8	D 2672	8.640	8.670	8.583	8.613	-----
8	F 480	8.634	8.664	8.583	8.613	7.000
10	D 2672	10.761	10.791	10.707	10.737	9.000
12	D 2672	12.763	12.793	12.706	12.736	10.000
14	D 2672	14.020	14.050	13.970	14.000	10.000
16	D 2672	16.030	16.060	15.965	15.995	10.000

Note: All dimensions are in inches.



نوٹ: در وقت خرید اجناس کوثر به نشان تجارتی توجه نمائید



ASTM D 1785

Maximum Sustain and Burst Pressure Test conditions for water at 23 C for PVC Pipe

Sustain Pressure

Nominal Pipe Size	Pressure Required for Test PSI		
	Schedule 40	Schedule 80	Schedule 120
½	1250	1780	2130
¾	1010	1440	1620
1	950	1320	1510
1 ½	690	990	1130
2	580	850	990
3"	590	790	930
4"	470	680	900
6"	370	590	780
8"	330	520	760
10"	300	490	770
12	280	480	710

Burst Pressure

Pressure Required for Test PSI		
Schedule 40	Schedule 80	Schedule 120
1910	2720	3250
1540	2200	2470
1440	2120	2300
1060	1510	1720
890	1290	1510
840	1200	1420
710	1040	1380
560	890	1190
500	790	1160
450	750	1170
420	730	1090

ASTM D2665

Minimum Hydrostatic Burst Pressure at 73°F (23°)

Minimum Hydrostatic Burst Pressure (1 PSI = 6.89 kpa)

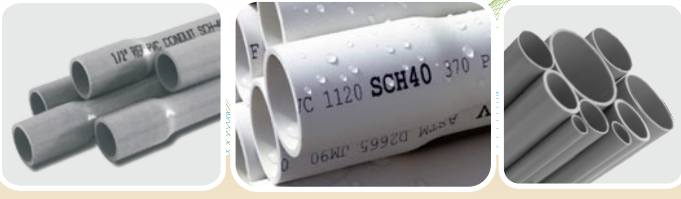
Size	PSI	KPI
1 ¼	1180	8140
1 ½	1060	7310
2	890	6140
3	840	5790
4	710	4900
6	560	3680
8	500	3450
10	450	3100
12	420	2890
14	410	2830
16	410	2830
18	410	2830
20	390	2690
24	380	2620

* These burst pressure are calculated using a hoop stress of 6400 psi (44.1 MPA)

Temperature De-Rating For Schedule 40 & 80 PVC

The operating pressure of PVC pipe will be reduced as the operating temperature increases above 73°F. To calculate this reduction, multiply the operating pressures pages by the correction factors shown below.

Operating Temperature (°F)	Correction PVC
73	1.00
80	.88
90	.75
100	.62
110	.50
120	.40
130	.30
140	.22
150	NR
160	NR
170	NR
180	NR
200	NR



Product Specifications

System: PVC SDR Pressure Pipe and Fitting System

Scope: This specification covers PVC Standard Dimensional Ratio (SDR) pipe and fittings for pressure applications. This system is intended for pressure applications where the operating temperature will not exceed 140°F.

Specification: Pipe and fittings shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a Call Class of 12454 as identified in ASTM D 1784.

PVC SDR pipe shall be iron Pipe Size (IPS) conforming to ASTM D 2241 for plain end pipe and ASTM D 2672 for belled-end pipe. PVC Schedule 40 (IPS) fittings shall conform to ASTM D 2466. Pipe and fittings shall be manufactured as a system.

Installation shall comply with the latest installation instructions published by Kawsar Pipe and shall conform to all applicable plumbing, building, and fire code requirements. Buried pipe shall be installed in accordance with ASTM F 1668 and ASTM D 2774. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. System shall be hydrostatically test after installation. **WARNING!** Never test with or transport/store compressed air or gas in PVC pipe or fittings.

Referenced Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 2241	PVC Pressure Rated Pipe (SDR Series)
ASTM D 2672	Joints for IPS PVC Pipe Using Solvent Cement
ASTM D 2466	PVC Plastic Fittings, Schedule 40
ASTM D 2564	Solvent Cements for PVC pipe and Fittings
ASTM D 2774	Underground Installation of Thermoplastic Pressure Piping
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe

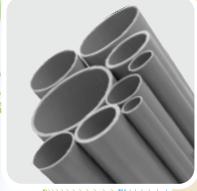


Note: Latest revision of each standard applies.

Short Specification:

Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with International standards 14 and 61. Pipe shall be iron pipe size (IPS) conforming to ASTM D 2241 for plain-end pipe and ASTM D 2672 for belled-end pipe. PVC Schedule 40 fittings shall conform to ASTM D 2466. All pipe and fittings shall be produced by a single manufacturer and shall be installed in accordance with manufacturer's recommendations and applicable code requirements. Buried pipe shall be installed in accordance with ASTM F 1668 and ASTM D 2774. Solvent cements shall conform to ASTM D 2564. Primer shall conform to ASTM F 656. The system is to be manufactured by Kawsar pipe Company and is intended for pressure applications where the temperature will not exceed 140°F.

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ASTM D 2241 (SDR Series)

Outside diameters & Minimum Wall Thickness

ID/IA	Nominal DIA		SDR 64		SDR 41		SDR 32.5		SDR 26		SDR 21		SDR 17		SDR 13.5	
	Value mm	Min.	Wall Thickness	Min.	Wall Thickness	Min.	Wall Thickness	Min.	Wall Thickness	Min.	Wall Thickness	Min.	Wall Thickness	Min.	Wall Thickness	Min.
1/2"	21.34	--	--	--	--	--	--	--	--	--	--	--	--	--	1.57	1.57
3/4"	26.67	--	--	--	--	--	--	--	--	--	1.52	1.52	1.57	1.98	1.98	1.98
1"	33.4	--	--	--	--	--	--	--	1.52	1.52	1.6	1.6	1.96	2.46	2.46	2.46
1 1/4"	42.16	--	--	--	1.52	1.52	1.52	1.52	1.63	1.63	2.01	2.01	2.49	3.12	3.12	3.12
1 1/2"	48.26	--	--	--	1.52	1.52	1.52	1.52	1.85	1.85	2.29	2.29	2.84	3.58	3.58	3.58
2"	60.32	--	--	--	1.85	1.85	1.85	1.85	2.31	2.31	2.87	2.87	3.56	4.47	4.47	4.47
2 1/2"	73.02	--	--	--	2.24	2.24	2.24	2.24	2.79	2.79	3.48	3.48	4.29	5.41	5.41	5.41
3"	88.9	--	2.16	2.16	2.74	2.74	2.74	2.74	3.43	3.43	4.24	4.24	5.23	6.58	6.58	6.58
4"	114.3	1.78	2.79	2.79	3.51	3.51	3.51	3.51	4.39	4.39	5.44	5.44	6.73	8.46	8.46	8.46
5"	141.3	2.64	3.45	3.45	4.34	4.34	4.34	4.34	5.43	5.43	6.73	6.73	8.3	10.1	10.1	10.1
6"	168.28	2.64	4.11	4.11	5.18	5.18	5.18	5.18	6.48	6.48	8.03	8.03	9.91	12.47	12.47	12.47
8"	219.08	3.43	5.33	5.33	6.73	6.73	6.73	6.73	8.43	8.43	10.41	10.41	12.9	--	--	--
10"	273	--	6.65	6.65	8.41	8.41	8.41	8.41	10.5	10.5	12.98	12.98	--	--	--	--
12"	323.9	--	7.9	7.9	9.96	9.96	9.96	9.96	12.5	12.5	15.39	15.39	--	--	--	--
14"	355.6	--	8.95	8.95	--	--	--	--	13.7	13.7	--	--	--	--	--	--
16"	406.4	--	10.1	10.1	--	--	--	--	15.6	15.6	--	--	--	--	--	--
18"	457.2	--	11.2	11.2	--	--	--	--	17.6	17.6	--	--	--	--	--	--
20"	508	--	12.4	12.4	--	--	--	--	19.5	19.5	--	--	--	--	--	--
24"	609	--	14.9	14.9	--	--	--	--	23.4	23.4	--	--	--	--	--	--



NOTE:

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Testing with or use of compressed air or gas in PVC pipe or fittings can result in explosive failures and cause severe injury or death.

Never test with or transport / store compressed air or gas in PVC pipe or fittings with compressed air or gas, or air over water boosters.

Only use PVC pipe for water or approved chemicals.

Refer to warnings in PPFA User bulletin 4-80 and ASTM D 1785.

NOTE:

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نوٹ: در وقت خرید اجناس کوثر به نشان تجاری توجه نمائید



Product Specifications

System: PVC SDR 35 Sewer Pipe

Scope: This specification cover PVC Standard Dimension Ratio (SDR) 35 PSM pipe for gravity sewer and surface water applications with a pipe stiffness of 46. This product is intended for gravity applications where the operating temperature will not exceed 140°F.

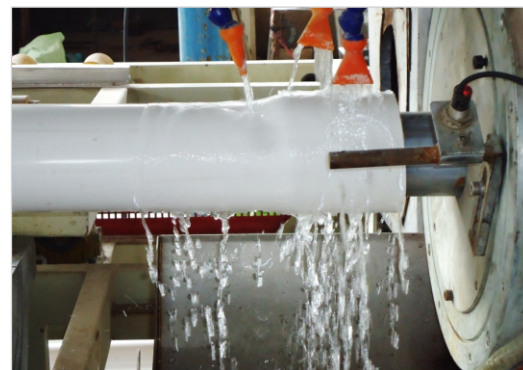
Specification: Pipe shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a cell class of 12364 as identified in ASTM D 1784. The requirements of this specification are intended to provide pipe suitable for non-pressure drainage and surface water.

PVC SDR 35 PSM pipe shall conform to ASTM D 3034 for gasket or solvent weld pipe with a minimum pipe stiffness of 46. Gaskets shall conform to ASTM F 477. The term “PSM” is not an acronym, but rather an arbitrary designation for a product having certain dimensions.

Installation shall comply with the latest installation instructions published by Kawsar Pipe and shall conform to all applicable plumbing, and building requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 1668. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The pipe shall be protected from chemical agents, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. Systems shall be hydrostatically tested after installation. **WARNING!** Never test with or transport/store compressed air or gas in PVC pipe or fittings.

Referenced Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 3034	PVC Gravity Sewer Pipe (SDR) 35 PS 46
ASTM D 2855	Joints For Sewer Pipe Using Solvent Cement
ASTM D 2564	Solvent Cements for PVC Pipe and Fittings
ASTM D 2321	Underground Installation of Thermoplastic Pipe(non-pressure applications)
ASTM F 477	Elastomeric Seals (Gaskets) For Joining Plastic Pipe
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe



PVC SDR 35 PSM PIPE

ASTM D 3034 & ASTM F 477

PVC SDR -35 GASKETED – PS 46						PVC SDR 35 SOLVENT WELD – PS 46					
Part No.	NOM. SIZE	LAYING LENGTH	WT.PER 100 FT. (LBS.)	AVG. OD (IN.)	MIN.WALL (IN.)	Part No.	NOM. SIZE	LAYING LENGTH	WT.PER 100 FT. (LBS.)	AVG. OD (IN.)	MIN.WALL (IN.)
S3D4W4	4”X13’	13’ -0”	110.4	4.215	.120	S3W4W3	4”X10’	10’ -0”	112.0	4.215	.120
S3D4W6	4”X20’	20’ -0”	109.7	4.215	.120	S3W4W6	4”X20’	20’ -0”	109.7	4.215	.120
S3D6W4	6”X13’	13’ -0”	249.6	6.275	.180	S3W6W3	6”X10’	10’ -0”	252.0	6.275	.180
S3D6W6	6”X20’	20’ -0”	247.0	6.275	.180	S3W6W6	6”X20’	20’ -0”	246.0	6.275	.180
S3D8W4	8”X13’	13’ 0”	451.0	8.400	.240						

Weight is a approximate and is for shipping purpose only.



Product Specifications

System: PVC D 2729 Sewer and Drain Pipe

Scope: This specification covers PVC D 2729 Sewer Pipe for drainage applications. This pipe is intended for drainage applications where the operating temperature will not exceed 140°F

Specification: Pipe shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a Cell Class of 12454 as identified in ASTM D 1784.

PVC D 2729 Sewer Pipe dimensions and physical properties shall conform to ASTM D 2729. All Pipes are manufactured in Pakistan.

Installation shall comply with the latest installation instructions published by Kawsar Pipe and shall conform to all applicable plumbing, building, and fire code requirements. Buried pipe shall be installed in accordance with ASTM 2321 and ASTM F 1668. Solvent cements joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. Systems shall be hydrostatically tested after installation.

WARNING! Never test with or transport/store compressed air or gas in PVC or pipe or fittings.

Referenced Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 2729	PVC Sewer Pipe
ASTM D 2564	Solvent Cements for PVC Pipe and Fittings
ASTM F 656	Primer for PVC pipe and Fittings
ASTM D 2321	Underground Installation of Thermoplastic Pipe(non-pressure application)
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe



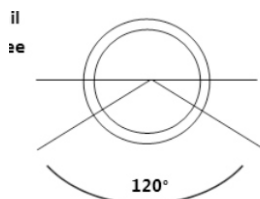
Note: Latest revision of each standard applies

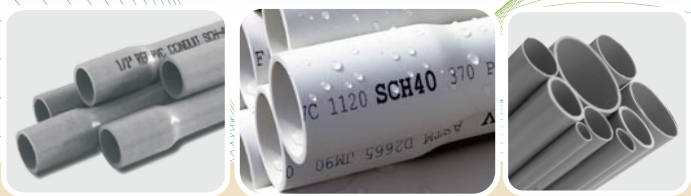
PVC Sewer and Drain ASTM D 2729

Nominal Size	Part No.	UPC Type	O.D. (In.)	Min. Wall (In.)	Ft/Skid	Wt/100' (Lbs.)
3"	KEPP3SD2729	Solid	3.250	0.070	810	52.8
3"	KEPP3SD2729-1	Perforated	3.250	0.070	810	52.8
4"	KEPP4SD2729	Solid	4.215	0.075	500	70.4
4"	KEPP4SD2729-1	Perforated	4.215	0.075	500	70.4

Perforation Detail

2-Hole 120 Degree





PVC Sewer and Drain Pipe

PVC ASTM D 2729 Pipe

SOLVENT WELD BELLED END					ASTM D 2729
Product Code	NOM. SIZE	AVG. OD (IN.)	MIN. WALL (IN.)	BELL DEPTH (IN.)	WT. PER 100 FT. (LBS.)
KEPP3D2729	3"	3.250	0.070	1.50	52.8
KEPP4D2729	4"	4.125	0.075	1.75	70.4

Perforated PVC ASTM D 2729 Pipe

SOLVENT WELD BELLED END					ASTM D 2729
Product Code	NOM. SIZE	AVG. OD (IN.)	MIN. WALL (IN.)	BELL DEPTH (IN.)	WT. PER 100 FT. (LBS.)
KEPP3D2729P	3"	3.250	0.070	1.50	52.8
KEPP4D2729P	4"	4.125	0.075	1.75	70.4



Perforated pipe is supplied with two rows of 1/8" diameter holes every five inches. Rows are parallel to the pipe axis and are 120° apart.

Weight is approximate and is for shipping purposes only.

Pipe listed in this section meets or exceeds the requirements of ASTM D 2729

Working Pressure BSS 3505

Maximum sustained working and field test pressure as per BSS 3505

Working Pressure

Class	Bar	Kgf/cm ²	lbf/in ²	Bar	Kgf/cm ²	lbf/in ²
B	6	6.12	87	9	9.18	130
C	9	9.18	130	14	13.77	195
D	12	12.25	173	18	18.38	259
E	15	15.30	217	23	22.95	325

Field Pressure

Class of Pipe		maximum 1h failure pressure
6 bar	Class-B	21.6 bar
9 bar	Class-C	32.4 bar
12 bar	Class-D	43.2 bar
15 bar	Class-E	54.0 bar

Short-term hydrostatic pressure resistance at 20°C maximum 1 hour failure pressure.



NOTICE

NOT FOR PRESSURE

Do not use PVC Sewer pipe for pressure applications. The use of sewer pipe in pressure applications may result in system failure and property damage.



WARNING

Failure to follow safety precautions may result in misapplication or improper installation and testing which can cause severe personal injury and / or property damage. Primers and cements are extremely flammable and may be explosive. Do not store or use near heat or open flame, or death or serious injury may occur. Solvent fumes created during the joining process are heavier than air and may be trapped in newly installed piping systems. Ignition of the solvent vapors caused by spark or flame may result in injury or death from explosion or fire. Read and obey all manufacturers' warnings and any instructions pertaining to primers and cements. Provide adequate ventilation to reduce fire hazard and to minimize inhalation of solvent vapors when working with Cements, primers and new piping systems.



PVC SEWERAGE PIPE

BS-5255, 4514, 4660 & 5481

BS 5255 Thermoplastic Waste Pipe

Nominal Size		Outside diameter (mm)		Wall Thickness (mm) Thermoplastic Waste Pipe	
Inch	mm	Min.	Max.	Min.	Max.
1 1/4	32	42.1	42.4	1.8	2.2
1 1/2	40	48.1	48.4	1.9	2.3
2	50	60.2	60.5	2.0	2.4

BS 4514 Soil & Ventilating Pipes

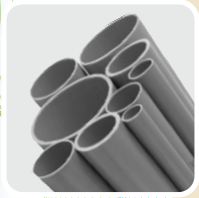
Nominal Size		Outside diameter (mm)		Wall Thickness (mm) Soil & Ventilating Pipes	
Inch	mm	Min.	Max.	Min.	Max.
3	82	88.7	89.1	3.2	3.8
4	110	114.1	114.5	3.2	3.8
6	160	168.0	168.5	3.2	3.8

BS 4660 AND 5481 Underground Sewerage

Nominal Size		Outside diameter (mm)		Wall Thickness (mm) Underground Sewerage			
				BS 4660		BS 5481	
Inch	mm	Min.	Max.	Min.	Max.	Min.	Max.
4	110	114.1	114.5	3.2	3.8	-	-
6	160	168.0	168.5	4.1	4.8	-	-
8	200	218.8	219.4	-	-	4.9	5.6
10	250	272.6	273.4	-	-	6.1	7.0
12	315	323.4	324.3	-	-	7.7	8.7
14	355	355.0	356.0	-	-	8.7	9.7
16	400	405.9	407.0	-	-	9.8	11.0
18	450	456.7	457.0	-	-	11.0	12.2
20	500	507.5	508.5	-	-	12.2	13.7

BS-5255, 4514, 4660 & 5481

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PVC PRESSURE PIPES BS-3505 & PSI -3051

Nominal Size	Outside Diameter		Wall Thickness												
			Class B, 6.0 bar			Class C, 9.0 bar			Class D, 12.0 bar			Class E, 15.0 bar			Class O
	min. mm	max. mm	Individual Value		Individual Value		Individual Value		Individual Value		Individual Value		Non Pressure		
		min. mm	KG/M WEIGHT	min. mm	KG/M WEIGHT	min. mm	KG/M WEIGHT	min. mm	KG/M WEIGHT	min. mm	KG/M WEIGHT	min. mm	max. mm		
3/8"	17.0	17.3	—	—	—	—	—	—	—	—	—	1.5	0.11	—	—
1/2"	21.2	21.5	—	—	—	—	—	—	—	—	—	1.7	0.15	—	—
3/4"	26.6	26.9	—	—	—	—	—	—	—	—	—	1.9	0.22	—	—
1"	33.4	33.7	—	—	—	—	—	—	—	—	—	2.2	0.32	—	—
1-1/4"	42.1	42.4	—	—	—	—	2.2	0.41	—	—	—	2.7	0.50	—	—
1-1/2"	48.1	48.4	—	—	—	—	2.5	0.54	—	—	—	3.1	0.65	1.8	2.2
2'	60.2	60.5	—	—	2.5	0.68	3.1	0.82	—	—	—	3.9	1.03	1.8	2.2
2-1/2"	75.0	75.3	—	—	3.0	1.01	3.9	1.20	—	—	—	4.8	1.31	1.8	2.2
3"	88.7	89.1	2.9	1.17	3.5	1.41	4.6	1.82	—	—	—	5.7	1.58	1.8	2.2
4"	114.1	114.5	3.4	1.78	4.5	2.32	6.0	3.03	—	—	—	7.3	2.22	2.3	2.8
5"	140.0	140.4	3.8	2.44	5.5	3.49	7.3	4.55	—	—	—	9.0	3.65	2.6	3.1
6"	168.0	168.5	4.5	3.46	6.6	5.01	8.8	6.57	—	—	—	10.8	5.51	3.1	3.7
7"	193.5	194.0	5.2	---	7.7	---	10.1	---	—	—	—	12.4	---	3.1	3.7
8"	218.8	219.4	5.3	5.30	7.8	7.72	10.3	10.05	—	—	—	12.6	12.17	3.1	3.7
9"	244.1	244.8	5.9	---	9.7	---	11.5	---	—	—	—	14.1	---	3.1	3.7
10"	272.6	273.4	6.6	8.26	9.7	11.97	12.8	15.59	—	—	—	15.7	18.89	3.1	3.7
12"	323.4	324.3	7.8	11.55	11.5	16.85	15.2	21.91	—	—	—	18.7	26.68	3.1	3.7
14"	355.0	356.0	8.5	13.87	12.6	20.27	16.7	26.49	—	—	—	20.5	32.16	3.6	4.2
16"	405.9	406.9	9.7	17.90	14.5	26.43	19.0	34.15	—	—	—	23.4	46.61	4.1	4.8
18"	456.7	457.7	11.0	22.80	16.3	33.34	21.4	43.33	—	—	—	—	—	4.6	5.3
20"	507.5	508.5	12.2	28.08	18.1	41.16	—	—	—	—	—	—	—	5.1	5.9
22"	558.3	559.3	13.4	34.02	22.9	49.80	—	—	—	—	—	—	—	5.3	6.1
24"	609.1	610.1	14.6	40.41	21.7	59.27	—	---	---	---	---	—	—	5.5	6.3



NOTE:

A

Testing with or use of compressed air or gas in PVC pipe or fittings can result in explosive failures and cause severe injury or death.

Never test with or transport / store compressed air or gas in PVC pipe or fittings with compressed air or gas, or air over water boosters.

Only use PVC pipe for water or approved chemicals.

Refer to warnings in PPFA User bulletin 4-80 and ASTM D 1785.

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DIN 8061 & 8062

Minimum Wall Thickness & Weight

Nominal Size	Series 1 2.5 Bar / Ventilation		Series 2 4 Bar / PN4		Series 3 6 Bar / PNG6		Series 4 10 Bar / PN10		Series 5 16 Bar / PN16	
	M/Thickness	Mass kg/m	M/Thickness	Mass kg/m	M/Thickness	Mass kg/m	M/Thickness	Mass kg/m	M/Thickness	Mass kg/m
20	-	-	-	-	-	-	-	-	1.5	0.137
25	-	-	-	-	-	-	1.5	0.174	1.9	0.212
32	-	-	-	-	-	-	1.6	0.264	2.4	0.342
40	-	-	-	-	1.8	0.334	1.9	0.350	3.0	0.525
50	-	-	-	-	1.8	0.422	2.4	0.552	3.7	0.809
63	-	-	-	-	1.9	0.562	3.0	0.854	4.7	1.290
75	-	-	1.8	0.642	2.2	0.782	3.6	1.220	5.6	1.820
90	-	-	1.8	0.724	2.7	1.130	4.3	1.750	6.7	2.610
110	1.8	0.95	1.9	1.160	3.2	1.640	5.3	2.610	8.2	3.900
125	1.8	1.08	2.5	1.480	3.7	2.130	6.0	3.340	9.3	5.010
140	1.8	1.21	2.8	1.840	4.1	2.650	6.7	4.180	10.4	6.270
160	1.8	1.39	3.2	2.410	4.7	3.440	7.7	5.470	11.9	8.170
200	1.8	1.74	4.0	3.700	5.9	5.370	9.6	8.510	14.9	12.800
225	1.8	1.96	4.5	4.700	6.6	6.760	10.8	10.800	16.7	16.100
250	2.0	2.40	4.9	5.650	7.3	8.310	11.9	13.200	18.6	19.900
280	2.3	3.11	5.5	7.110	8.2	10.400	13.4	16.600	20.8	24.900
315	2.5	3.78	6.2	9.020	9.2	13.200	15.0	20.900	23.4	31.500
400	3.2	6.10	7.9	14.500	11.7	21.100	19.1	33.700	29.7	50.800
500	4.0	9.38	9.8	22.400	14.6	32.900	23.9	52.600	-	-
630	5.0	14.70	12.4	35.700	18.4	52.200	30.0	83.200	-	-
710	5.7	18.90	14.0	45.300	20.7	66.100	-	-	-	-



NOTE:

A

Testing with or use of compressed air or gas in PVC pipe or fittings can result in explosive failures and cause severe injury or death.

Never test with or transport / store compressed air or gas in PVC pipe or fittings with compressed air or gas, or air over water boosters.

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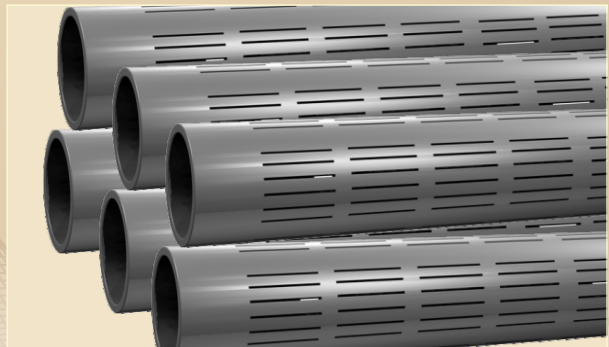
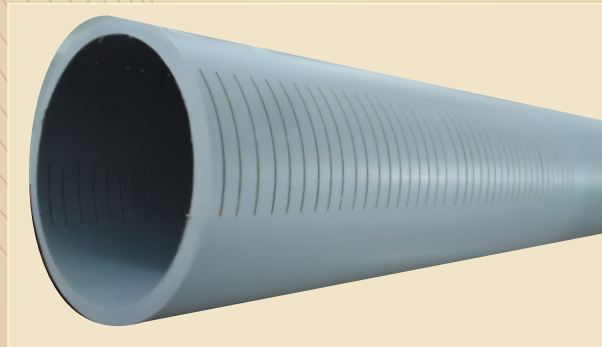
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uPVC PRESSURE PIPES | uPVC SEWERAGE PIPES | uPVC CONDUIT PIPES

uPVC WELL CASING SCREEN PIPES





PVC WELL CASING / SCREEN PIPES

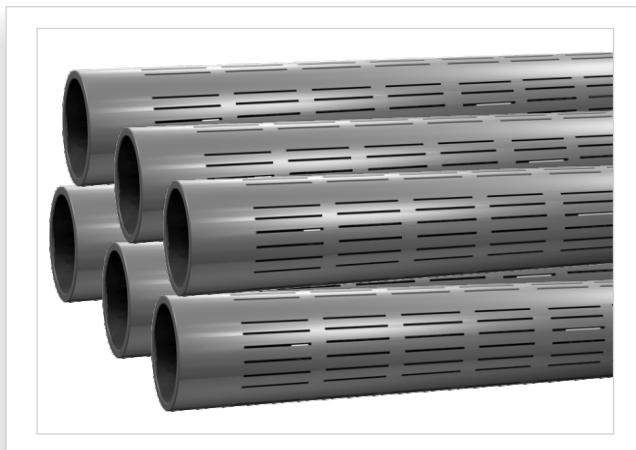
Kawsar Casing & Screen pipes ensure that the water well remains a perennial source of clean water. Some Year ago the choice was only was metal pipe and Screens. The disadvantages were corrosion of casing pipes, determination of screens and formation of bacteria, resulting in abandonment of wells and, even worse contamination of the water source.

Pvc well casing and screen is widely used because it is light strong, easy to install durable corrosion resistance and relatively inexpensive . The choice of any material depend upon its strength and weakness in relation to the particular intended use .Condition at a water well drilling site and within a borehole or generally aggressive. PVC casing and screens is easily able to with stand most condition but it is important for a driller engineer or hydro geologist to be aware of conditions or circumstances that might prejudice the integrity of PVC and consequently the bore hole. The aim is to provide a basis for the correct selection and handling of PVC casing and screen.

PVC is a plastic. it has a low compressive and tensile strength related to steel. It can be a softened by heat, deform by sudden or gradual stress and shattered by strong impact. Generally PVC casing is stronger than PVC screen, and thick wall Pvc casing is stronger than thin walled casing.

PVC is much more flexible than steel, therefore it should be supported both on the ground and in the boreholes. It strength can be reduced by prolonged exposure to strong sunlight. It is attacked by solvent such as vinyl chloride. Volatile organic chemicals can pass through PVC by a process that is not fully understood.

Today the modern technologies have enabled us to makes use of plastic pipes for this application.



نوت: در وقت خرید اجناس كوثر به نشان تجارتي توجه نمايد



ADVANTAGE

RESISTANCE TO EXTERNAL & INTERNAL PRESSURE:

Maximum hydraulic loading on casing pipes occurs during installation, grave packing, back filling and development of water wells. Hydrostatic pressure is caused by the column of drilling fluid of water present in the borehole . Rapid installation of a gravel pack or back fill increases the pressure on casing and screens pipes .Bridging and later collapse of gravel or backfill into the borehole can further subject casing pipes and screens pipes to shock loads. Poor mud control during water well development can also subject the casing to hydrostatic of differential pressure loading.

Kawsar screens pipes have the capacity to withstand hydraulic pressure. It is vital that the user makes a thorough assessment of each site requirement and only then select from our range of PVC casing and screen pipe.

RESISTANCE TO CORROSION

All Kawsar PVC pipes are resistance to corrosion. As PVC is inherently more resistance than conventional steel products to clogging and encrustation, at a fraction of the cost .Kawsar PVC screen pipes are generally unaffected by substances encountered in well: hence no deterioration in slots takes place. The raw material used for manufacturing fully complies with drinking water regulation and does not affect the quality of water.

LONG LIFE:

Well rehabilitation cost are minimized, as PVC screens are

inherently more resistance than conventional steel products to clogging and encrustation. PVC also outperforms stainless steel in highly corrosive environments, at a fraction of the cost .All screens are manufactured from PVC casing Pipes.

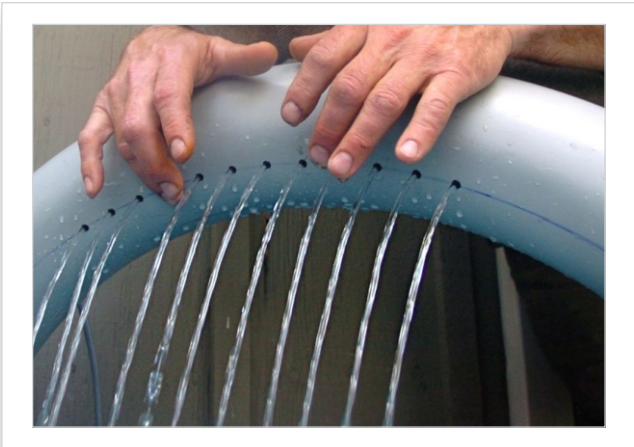
UNDER DRAIN

Slotted PVC pipe is ideal pipe for under drain pipe system

Application includes, but not limited to

1. Leachate collection system for solid waste landfills.
2. Drainage and Dewatering application.
3. Mining heap leach products.

PVC under drain pipe is supplied with precious - machine slots which provide greater intake capacity and continues, clog resistance, drainage of fluid, as compared to standards round hole as perforated pipe. Slotted under drain reduce entrance velocity into the pipe ,therebyreducing the possibility that solid will carried into the system. Slots row can generally be positioned symmetrically or asymmetrically around the pipe circumference , depending upon the application outside diameter are generally the same For PVC or Non- Corrugated polyethylene HDPE pipe. However the HDPE must be extruded with a thicker wall (and therefore a reduced cross sectional flow area) to obtain a comparable stiffness rating.





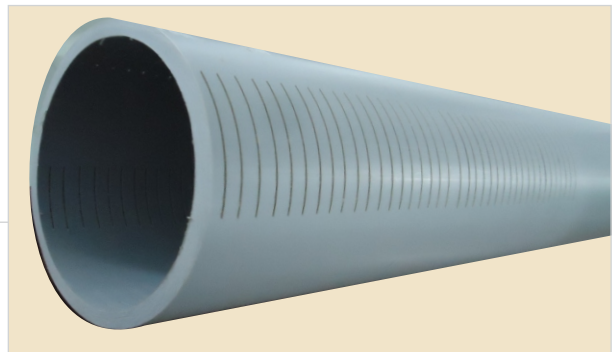
TYPES OF SCREEN DESIGN

Kawsar Slotted screens are obtained by making cuts all over the PVC pipe in order to exploit the screen collecting capability to maximum level. Slots are horizontal to pipes generatrices. Data show that horizontal opening are very hydraulically efficient and provide high collapse resistance thanks to the arc shapes of the material around them.

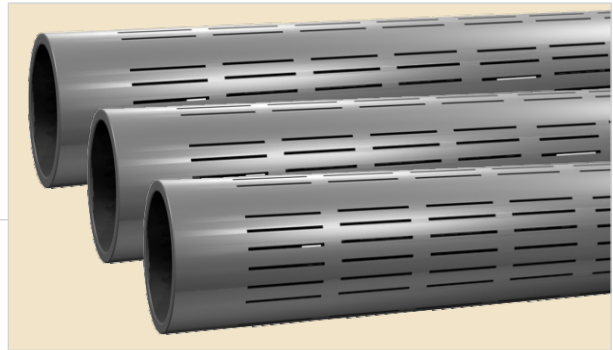
PVC slotted screens are usually used in fine soils to build up artesian wells, for drainage etc.

The product is manufactured according to customers need: the slots length and the number depend on the requested open area, moreover, cuts can be made on one, two, three or four sides of the pipes whereas the slots width is related to soil granulometry.

VERTICAL SCREEN



HORIZONTAL SCREEN

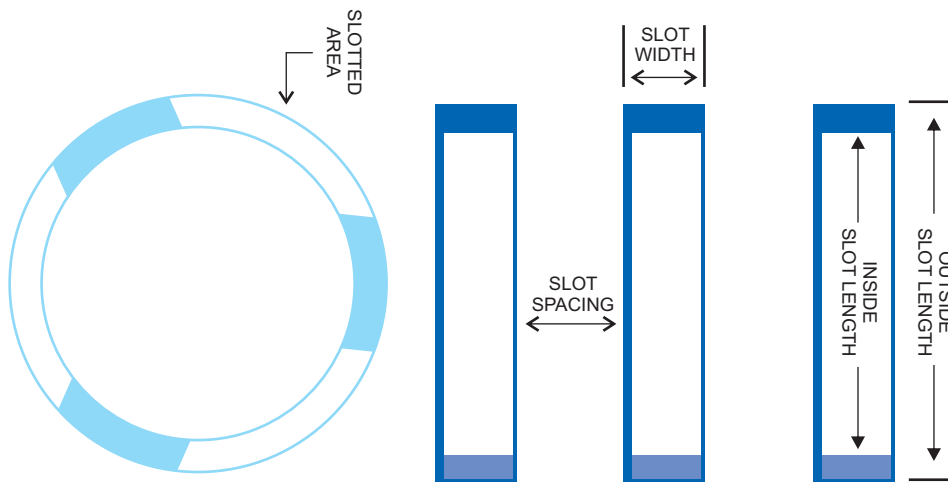
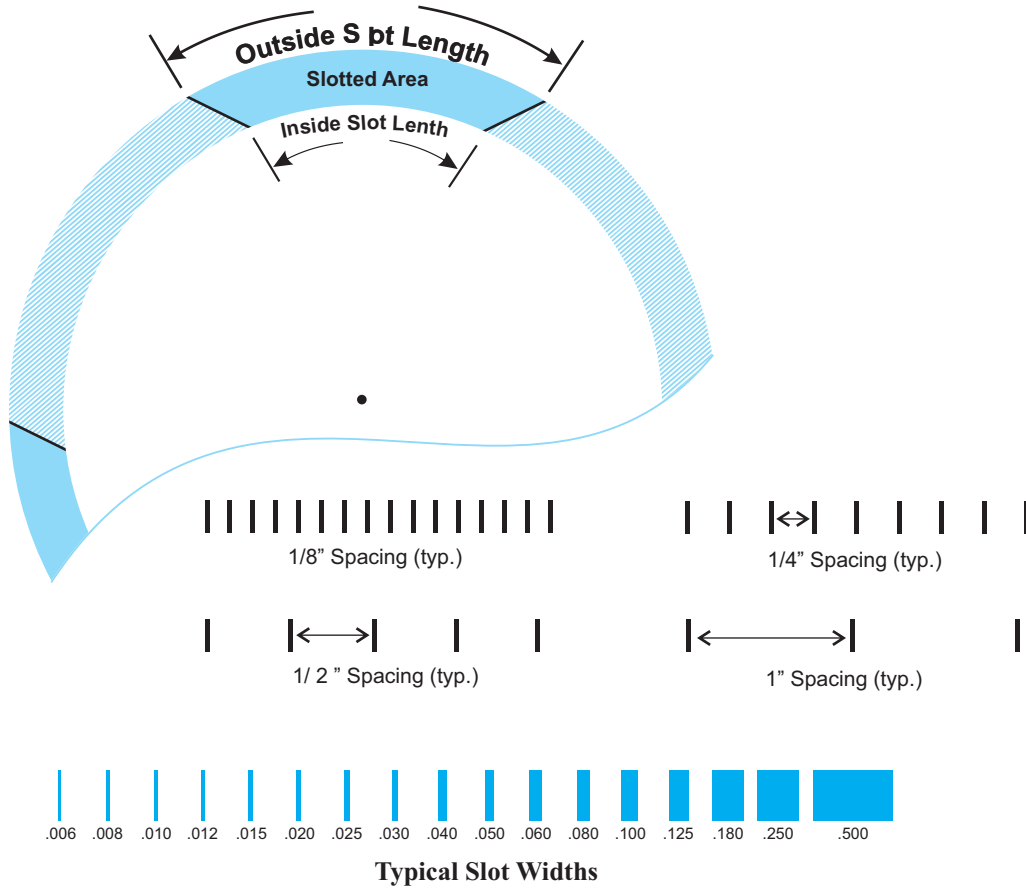


PERFORATED SCREEN





SLOTTED PIPE



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PVC SCREEN TRANSMITTING CAPACITY - SCHEDULES 40 & 80

PVC SCHEDULE 40 SCREEN TRANSMITTING CAPACITY - STD CONSTRUCTION						
Transmitting Capacity (gallons Per Minute Per Foot)						
Pipe Size (inches)	Slot Spacing (inches)	Standard Slot Opening (inches)				
		0.040	0.050	0.060	0.100	0.125
2	3/16	2.94	3.52	4.06	5.82	6.70
2-1/2	3/16	2.78	3.33	3.83	5.50	6.32
3	3/16	3.92	4.70	5.41	7.76	8.93
4	1/4	3.65	4.42	5.13	7.57	8.84
5	1/4	4.04	4.88	5.67	8.37	9.77
6	1/4	6.16	7.44	8.64	12.75	14.88
8	1/4	6.96	8.41	9.77	14.42	16.82
10	1/4	8.21	9.92	11.52	17.01	19.84
12	1/4	10.58	12.79	14.85	21.92	25.58
14	1/4		15.50	18.00	26.57	31.00
16	1/4		15.89	18.44	27.24	31.78

PVC SCHEDULE 40 SCREEN TRANSMITTING CAPACITY - STD CONSTRUCTION						
Transmitting Capacity (gallons Per Minute Per Foot)						
Pipe Size (inches)	Slot Spacing (inches)	Standard Slot Opening (inches)				
		0.040	0.050	0.060	0.100	0.125
2	3/16	2.58	3.08	3.55	5.09	5.86
2-1/2	3/16	2.45	2.94	3.38	4.85	5.58
3	3/16	3.43	4.11	4.73	6.79	7.81
4	1/4	3.46	4.19	4.86	7.17	8.37
5	1/4	4.62	5.58	6.48	9.57	11.16
6	1/4	5.20	6.28	7.29	10.76	12.56
8	1/4	5.16	6.24	7.24	10.70	12.48
10	1/4	6.41	7.75	9.00	13.29	15.50
12	3/8		9.41	11.03	16.84	20.00
14	3/8		8.97	10.52	16.05	19.07
16	3/8			11.54	17.62	20.93

PVC Well Casing ASTM F 480					
PVC SCHEDULE 40 (WHITE)	BELL END WELL CASING	PVC 1120	ASTM F 480		
PART NO.	NOM. SIZE	AVG. OD (IN.)	MIN. WALL (IN.)	BELL DEPTH (IN.)	WT. PER MTR
KEEP2GS4	2"	2.75	0.154	4.00	1.045
KEEP21/2GS4	2 1/2"	2.875	0.20	4.00	1.650
KEEP3GS4	3"	3.500	0.216	4.00	2.160
KEEP4GS4	4"	4.500	0.23	5.00	3.074
KEEP6GS4	6"	6.625	0.280	6.50	5.414
KEEP8GS4	8"	8.625	0.32	7.00	8.154



Pvc Pressure And Strength Tables

COLLAPSE PRESSURE	BURST PRESSURE	TENSILE PRESSURE
Pounds per square inch of external hydrostatic pressure that can be safely applied.	Pounds per square inch of internal hydrostatic pressure that can be safely applied.	The suspended weight the threaded joint can sustain in a vertical position without causing stretching or failure.

Testing methods and procedures used are in compliance with ASTM F480 standards for thermoplastic pipe in all applicable areas.

Pipe Size	Collapse Pressure (psi)*		Burst Pressure (psi)*		Tensile Strength (lb)**	
	Sch. 40	Sch. 80	Sch. 40	Sch. 80	Sch. 40	Sch. 80
0.50"	1,100	2,700	300	425	264	344
0.75"	630	1,590	240	345	362	487
1.00"	520	1,270	225	315	581	727
1.25"	300	770	185	260	859	878
1.50"	220	590	165	235	954	1,225
2.00"	140	390	140	200	942	1,542
2.50"	180	450	150	210	2,093	2,890
3.00"	120	320	130	185	2,786	3,839
4.00"	70	210	110	160	4,119	5,82.
5.00"	50	150	95	145	5,491	6,864
6.00"	40	140	90	140	7,165	11,384
8.00"	30	100	80	125	10,384	17,332
10.00"	20	85	70	115	15,086	25,124
12.00"	16	80	65	115	19,548	34,430
14.00"	15	80	65	110	20,894	37,651
16.00"	15	70	65	110	26,864	48,033

Notes:

1. Values noted with an asterisk (*) are based on minimum wall & include a 50% safety factor.
2. Values noted with a double asterisk (**) are recommended dry hanging weight for threaded PVC schedules 40 & 80. These values are calculated based on the minimum cross sectional areas of either the box or pin thread portion of the joint after machining. The resulting minimal area was multiplied by 7,000 psi tensile strength per ASTM D-1784 to yield the recommended dry hanging weight. even through these calculated values are lower than actual Johnson screens test data. Johnson recommends not to exceed the above values for well construction.

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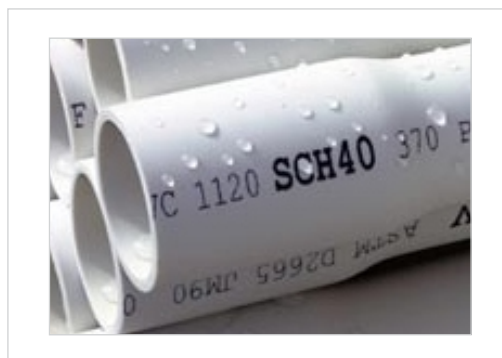


JOINTING TYPES

THREADED JOINTS



BELL END JOINTS



INSTALLATION & JOINTING PROCEDURE:

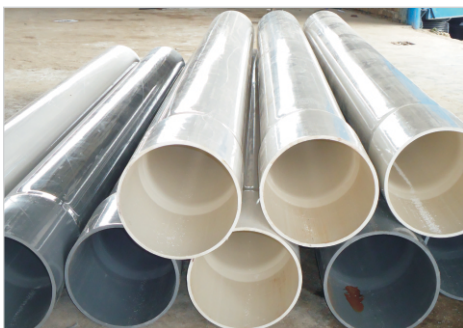
Arrange the pipe assembly on the ground.

- Fix the centering guides the pipes once in every 15 meters (minimum), just below the neck of the socket, with the open end of the centering guides facing upwards while lowering .
Always use a plain casing pipe (sand trap) for the first pipe to be lowered, with a conical end cap(Bull-nose) blanking the spigot end of the pipe. Fill this pipe with water or drilling fluid before lowering into the well.
- Wash the remain borehole thoroughly with fresh drilling fluid (Bentonite Solution) for 40 – 45 minutes from the bottom , keeping the specific gravity of the drilling fluid to below 1.4
This will prevent heavy sedimentation at the bottom of the borehole and also easy lowering of the assembly.
- To obtain better result, ensure that the reamed borehole is at least 15 to 20cms more than the outside diameter of the casing pipe.
- The Sand trap is the lowest pipe in a tubewell and is the first to be selected. Fit this pipe with an end plug (cap) and centering guide.
- Lower the sand trap into the borehole and hold with a split clamp with the socketed end facing upward.
- The next pipe, which is either a screen pipe or a plain pipe(depending on lithology of well) is fitted to sand trap by screwing them together.



- Jointing pipe can be done either by strap wrench or with manila rope. Never used a chain range. Clean the threads to remove mud or burrs using wire brush. Soap solution maybe used to lubricate the joints Avoid grease or waste oil.
- Fit the socked end of the next pipe (Which can be a screen /plain casing) with the fitting cap.
- Connect the lifting cap securely with the wire rope of the drilling fram. Use winch of drilling machine to lift the threaded pipe string.
- This pipe string is jointed to the pipe already lowered into the borehole.
- Center the assembly pipe string and permit it to descend into the borehole by releasing the split clamp, Fill the pipe with water or mud solution to equalize pressure.
- Repeat the operation till all the casing and screens are lowered according to the lithology of the well. The time needed to make each joint is less than 5 minutes.
- Lowering time can be reduced by the casing and screens on the ground to make additional lengths. Do this correctly as per lithology of the well to avoid wrong placement of screens in the bore well.
- Do not set the lowered pipe assembly at the bottom of the borehole. Ensure at least 10 feet of free bore below the sand trap. This help the lowered casing and screen pipes to remain hanging and achieve a vertical installation.
- Centering guides should always be fixed at a minimum interval of 1.5 meter to ensure uniform gravel asking around the casing and screen pipes.

KAWSAR Well casing are made available up on orders within shortest possible time period in vertical & horizontal slots along the length, however customized screening pipes provided with pores can also be produced fulfilling all requirements while considering requisite technical parameters.

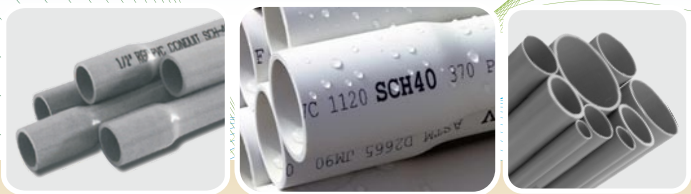




uPVC PRESSURE PIPES | uPVC SEWERAGE PIPES | uPVC CONDUIT PIPES

uPVC CONDUIT PIPES





PVC (Polyvinyl Chloride) Electrical Conduit

PVC conduit is the lightest in weight compared to other conduit materials, and usually lower in cost than other forms of conduit. It is available in three different wall thicknesses, with the thin-wall variety only suitable for embedded use in concrete, and heavier grades suitable for direct burial and exposed work. The various fittings made for metal conduit are also made for PVC. The plastic material resists moisture and many corrosive substances, but since the tubing is non-conductive an extra bonding (grounding) conductor must be pulled into each conduit. PVC conduit may be heated and bent in the field. Joints to fittings are made with slip-on solvent-welded connections, which set up rapidly after assembly and attain full strength in about one day. Since slip-fit sections do not need to be rotated during assembly. Since PVC conduit has a higher thermal coefficient of expansion than other types, it must be mounted so as to allow for expansion and contraction of each run. Care should be taken when installing PVC underground in multiple or parallel run configurations due to mutual heating effect of cable

KAWSAR meets the requirements prescribed by the following standards organizations:

- 1) National Electrical Manufacturer's Association (NEMA - USA)
- 2) American Society for Testing & Material, (ASTM)
- 3) British Standards Conduits for Electrical Installation.

Product Specification



SCOPE

This specification designates general requirements for 5" through 6" diameter polyvinyl chloride (PVC) Electrical Conduit and Power Duct pipe for the conveyance of electrical wires in above/below ground and/or indoor applications.

KAWSAR offers a complete line of Electrical Conduit and Power Duct pipe products which include: Schedule 40 and 80 Conduit (NEMA TC-2, ANSI/UL651), Encased and Direct Burial Conduit (ASTM F512, NEMA TC-6 & 8 and/or ANSI/UL 651A), and Type C Telephone Duct. All KAWSAR Electrical Conduit and Power Duct pipe products are offered in 4 meters laying lengths (10 foot and 20 foot lengths are also manufactured on special order by customer. This means that more ground can be covered during installation while eliminating the cost of unnecessary joints.



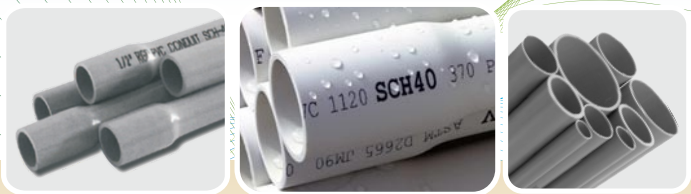
PVC MATERIALS

KAWSAR Schedule 40 and 80 Electrical Conduit shall be made from quality PVC resin, compounded to provide physical and mechanical properties as defined in ANSI/ UL 651 and NEMA TC-2.



Reference Standards:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 1785	PVC Plastic Pipe, Schedule 40
ASTM D 2466	PVC Plastic Fittings, Schedule 40
ASTM D 2564	Solvent Cements for PVC Pipe and Fittings
ASTM D 2774	Underground Installation of Thermoplastic Pressure Piping
ASTM F 656	Primers for PVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe

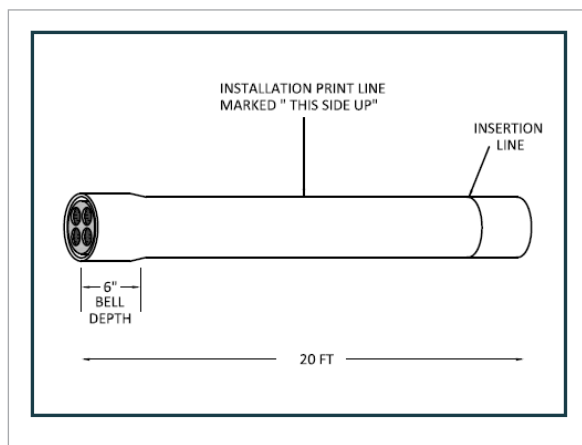


Multi Conduit PVC Pipes

These guidelines should help you install Multi Conduit in the simplest way possible and should be read in their entirety before attempting to install the system to have as smooth an installation as possible.

To be certain that the conduit has been properly placed, the conduit work should be inspected throughout the construction period by a trained inspector who is completely familiar with the job and construction specifications. The inspector should confirm the Multi Conduit run is in the correct location, proper conduit depth is maintained, the trench bottom is level, all joints are properly made, horizontal and vertical alignment is maintained and select backfill is used.

Multi Conduit is packaged from the factory in bundles. Each section of pipe is shipped with a protective wrap on both ends which prevents any foreign material from entering the Multi Conduit before being installed in the ground.



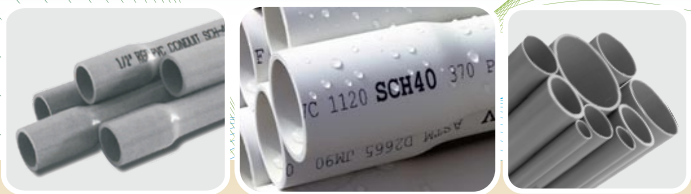
Standard PVC Duct

The standard 4-way or 3-way PVC Multi Conduit is available in several configurations. We can provide a boreable 4-way or 3-way Multi Conduit with locking sch-40 outer duct.



Product Code	No.s of Duct	Description	Max. inner Dia	Min. Wall Thickness
KEEC4MGS4	3 Cell	3" SCH-40 with three inner ducts	3.28	0.216
KEEC4MGS4	4 Cell	4" SCH-40 with three inner ducts	4.26	0.237

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APPLICATIONS

- Underground and Above
- Ground Electric Supply
- Data Transmission
- Telecommunication
- Power Transmission lines

ADVANTAGES

- Reliable Joints & easy pull through
- Light weight Easy to Install
- Fire Resistance
- Non Magnetic
- Non Corrosive Safety

KAWSAR produces a wide variety of conduit pipe suitable for most applications. KAWSAR Schedule 40 and 80 products are rated for 90° C conductors and conform to ANSI/UL 651 and NEMA TC-2. This conduit is designed with safety in mind and can be used in a variety of everyday applications. KAWSAR offers telephone duct for networking applications. KAWSAR telephone duct is made in compliance with ASTM F512 and/or other specified specifications for consistency and safety.

KAWSAR ELECTRICAL CONDUIT PIPE

KAWSAR electrical products are suitable for use as electrical Conduit and/or power duct. Provisions must be made for expansion and contraction of the pipe structure. The bell section shall be designed to meet the requirements of the appropriate specification for the pipe. Sizes and dimensions shall be as shown in this specification.

EXPANSION AND CONTRACTION

PVC non-metallic conduit will expand and contract with temperature variations. The amount of movement due to temperature changes can be determined from the chart on the following pages. The coefficient of thermal expansion of KAWSAR PVC conduit is 3.0×10^{-5} in/in/°F. If major temperature variations are expected, the use of expansion joints should be considered and should be installed in accordance with the engineer's design

CORROSION RESISTANCE

KAWSAR Electrical Conduit unaffected by electrolytic or galvanic corrosion, or any known corrosive soil or water condition.

SMOOTH INTERIOR

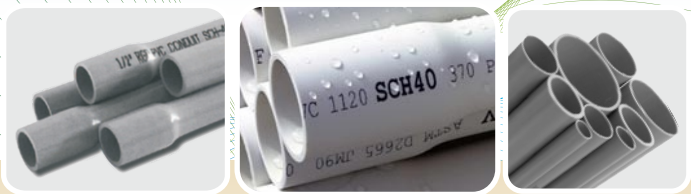
This PVC pipe has a smooth interior that allows for wires to be pulled through easily without hanging or binding. KAWSAR pipe is carefully designed and manufactured to provide an interior surface that will not nick or tear the wiring insulation.

SCHEDULE 40 AND SCHEDULE 80 CONDUIT

KAWSAR's Schedule 40 and Schedule 80 PVC rigid nonmetallic conduit is designed and produced for use in both above ground and underground installations.

KAWSAR'S PVC SCHEDULE 40 AND 80 CONDUIT OFFERS:

- Highest quality control standards
- Rated for use with 90° C conductors
- Ultraviolet protection
- Solvent cemented joints
- Smooth solid wall
- Compliance to ANSI/UL 651 and NEMA TC-2
- Light weight
- High impact and deformation properties
- Superior Dielectric Strength
- Easy installation



KAWSAR Rigid PVC Electrical Plastic Tubing (EPT) & Conduit(EPC-40 and EPC-80)

Table No: 1. NEMA TC-2 Dimension

Nominal Pipe Size	Outside Dia	EPT-A-PVC		EPT-40-PVC		EPT-80-PVC	
		W/thick	N.Weight	W/thick	N.Weight	W/thick	N.Weight
Inch	mm	mm	Kgs/m	mm	Kgs/m	mm	Kgs/m
½"	21.34	1.52	0.155	2.77	0.248	3.73	0.309
¾"	26.67	1.52	0.197	2.87	0.329	3.91	0.418
1"	33.40	1.52	0.250	3.38	0.483	4.55	0.614
1 ¼"	42.16	1.78	0.365	3.56	0.652	4.85	0.850
1 ½"	48.26	2.03	0.468	3.68	0.779	5.08	1.030
2"	60.32	2.54	0.717	3.91	1.04	5.54	1.430
2½"	73.02	2.79	0.952	5.16	1.65	7.01	2.180
3"	88.9	3.18	1.310	5.49	2.160	7.62	2.900
4"	114.30	3.81	2.000	6.02	3.070	8.56	4.260
5"	141.30	---	---	6.55	4.17	9.52	5.910
6"	168.28	---	---	7.11	5.410	10.97	8.130
8"	219.08	---	---	8.18	8.143	12.70	12.40

EPT-A-PVC Electrical Plastic Tubing for encasement in concrete | EPC 40 Electrical Plastic Conduit for normal duty application | EPC 80 Electrical Plastic Conduit for heavy-duty application

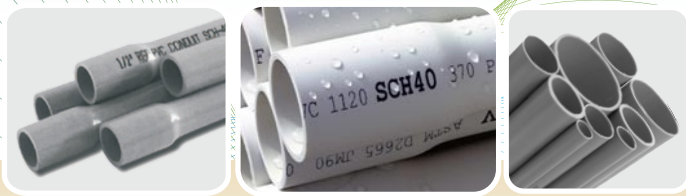
KAWSAR Rigid PVC Utilities Duct for Underground Installation. NEMA TC-6 and ASTM F 512 Dimension

Table No: 2.

Nominal Pipe Size	Outside Dia	PVC Type EB 20		PVC Type DB 60	
		W/thick	N.Weight	W/thick	N.Weight
Inch	mm	mm	Kgs/m	mm	Kgs/m
2"	60.32	1.52	0.463	1.52	0.465
3"	88.90	1.55	0.702	2.34	1.000
4"	114.30	2.08	1.170	3.07	1.650
5"	141.30	2.62	1.710	3.86	2.500
6"	168.28	3.18	2.530	4.62	3.570

Type EB for Encased Burial in concrete Type DB for Direct Burial without Concrete Pipe Length: Standard 6 meters (6m)

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PROPERTIES

MECHANICAL PROPERTIES

	ASTM	TYPICAL VALUE
Specific Gravity	D792	1.4 –1.
Tensile Strength (psi) @ 73.4 F	DN 638	75,000
Izod Impact t-ftlbs/ in of notch	D256	0.65 –1.50
Flexural Strength (psi)	D790	12,500
Comprehensive Strength (psi)	D695	9000
Hardness (Durometer D)	D2240	95



THERMAL PROPERTIES

	ASTM	TYPICAL VALUE
Coefficient of Thermal Expansion – in/in C	D696	5.13 x 10-5
Coefficient of Thermal Expansion – in/in OF	D696	3.0 x 10-5
Deflection Temp. OF Under Load @ 264 psi	D648	140 OF
Thermal Conductivity BTU (hr) (ft) (OF/In)	C177	1.3



ELECTRICAL PROPERTIES

	ASTM	TYPICAL VALUE
Dielectric Strength Volts/mil	D149	1,100
Dielectric Constant 60 CPS @ 30 C	D150	4,00
Power Factor 60CPS @ 30C	D150	1,93



Support of Kawsar PVC Conduit in Above Ground Installations

Size	Maximum Space Between Supports (ft)
1 1/4 - 2	5
2 1/2 - 3	6
3 1/2 - 5	7
6	8



KAWSAR RIGID PVC EXTRA STRENGTH UNDERGROUND INSTALLATION

NEMA TC-8 and ASTM F 512 Dimension

Trade Size	Metric Designators	Average Outside Dia	Type EB-35		Type DB-100		Type DB-120	
			W/thick	N.Weight	W/thick	N.Weight	W/thick	N.Weight
			mm	mm	Kgs/m	mm	Kgs/m	mm
1"	27	33.40	--	--	--	--	1.52	0.251
1 1/2"	41	48.26	--	--	--	--	1.52	0.369
2"	53	60.32	1.52	0.465	--	--	1.96	0.576
3"	78	88.90	1.93	0.847	2.84	1.160	3.00	1.290
4"	103	114.30	2.54	1.390	3.68	1.930	3.91	2.050
5"	129	141.30	3.20	2.090	4.55	2.940	4.85	3.120
6"	155	168.28	3.86	3.020	5.41	4.170	5.77	4.420

BS-6099

KAWSAR PVC Electrical Conduit Pipes as per BS-6099

Nominal Size	Outer Diameter (mm)		Wall Thickness	
	Min.	Max.	Min.	Max.
1/2	17.0	17.3	0.96	1.16
3/4	21.2	21.5	1.09	1.29
1	26.6	26.9	1.16	1.36
1 1/4	33.4	33.7	1.44	1.67
1 1/2	42.1	42.4	1.60	1.84
2	60.2	60.5	1.70	1.90
3	88.7	89.1	1.80	2.00
4	114.1	114.5	1.90	2.10

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Pvc Electrical Conduit Pipe Specification BS-6099

Nominal Dia	Mean Outside Diameter Mm		Thickness mm	Thickness Allowance	Weight Kg/m
	Min.	Max			
1/2"	17.0	17.0	1.04	±.025	0.086
3/4"	21.0	21.5	1.25	±.025	0.125
1"	26.6	26.9	1.33	±.025	0.173
1 1/4"	33.4	33.7	1.51	±.025	0.245
1 1/2"	42.1	42.2	1.86	±.025	0.398
2"	60.2	60.5	2.04	±.025	0.612
3"	89.7	89.1	1.8	±.025	0.798
4"	114.1	114.5	1.9	±.025	1.032

Electrical conduit pipes are available in 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 3", 4" Diameter and 3 meter lengths.

Non Pressure Pvc For Drain Sewer Pipe Specifications

Nominal Dia	Mean Outside Diameter Mm		Thickness mm	Thickness Allowance	Weight Kg/m
	Min.	Max			
3"	88.7	89.1	1.8	±.01	0.797
4"	114.1	114.5	1.8	±.01	1.029
5"	140.0	140.4	2.5	±.01	2.125
6"	168.0	168.5	3.0	±.01	2.375

Pvc Electrical Conduit Pipe Specification

Dielectric constant Test cycle : 50 c/s	5.1 - 5.25
Dielectric Power Factor Test Cycle: 50 c/s Shoering - Bridge Method	0.1 - 0.146
Specific (volume) resistance Electronic insulation resistance A1 DC 1000 Volt	1.27 x 10 ¹³ Ω - CM
Critical Supported Voltage AC 50 C S 11 KV One Minute	No Change



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uPVC PRESSURE PIPES | uPVC SEWERAGE PIPES | uPVC CONDUIT PIPES

DESIGN AND ENGINEERING DATA OF uPVC PIPES





Fluid Flow Properties

Gravity Flow Manning Roughness Factor ("Value)

Fluid velocity, pipe size and hydraulic slope for gravity drainage can be determined using the Manning "N" value. This coefficient relates to the interior wall smoothness of pipe and is used for liquids with a steady flow, at a constant depth, in a prismatic open channel. The manning's equation is shown below.

$$V = 1.486 \frac{R^{2/3} S^{1/2}}{N}$$

Where:

V= Velocity of flow, ft./second

N= Manning's value

R= hydraulic radius, ft. obtained by dividing the cross sectional area of flow by the wetted perimeter of the pipe in contact with the flow. R is a special case for v with pipes either 1/2 full of full:

R= Inside diameter / 4, in feet

S= Upstream elevation – Downstream elevation (ft. /ft.)
Pipe length

Example 1:

2" diameter schedule 40 PVC,

Flow full 30 foot pipe run, 7.5 inch drop

$$S = \frac{17.5" - 10.0"}{30 \text{ ft.}} = 0.0208 \text{ ft./ft.}$$

$$R = \frac{2.067"}{4} = 0.043 \text{ ft.}$$

$$V = \frac{1.486 R^{2/3} S^{1/2}}{N}$$

Manning's "N" value is generally accepted as 0.0009 for Designing gravity sewer system

$$V = \frac{1.486 (0.043)^{2/3} (0.0208)^{1/2}}{0.009}$$

$$V = 2.9 \text{ ft. /second}$$

Example 2:

4" diameter schedule 40 ABS, flowing 1/2 full

10 foot pipe run, 1.5 inch drop

$$S = \frac{20" - 18.5"}{10 \text{ ft.}} = 0.0125 \text{ ft. /ft.}$$

$$R = \frac{4.026"}{4} = 0.0839 \text{ ft.}$$

Assume "N" to be 0.010

$$V = \frac{1.486 (0.0839)^{2/3} (0.0125)^{1/2}}{0.010}$$

$$V = 3.2 \text{ ft. /second}$$

It is widely recommended that the flow velocity in sanitary sewer system to be equal to or greater than 2.0 feet per second for self-cleaning drain lines.

Laboratory tests have shown that the "N" value for PVC pipe ranges from .008 to .012. The table below shows "N" values for other piping materials.

Piping Material	"N" Values
Cast Iron	.011- .015
Finished Concrete	0.11 - .015
Unfinished Concrete	.013 - .017
Corrugated Metal	.021 - .027
Glass	.009 - .013
Clay	.011 - .017

Fluid Flow Rate

Calculation of Volume Flow Rate:

$$Q = aV$$

Where:

a = Cross sectional area of flow, ft.²

V = Flow Velocity, ft./sec

Q = Volume flow rate, ft³/sec

Example 1:

2" Schedule 40 PVC

Where:

Di = inside diameter of pipe in inches

$$A = \frac{\pi d_i^2}{4} = \frac{\pi (2.06712)^2}{4} = 0.0233 \text{ ft}^2$$

$$V = 2.9 \text{ ft./sec}$$

$$Q = 0.0233 \times 2.9 = 0.0676 \text{ ft}^3/\text{sec}$$

$$Q = \frac{0.0676 \text{ ft}^3}{\text{Sec}} \times 7.48 \frac{\text{gal}}{\text{ft}^3} \times 60 \frac{\text{sec}}{\text{min}} = 30.3 \frac{\text{gals}}{\text{min}}$$

Example 2:

4" Schedule 40 PVC

$$a = \frac{1}{2} (\pi d_i^2) = \frac{\pi (4.02612)^2}{4 \times 4} = 0.0442 \text{ ft}^2$$

$$V = 3.2 \text{ ft./sec}$$

$$Q = 0.0442 \times 3.2 = 0.141 \text{ ft}^3/\text{Sec}$$

$$Q = \frac{0.0442 \text{ ft}^3}{\text{Sec}} = \frac{0.141 \text{ gal}}{\text{ft}^3} \times \frac{60 \text{ sec}}{\text{min}} = \frac{63.5 \text{ gals}}{\text{min}}$$



Pressure Flow

Friction loss through PVC pipe is normally obtained by using the Hazen-Williams equation shown below for water:

$$F = 0.2083 \times \left(\frac{100}{C} \right)^{1.852} \times \frac{Q^{1.852}}{di^{4.8655}}$$

Where:

F = friction head loss in feet of water per 100 feet of pipe
 C = constant for inside pipe roughness (C = 150 for PVC pipe)
 Q = flow in U.S. gallons per minute
 Di = inside diameter of pipe in inches

Water Velocities

Water velocities in feet per second may be calculated as follows:

$$V = 0.408709 \frac{Q}{di^2}$$

Where:

V = velocity in feet per second
 Q = flow in U.S. gallons per minute
 Di = inside diameter of pipe in inches

Friction Loss Through Fittings

The friction loss through fittings is considered to be equivalent to the loss through a certain number of linear feet of pipe of the same diameter as the fittings. To determine the loss through a piping system, add together the number of "equivalent feet" Calculated for the fittings in system.

The chart below shows approximate friction losses, in equivalent feet, for variety of Schedule 40 & 80 PVC fittings of different sizes.

Approximate Friction Loss For PVC Fittings In Equivalent Feet Of Straight Pipe

Fitting	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"	8"
Tee (Run)	1.0	1.4	1.7	2.3	2.7	4.3	5.1	6.2	8.3	12.5	16.5
Tee (Branch)	4.0	5.0	6.0	7.3	8.4	12.0	15.0	16.4	22.0	32.7	49.0
90° Elbow	1.5	2.0	2.5	3.8	4.0	5.7	6.9	7.9	12.0	18.0	22.0
45° Elbow	.80	1.1	1.4	1.8	2.1	2.6	3.1	4.0	5.1	8.0	10.6
Male/Female Adapter	1.0	1.5	2.0	2.75	3.5	4.5	5.5	6.5	9.0	14.0	----

The table on page shows friction heads in feet and friction losses in psi for schedule 40 pipe. It also shows the gallons per minute (GPM) and velocities (in feet per second) for various pipe sizes.





Water Hammer

Water hammer is a term used to describe the sudden increase in pressure created by quickly stopping, starting, or changing the direction of the flow of fluid in piping system. Typical actions which cause water hammer are:

1. Quick closing a valve.
2. Quick Opening a valve.
3. Starting pumps with an empty discharge line.
4. A high speed wall of liquid (such as starting a pump) suddenly changes direction (such as going through a 90° elbow).
5. Moving entrapped air through the system.

The pressure increase generated must be added to the fluid pressure already existing in the piping system to determine the total pressure the system must withstand. CAUTION! If water hammer is not accounted for, the sudden pressure surge could be enough to burst the pipe, or break the fittings or valves.

Taking the following measures will help prevent problems:

- (1) Keep fluid velocities under 5 feet per second.
- (2) Use actuated valves with controlled opening and closing speeds.
- (3) Instruct operator of manual valves on the proper opening and closing speeds.
- (4) When starting a pump, partially close the valve in the discharge line to minimize the volume of liquid accelerating through the system. Fully open the valve after the line is completely filled.
- (5) Use a check valve in the pipe line, near the pump to keep the line full.
- (6) Use air relief valves to control the amount of air that is admitted or exhausted throughout the piping system.
- (7) Design the piping system so that the total pressure (operating plus water hammer surge) does not exceed the pressure rating of the lowest rated of the lowest rated component in the system.

How To Use The Nomograph On The Following Page.

1. Liquid Velocity (feet/second), pipeline length (feet), and valve closing time (seconds) must be known.
2. Place a straight edge on the liquid velocity in pipe (line A) and the pipeline length (line D).
3. Mark intersection of straight edge with pivot line (line C).
4. Place straight edge on mark just placed on pivot line (line C) and on valve closing time for valve being used (line A).
5. The intersection of the straight edge with the pressure increase line (line B) is the liquid momentum surge pressure (water hammer).

The liquid momentum surge pressure should be added to the operating line pressure to determine the system's maximum line pressure. The maximum line pressure is used to select the proper pipe schedule or wall thickness.

The nomograph is based on the formula

$$P = \frac{0.070VL}{T}$$

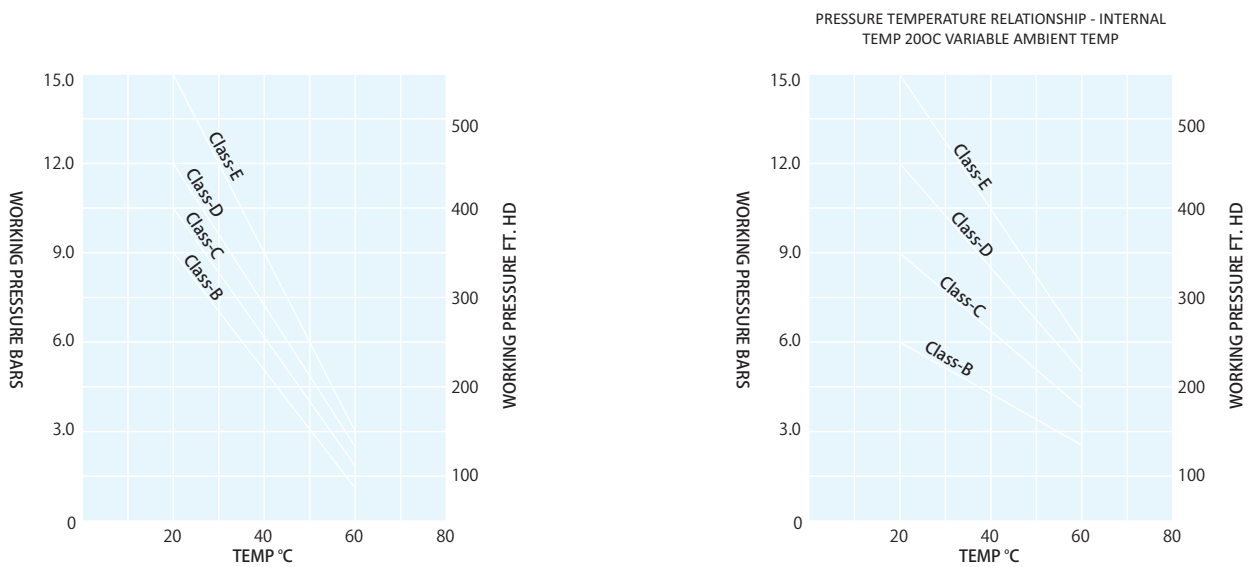
Where P is increase in pressure due to momentum surge in psi, L is inline length in feet, V is liquid velocity in feet per second, and T is valve closing time in seconds.





Pressure / Temperature Relationship:

The pressure / temperature relationship of PVC plays an important part in the behaviour of the pipe at elevated temperatures. In case where PVC Pipes are operating above ground, the ambient temperature will vary and although the temperature of the liquid being conveyed may not exceed 20°C, some reduction in strength, and therefore, of the maximum working pressure at which the pipe may be used will take place. In such cases, the working pressure of the pipe should be re-rated in accordance with graph-1 & Graph 2. If both the ambient temperature and the temperature of the liquid exceed 20°C, the reduction in working pressure is cumulative and the advice of the relevant



Combined External Load:

Combined external loads acting upon a buried pipe are expressed by:

- Where P = Combined external load, kg/cm²
 PE = Static earth load, kg/cm²
 Pt = Wheel load, kg/cm²

Relationship between burial depth and combined external loads is given below.

DEPTH		Earth Load	Wheel Load	Combined load
cm	ft	kg/cm ²	kg/cm ²	kg/cm ²
30	1	0.0493	1.226	1.2753
60	2	0.0905	0.546	0.6365
90	3	0.1248	0.313	0.3478
120	4	0.1533	0.204	0.3573
150	5	0.1771	0.144	0.3211
180	6	0.1969	0.107	0.3039
210	7	0.2135	0.083	0.2965
240	8	0.2272	0.066	0.2932



Earth Load

The load of backfill acting upon a buried pipe is calculated from the empirical formula of Master and Anderson.

$$PE = Cd, VB - 2k \tan \theta \frac{H}{B}$$

$$CD = 1 - e^{-K \frac{H}{B}}$$

$$K = \frac{1 - \sin \theta}{1 + \sin \theta}$$

Where PE = static earth load, kg/cm²
V = specific weight of backfill. In kg/cm³
(H = depth of cover, in cm
θ = angle of repose of soil, in deg.
B = width of trench, in cm.



Wheel Load

Kogler formula is used to calculate the wheel load when live loads such as those of trucks act upon a buried pipe:

$$Pt = \frac{2w_1 (1 + I)}{(a + 2H)(c + b + 2H)}$$

where

Pt = Wheel load, in kg/cm²
I = impact coefficient (normally 0.3)
Wt = load per wheel, in kg.
a = length of wheel in contact with ground, in cm
b = width of wheel in contact with ground, in cm.
C = distance between wheels of two parallel trucks in cm.
H = depth of cover, in cm.



نوټ: در وقت خرید اجناس کوثر به نشان تجارتي توجه نمائيد



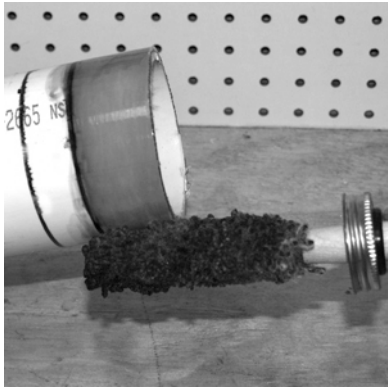
INSTALLATION / JOINTING PROCEDURE

Coat Surface with Primer

- Apply primer to the fitting sock - et aggressively working ti rito the surface.



- Apply primer to the pipe surface to appoint $\frac{3}{4}$ beyond the hub depth. Aggres - sively work the primer into the surface.



- Apply a second coat of primer to the fitting sock - et aggressively working ti rito the surface.

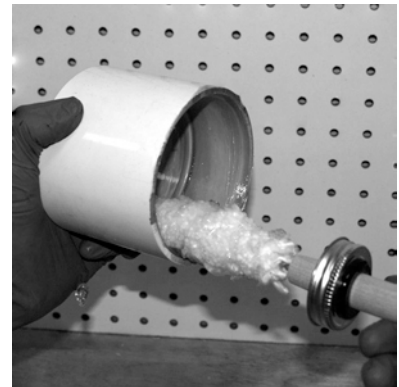


Coat Surface with Cement

- Apply a full even layer of cement to the pipe sur - face to a point $\frac{1}{2}$ " beyond the hub depth. Aggres - sively work the cement into the surface.



- Without re-dip - ping the applica - tor in the cement, apply a medium layer of cement to the fitting sock - et aggressively working it into the surface On bell end pipe do not coat beyond the socket depth.



- Apply a second full coat of ce - ment to the pipe surface aggres - sively working it in.



- More applications of primer may be required on hard surfaces or cold weather conditions.

- Once the surface is primed remove all puddles of excess primer from the fitting socket.

- Cement must be applied while primer is wet.

- Stir or shake the cement prior to use.

- Do not allow cement to puddle or accumulate inside the system.

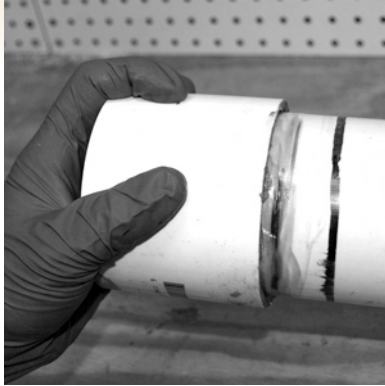
- Solvent cement should conform to the appropriate ASTM standard for the piping system as shown in the accompanying table. All purpose cement is not recommended



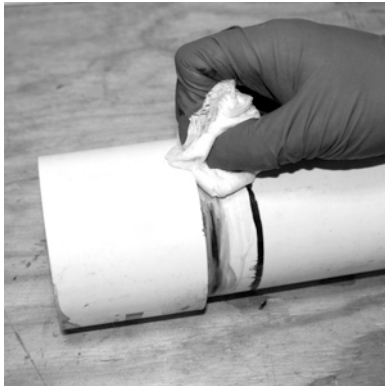


Join Pipe and Fittings

- Assemble pipe and fittings quickly while cement is fluid. If cement has hardened, cut pipe, dispose of fitting and start over.
- Insert pipe into the fitting hub giving a quarter turn as the pipe is being inserted, ensuring an even distribution of the cement within the joint. Do not quarter turn the pipe after contact with socket bottom.
- Once the pipe contacts the socket bottom hold pipe and fitting together until the pipe does not back out.
- See table for recommended set and cure times.



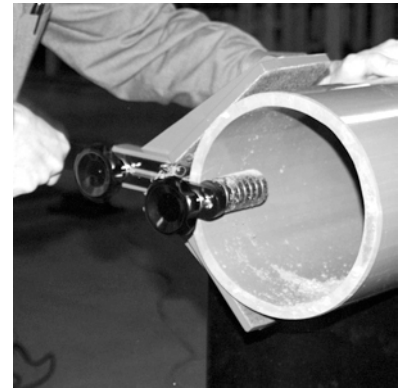
- Remove excess-cement from the exterior. A properly made joint will show a continuous bead of cement around the perimeter. If voids appear sufficient cement may not have been applied and joint failure may result.



- Acceptable tools include reciprocating saw, mechanical cut off saw with carbide tipped blade or other appropriate tool.
- If any indication of damage or cracking is evident at the (tube / pipe) end, cut off at least 2" of pipe beyond any visible cracks.

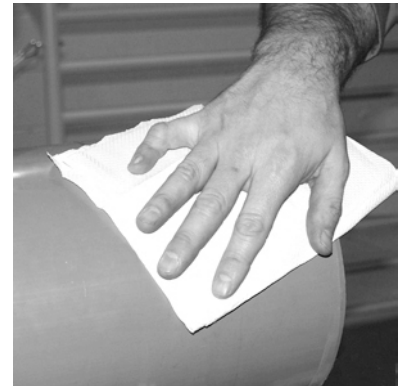
2. Remove Burrs and Bevel

- Remove all pipe burrs from inside and outside diameter of pipe with a de-burring tool.
- Chamfer (bevel) the end of the pipe 10° - 15°. Powered and manual chamfering tools are available.



3. Clean and Dry Pipe and Fittings

- Remove surface dirt, grease or moisture with a clean dry cloth.



6" and Larger PVC Pipe Fitting Systems

1. Cut Pipe

- Cut pipe square with the axis. All joints are sealed at the base of the fitting hub. An angled cut may result in joint failure.



4. Mark Insertion Depth

- Measure the fitting hub depth. Using a pipe wrap as a straight edge mark the insertion depth plus 2" in a heavy continuous line around the circumference of the pipe.

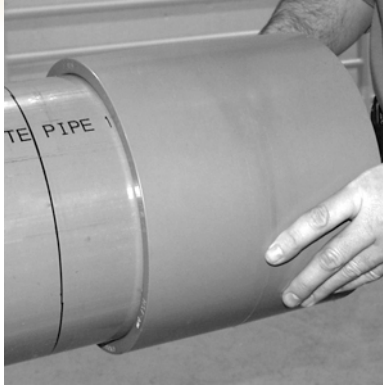


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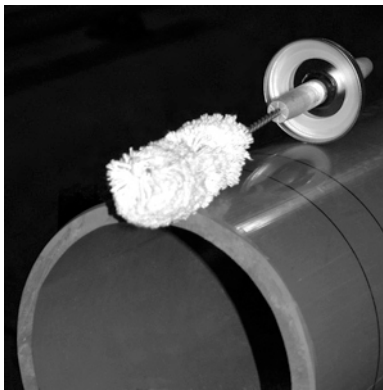
5. Dry Fit

- With light pressure, pipe should go one half to one third of the way into the fitting hub. Pipe and fittings that are too tight or too loose should not be used.



6. Applicator

- Use an applicator that is one half the size of the pipe's diameter. Use of an appropriately sized applicator will ensure that adequate cement is applied. Natural bristle brushes or swabs are recommended. Rollers are not recommended.
- Too small an applicator will not apply sufficient cement.



7. Crew Size

- Working rapidly, especially in adverse weather conditions, will improve installations. For 6" to 8" diameters a crew size of 2 to mechanics is required. For 10" pipe diameters and larger a crew of 4 mechanics may be required.

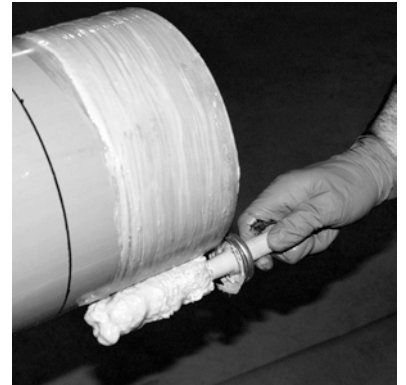
8. Coat Surface with Primer

- Apply primer to the fitting socket aggressively working it into the surface.



9. Coat Surface with Cement

- Cement must be applied while primer is wet. It is ideal if one mechanic applies the primer while a second immediately applies the cement.
- Stir or shake the cement prior to use.
- Apply a full even layer of cement to the pipe surface to a point $\frac{1}{2}$ " beyond the hub depth. Aggressively work the cement into the surface.

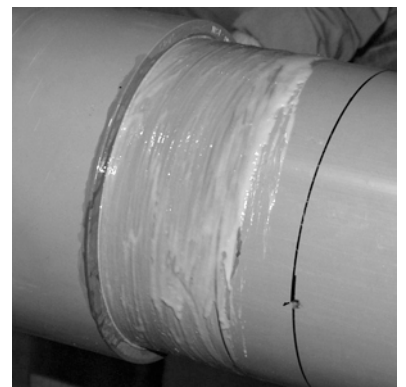


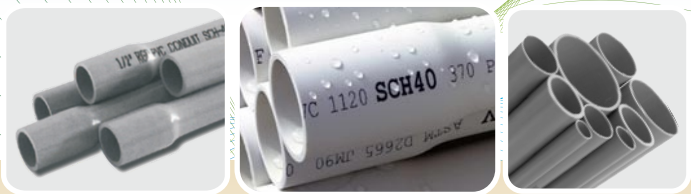
- Apply a medium layer of cement to the fitting socket aggressively working it into the surface. On bell end pipe do not coat beyond the socket depth.



10. Join Pipe and Fittings

- Assemble pipe and fittings quickly while cement is fluid. If cement has hardened, cut pipe, dispose of fitting and start over.
- It is very important that the pipe is fully inserted to the fitting stop at the bottom of the fitting. Large diameter pipe is heavy and can develop significant resistance during insertion. The use of a pulling tool designed for plastic piping systems is recommended.





CHEMICAL RESISTANCE OF KAWSAR uPVC & PVC PIPES:

PVC Pipes are highly resistant to salt water acids and alkalies. It is not recommended for use with organic ester, ketones, chlorinated solvents aromatic hydrocarbon and low molecular weight alcohols.

Resistance of uPVC & PVC Pipes to common chemicals under the conditions.

Mineral Acids	Hydrochloric Acid 30%	+
	Sulphuric Acid 50%	+
	Sulphuric Acid 98%	+
Alkalies	Ammonium Hydroxide	+
	Calcium Hydroxide	+
	Sodium Hydroxide	+
Salts	Calcium Chloride	+
	Potassium Chloride	+
	Sodium Bicarbonate	+
	Sodium Chloride	+
	Sodium Phosphate	+
	Sodium Sulphate	+
Oxidizing Agents / Disinfectants	Sodium Hydrochloride (Bleach Solution)	+
	Chlorine Water	+
	Calcium Hypochlorite - Soln. 18%	+
Organic Acids	Acetic Acid - 10%	+
	Citric Acid 25	+
	Hydroxy Acetic Acid	+
Oil & derived Products	Diesel Fuel	+
	Gasoline	+
	Lubricating & Thread Cutting Oils	+
	Motor Oil	+
Solvents	Acetone	-
	Methyl Ketone	-
	Toluene	-
	Trichloroethylene	-
	Turpentine	+
	Xylene	-
	Soaps & Detergents	+
Gases	Ammonia	+
	Carbon Dioxide	+
	Natural Gas	+
	Oxygen	+

(+) Denotes Resistant (-) Not Resistant



CONVERSION TABLE

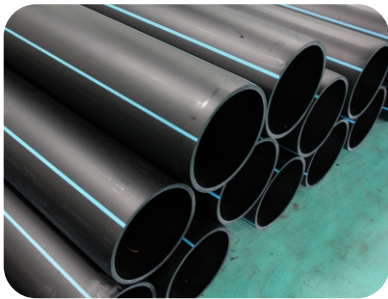
Quantity	SI Unit	Alternate SI Unit	Conversion Factor		U.S. Unit	Conversion Factor	
			K	1/K		K	1/K
Length	M		1	1	In (inch)	39.370	2.54x10 ⁻²
					ft (foot)	3.281	0.305
					mi (mile)	6.214x10 ⁻⁴	1609.344
area	m ²	Hectare	104	104	in ²	1550	6.452x10 ⁻⁴
					ft ²	10.764	0.093
					mi ²	3.861x10 ⁻⁷	2.59x10 ⁶
Volume	m ³	dm ³ =l	1000	0.001	ft ³	35.315	0.0283
					gal (gallon)	264.172	3.785x10 ⁻³
Mass	kg	ton	1000	0.001	gal (gallon) UK	219.969	4.546x10 ⁻³
					lbm (pound)	2.205	0.454
					gr (grain)	15432.4	6.479x10 ⁻⁵
Force	N	kgf	0.102	9.807	oz (ounce)	35.274	2.835x10 ⁻²
					dyne	105	10 ⁻⁵
					lbf	0.225	4.448
Pressure	N/mm ² =MPa	Kgf/mm ²	0.102	9.807	psi (lbf/in ²)	145	6.895x10 ⁻³
					bar	10	0.1
					mmHg=torr(0o)	7500.62	1.333x10 ⁻⁴
Energy	J	kgf-m	0.102	9.807	dyn/cm ²	107	10 ⁻⁷
					erg	107	10 ⁻⁷
					lbf-ft	0.738	1.356
Power	W	kcal/hr	0.860	1.162	cal	0.239	4.184
					BTU	9.478x10 ⁻⁴	1055.06
					oR (Rankine)	3.415	0.293
Temperature (absolute) (difference)	K					1.8	0.555
						K, 0C	1.8
Viscosity (dynamic)	Pas=N s/m ²	kfg s/m ²	0.102	9.807	lbf s/ft ²	0.0209	47.880
						cp	1000
Density	m ³ /S				lb/ft ³	0.0624	16.018
Thermal Conductivity	Kg/m ³	g/cm ³	0.001	1000	BTU in/ft ² hr oF	6.933	0.144
						W/mk	0.860
Specific Entropy	k/kg K	kcal/kg oC	2.390x10 ⁻¹	4.184	BTU / lbfm oR	2.388x10 ⁻¹	4.187

نوٹ: در وقت خرید اجناس کوثر به نشان تجارتی توجه نمائید



OTHER PRODUCTS

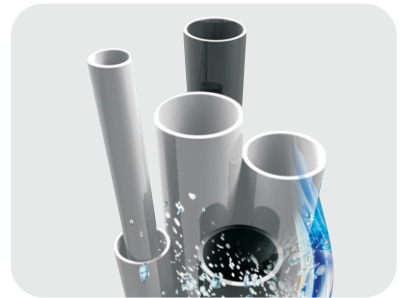
HDPE WATER PIPES



PPR-C PIPES



PVC PIPES



MDPE GAS PIPES



PPR-C FITTINGS



PVC CONDUIT PIPES



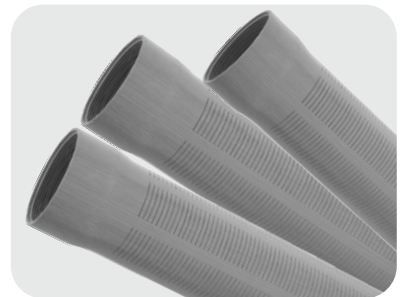
HDPE CONDUIT PIPE



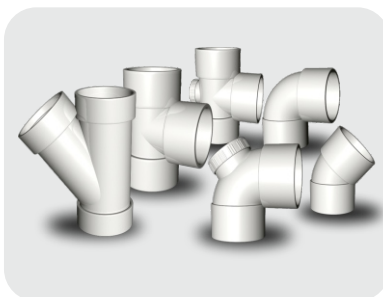
PVC, CPVC SOLVENT CEMENT



PVC SCREEN / SLOTTED PIPES



PVC FITTINGS



KAWSAR



کوثر

**Pipe Manufacturing Company
Kabul
Kawsar Engineering Peshawar**

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شرکت انجنیری کوثر پشاور

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