



KUWAIT

شركة الخرافي لصناعات البلاستيك  
KHORAFI PLASTIC INDUSTRIES COMPANY



UPVC / PVC PIPES + FITTINGS & ACCESSORIES



# شركة الخرافي لصناعات البلاستيك KHORAFI PLASTIC INDUSTRIES COMPANY

## PROFILE

KHORAFI PLASTIC INDUSTRIES COMPANY WAS ESTABLISHED IN 1975 IN EAST AHMADI INDUSTRIAL AREA. IT IS IN BLOCK 6, AREA 35, 36 AND 37 AND COVERS A TOTAL AREA OF ABOUT 3000 SQUARE METERS. KHORAFI PLASTIC INDUSTRIES CO. HAS BECOME ONE OF THE NOTED MANUFACTURERS AND SUPPLIERS OF UNPLASTICISED POLYVINYL CHLORIDE (uPVC) PIPES AND FITTINGS IN KUWAIT MARKET.

AT THE PEAK TIME OF ITS BUSINESS IN 1990 UNFORTUNATELY IT WAS COMPLETELY DESTROYED AND ALL ITS MACHINERY WAS TAKEN AWAY AND STRUCTURE WAS RAZED TO THE GROUND DUE TO INVASION.

AFTER THE LIBERATION WE STARTED AS A SMALL UNIT BUT AFTER ABOUT 25 YEARS OF TOTAL EFFORTS AND SPIRITED DETERMINATION ONCE AGAIN WE ARE A FULLFLEDGED MANUFACTURING INDUSTRY SUPPLYING TO THE OIL INDUSTRY, MINISTRY OF PUBLIC AUTHORITY, COMMUNICATION, MINISTRY OF ELECTRICITY & WATER, GENERAL CONSTRUCTION PROJECTS, ROAD PROJECTS, HOUSING PROJECTS ETC...

THE COMPANY BELONGS TO THE KHORAFI FAMILY AND HEADED BY MR. ABDULLA BADER AL KHORAFI AND MR. YOUSEF BADER AL KHORAFI ALONG WITH FAMILY PARTNERS.

AT PRESENT IT HAS ABOUT 100 EMPLOYEES, MORE THAN 50 MACHINES. IT OWNS A DELIVERY FLEET OF ABOUT 30 VEHICLES INCLUDING HALF LORRIES, TRUCKS AND MINI BUSES. IT MAINLY SUPPLIES TO THE DOMESTIC MARKET AND GENERAL CONTRACTORS. CURRENTLY ABOUT 300 PLUS SHOPS DISTRIBUTE OUR PRODUCTS ALL OVER KUWAIT.

ALONG WITH MANUFACTURING WE ALSO IMPORT UPVC, CPVC, PPR PIPES AND FITTINGS, GALVANIZED PIPES AND FITTINGS, ADHESIVES AND ACCESSORIES AND LATEST SANITARY FITTINGS TO DISTRIBUTE THEM IN THE KUWAITI MARKET. OUR PRODUCTS ARE WELL ACCEPTED AND APPROVED BY MANY MAJOR COMPANIES IN KUWAIT.

WE CONSIDER OUR CUSTOMERS AS VALUABLE ASSETS, PARTNERS IN PROGRESS AND KEEP GOOD RELATIONSHIP WITH THEM. WE DELIVER GOODS TO THE DESTINATIONS WITH ALL POSSIBLE CARE AND BEST OF SERVICES TO THE SATISFACTION OF ONE AND ALL.



*Best Quality  
and  
Super Service Is Our Motto*

## GENERAL INFORMATION

Khorafi Plastic Industries Company's UPVC / PVC (Unplasticised Polyvinyl Chloride) Pipes are manufactured using Extrusion Process. Fittings are manufactured using Injection Moulding Machines. UPVC / PVC Pipes for Potable water correspond to DIN 19532, DIN 19534, DIN 8061 DIN 8062 DIN 8063 and also incorporated with ISO Standards.

### Usage of UPVC / PVC Pipes and Fittings

UPVC / PVC Pipes and fittings are used for all portable water piping requirements in residential, hotels, homes, site offices, commercial and institutional structures, irrigation water supply, fire fighting water supply systems.

UPVC / PVC Pressure Piping system is used extensively underground and inside building, below and aboveground installation, drinking water installation and irrigation water system, cable duct system and telephone cable subducts system and electrical system.

UPVC / PVC Sewerage and Drainage system is used for installation of discharge system inside building, home and industries, soil and ventilation, waste and sewerage system, below and above ground drainage and sewerage system gravity sewerage system, rain water discharge, disposal fields for septic tank drains and leaching systems subsoil drains for lowland and surface water drainage, and sewage service.

UPVC / PVC Cable Ducts and accessories meet all requirements of local Governmental bodies like MOC, NHA & MEW. Cable ducts pipes and fittings are used for installation of cable duct system, telephone cable subducts system and electrical systems.

### Advantages of UPVC / PVC Pipes

- ▶ Smooth flow, Long durability, Realibility
- ▶ Non corrosive, Non abrasive, Non conductor.
- ▶ Insensitive to aggressive media and soil
- ▶ Easy to install, Less weight and average cost
- ▶ No insulation or protective coating needed
- ▶ No rust, no bad odour, higher flow, minimum maintenance
- ▶ No fungus growth, non reactive to most chemicals
- ▶ Resistance to flame, insects or rodents

### Khorafi Plastic Industries Company produces the folowing products Categories :

- ▶ Khorafi Plastic UPVC / PVC Conduit Pipes & Accessories.....
- ▶ Khorafi Plastic UPVC / PVC Cable Ducts & Accessories.....
- ▶ Khorafi Plastic UPVC / PVC Sewerage & Drainage Pipes and Fittings .....
- ▶ Khorafi Plastic UPVC / PVC Pressure Water Pipes and Fittings.....

# Khorafi Plastic Industries Company

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 Tel : 23984537 / 23981415 / 23981419 Fax : 23984538  
 E-mail : khorafiplastic@gmail.com Website : khorafiplastic.com



KUWAIT

## GENERAL MANUFACTURING STANDARDS FOR UPVC PIPES

**PIPE DIMENSIONS AS PER DIN 8061 / 8062 DIN 19531, 19534, BS 5481, BS 4514, BS 5255, BS 4660  
 PRESSURE PIPE FOR COLD WATER, BELOWGROUND, DRAINAGE & SEWAGE SYSTEM AND CABLE DUCT**

CLASS	CLASS 1		CLASS 2		CLASS 3		CLASS 4		CLASS 5		CABLE DUCT PIPES		
	PN 2 BAR		PN 4 BAR		PN 6 BAR		PN 10 BAR		PN 16 BAR		WALL THICKNESS	NOMINAL WEIGHT	NOMINAL WEIGHT
NOMINAL PRESSURE IN BARS	WALL THICKNESS	NOMINAL WEIGHT	WALL THICKNESS	NOMINAL WEIGHT	WALL THICKNESS	NOMINAL WEIGHT	WALL THICKNESS	NOMINAL WEIGHT	WALL THICKNESS	NOMINAL WEIGHT			
NOMINAL O.D	MM	Kg / M	MM	Kg / M	MM	Kg / M	MM	Kg / M	MM	Kg / M	MM	MM	Kg / M
20	20.2								1.5	0.137			
25	25.2						1.5	0.174	1.9	0.212			
32	32.2						1.8	0.264	2.4	0.342			
40	40.2				1.8	0.334	1.9	0.350	3.0	0.525	2.3	0.417	
50	50.2				1.8	0.422	2.4	0.552	3.7	0.809	3.0	0.690	
63	63.2				1.9	0.562	3.0	0.854	4.7	1.290			
75	75.3		1.8	0.642	2.2	0.782	3.6	1.220			2.6	0.924	
110	110.3	1.8	2.2	1.160	4.5	2.370					3.2	1.640	
160	160.4	2.5	3.2	2.410	4.7	3.440					3.6	2.650	
160	160.4										5.0	3.659	
200	200.4		4.9	4.679							4.5	4.120	

Standard Length : 20mm, 25mm, 32mm, 40mm -- 4 / 6 meters and 50mm to 200mm -- 6meters long.  
 Colour : 20mm to 75mm Grey colour, 110mm to 200mm Grey and Orange Colour.  
 Socket : 20m to 40mm Plain end Pipe and 50mm to 200mm Solvent weld socket.



## CHEMICAL RESISTANCE CHART OF UPVC SYSTEM

○ : Unaffected    ○ : Unaffected to little affected    Δ : Little affected but recommendable    x : Not recommendable

Chemicals	Concentration %	Temperature ° C		
		20	40	60
Inorganic Acids				
Sulfurous acid	100	○		×
Hydrochloric acid	Below 30	●	●	○
	Above 30	●	○	○
Chloric acid	Below 30	○	●	○
Chlorine water	sat.	○	△	
Perchloric acid	Below 10	●	●	○
	20	●		△
Mixed chromic acid			●	
CrO <sub>3</sub> (25) : H <sub>2</sub> SO <sub>4</sub> (20) : aq. (55)		○	○	○
CrO <sub>3</sub> (40) : H <sub>2</sub> SO <sub>4</sub> (20) : aq. (40)		●	●	○
Chromic acid	10	●	○	△
	50	○	○	×
Chlorosulfonic acid	100	●	●	○
Hydrofluosilicic acid	34	●	●	△
Mixed acid				
H <sub>2</sub> SO <sub>4</sub> (57):HNO <sub>3</sub> (28) : aq. (15)		●	○	
H <sub>2</sub> SO <sub>4</sub> (15):HNO <sub>3</sub> (20) : aq. (65)		●	●	○
H <sub>2</sub> SO <sub>4</sub> (50):HNO <sub>3</sub> (33) : aq. (17)		○	○	
H <sub>2</sub> SO <sub>4</sub> (48):HNO <sub>3</sub> (49) : aq. (3)		●	○	
H <sub>2</sub> SO <sub>4</sub> (50):HNO <sub>3</sub> (50) : aq. (0)		●	×	
H <sub>2</sub> SO <sub>4</sub> (10):HNO <sub>3</sub> (20) : aq. (70)		●	●	
H <sub>2</sub> SO <sub>4</sub> (11):HNO <sub>3</sub> (87) : aq. (2)		○		
Hydrobromic acid	40	●	●	○
Bromine	100	×		
Bromine acid	10			
Nitric acid	Below 50	●	●	○
	50-60	●	○	
	70	△	△	
	96	×		
Blue acid	100	●		
Carbonic acid	100	○		●
Fuming sulfuric acid	10	×		
Arsenic acid	Below 30	○	●	○
	75	○		×
Hydrofluoric acid	10	○		
	20	●	○	○
	40	○		×
Boric acid	sat.	●	●	○
Sulfuric acid anhydride	100			
Sulfuric acid	Below 90	●	●	○
	96	●	●	△
	98	○	△	
Phosphoric acid	Below 30	○	○	○
	Above 30	●	○	○
Organic Acids				
Adipic acid	sat.	●	●	○
Benzoic acid	sat.	●	●	△
Oleic acid	100	●	●	○
Formic acid	Below 50	○	○	△
	Above 50	●		×
Citric acid	25	●	●	×
Succinic acid	sat.	○	○	○
Acetic acid	Below 60	○	○	○
	85-95	●	○	
	Above 95	○	×	×
Mercury	100	●	●	●
Ammonium carbonate	sat.	○	○	○
Potassium carbonate	sat.	○	○	○
Potassium ferrocyanide	sat.	○	○	○
Ammonium fluoride	sat.	○		
Potassium iodide	sat.	○	○	○
Sodium sulfide	sat.	○	○	○
Zinc sulfate	28	○	○	○
Aluminium sulfate	25	○	○	○
Aluminium potassium sulfate (alum)	sat.	○	○	○

Chemicals	Concentration %	Temperature ° C		
		20	40	60
Ammonium sulfate	40	○	○	○
Ferrous sulfate	sat.	○	○	○
Ferric sulfate	sat.	○	○	○
Coppersulfate	15	○	○	○
Sodium sulfate	sat.	○	○	○
Nickel sulfate	sat.	○	○	○
Magnesium sulfate	sat.	○	○	○
Ammonium phosphate	sat.	○	○	○
Sodium phosphate	sat.	○	○	○
<b>Organic Solvent and Other Organics</b>				
Acetaldehyde	100	x	○	○
Acetone	100	x	○	○
Aniline	100	x	○	○
Amyl alcohol	100	○	○	Δ
Ayl alcohol	100	○	○	x
Isopropyl alcohol	100	○	○	○
Ethyl alcohol	100	○	○	○
Ethyl ether	100	x	○	○
Ethyl hexanol	100	○	○	○
Ethyl benzene	100	x	○	○
Ethylene glycol	100	○	○	○
Ethylene chloride	100	x	○	○
Methylene chloride	100	x	○	○
Octane	100	○	○	○
Octanol	100	○	○	○
Xylene	100	x	○	○
Glycerine	100	○	○	○
Cresol	sat.	Δ	○	○
Chlorobenzene	100	x	○	○
Chloroform	100	x	○	○
Amyl acetate	100	x	○	○
Ammonium acetate	sat.	○	○	○
Ethyl acetate	100	x	○	○
Butyl acetate	100	x	○	○
Carbon tetrachloride	100	x	○	○
Diethyl phthalate (DOP)	100	x	○	○
Cyclohexanone	100	x	○	○
Cyclohexanol	100	○	○	Δ
Dibutyl phthalate (DBP)	100	x	○	○
Dimethyl formamide	100	x	○	○
Tetrachloroethylene	100	x	○	○
Trichloroethylene	100	x	○	○
Toluene	100	x	○	○
Glacial acetic acid	100	Δ	x	x
Diglycolic acid	20	○	○	○
Oxalic acid	9	○	○	○
Tartaric acid	50	○	○	○
Lactic acid	50	○	○	○
	90	x	○	○
Picric acid	5	○	○	○
Phenol	sat.	Δ	○	x
Benzene sulfonic acid	10	○	○	○
	50	○	○	○
Malic acid	44	○	○	○
Methyl sulfuric acid	50	○	○	Δ
Butyric acid	20	○	○	○
	100	x	○	○
<b>Alkalies</b>				
Ammonia water	30	○	○	○
Potassium hydroxide	Below 40	○	○	○
	Above 40	○	○	○
Calcium hydroxide (slaked lime)	sat.	○	○	○
Sodium hydroxide	Below 40	○	○	○
(caustic soda)	40-60	○	○	○
Magnesium hydroxide	sat.	○	○	○

Chemicals	Concentration %	Temperature ° C		
		20	40	60
Inorganic Salts and other				
Inorganics				
Sodium sulfate	40	○	○	○
Zinc chloride	sat.	○	○	○
Aluminum chloride	25	○	○	△
Ammonium chloride	27	○	○	○
Potassium chloride	sat.	○	○	○
Calcium chloride	sat.	○	○	○
Mercuric chloride	sat.	○	○	○
Stannic chloride	25	○		△
Ferric chloride	sat.	○	○	○
Cupric chloride	sat.	○	○	○
Sodium chlorate	sat.	○	○	○
(common salt)				
Barium chloride	sat.	○	○	○
Magnesium chloride	25	○	○	○
Sodium chlorate	sat.	○	○	○
Potassium chlorate	15	○	○	○
Potassium perchlorate	1	○	○	
Hydrogen peroxide	20	○	○	○
	40	○	○	
Potassium permanganate	15	○	○	○
Potassium persulfate	sat.	○	○	○
Antimony trioxide	sat.	○	○	○
Potassium hypochlorite	30	○		
(bleaching powder)				
Potassium bichromate	5	○		
	10	○		
Potassium bisulfite	sat.	○	○	○
Potassium nitrate	sat.	○	○	○
Calcium nitrate	50	○	○	
Sodium nitrate	sat.	○	○	○
Nitro benzene	100	x		
Urea	sat.	○	○	○
Carbon bisulfide	100	x		
Pyridine	100	x		
Butane (liquid)	100	○		
Butanediol	Below 10	○		
	60	x		
Butyl alcohol	100	○	○	
Furfural	100	x		
Furfuryl alcohol	100	○		
Propane (liquid)	100	○		
Benzaldehyde	sat.	x		
Benzene	100	x		
Benzyl alcohol	100	○		
Formaldehyde	36	○	○	○
Methyl alcohol	100	○	○	○
Methyl ethyl ketone	100	x		
Gases				
Sulfur dioxide gas	100	○	○	○
Ammonia	100	○	○	○
Methyl chloride	100	x		
Chlorine dry	10	△	△	x
Chlorine wet	10	△	△	x
Ozone	1			
Hydrogen	100	○	○	○
Carbon dioxide	100	○	○	○
Propane	100	○		
Butane	100	○		
Phosgene	100	○		
Hydrogen sulfide	100	○	○	○
Roasting furnace gas	100	○	○	○

## MATERIAL SAFETY DATA SHEET

### SECTION - I

#### MANUFACTURER'S DETAILS :

COMPANY NAME	: KHORAFI PLASTIC INDUSTRIES COMPANY
ADDRESS	: POST BOX : 9948 - AHMADI - 61010 - KUWAIT
FACSIMILE NUMBER	: 00965 2398 4538
TELEPHONE NUMBER	: 00965 2398 4537

### SECTION - II

#### IDENTIFICATION :

PRODUCT NAME	: PVC -Polyvinyl Chloride / Unplasticized Polyvinyl Chloride - UPVC Unmodified Polyvinyl Chloride ( PVC, UPVC, uPVC, PVC-U ) Pipe, Conduit and Moulded Fittings.
TRADE NAME	: <b>BAK - KHORAFI PLASTICS</b>
DANGEROUS GOODS CLASS AND SUBSIDIARY RISK	: Not classified as hazardous according to criteria of worksafe.
HAZCHEM CODE	: No code allocated
POISONS SCHEDULE No.	: Not listed
USE	: Water supply, Irrigation, Sewerage, Drainage, Gas, Industrial Processing, Telecommunications and Electrical Conduit.

**PHYSICAL DESCRIPTION / PROPERTIES :**

APPEARANCE	: Opaque rigid solid tubes, diameters from 15 to 400mm, lengths upto 6mtr, various colours ( white, grey, blue, yellow, green, orange ) with or without jointing sockets, with or without ribbed / profiled exterior. Various fittings to match, eg. Tees, bends, reducers, couplings, elbows etc.
BOILING POINT / MELTING POINT	: Softening Point : >75 °C. Decomposition initiates at approximately 140°
VAPOUR PRESSURE	: Not applicable.
RELATIVE DENSITY	: 1.3 - 1.6
FLASHPOINT	: Not applicable.
FLAMMABILITY LIMITS	: Combustible, Self Extinguishing.
SOLUBILITY IN WATER	: Insoluble

**SECTION - III**

**INGREDIENTS :**

Chemical Name	CAS Number	Proportion
Polyvinyl Chloride Polymer	9002 - 85 - 2	80 - 82%
Fillers ( eg.Calcium Carbonate )	471 - 34 - 1	4 - 6%
Lubricants (eg. Polyethylene Wax & Stearates)	Not Applicable	1.5 - 1.7%
Modifiers (eg. Chlorinated, Polyethylene, Acrylics)	888311 - 2	4 - 6%
Stabilisers (eg. Stearates of Calcium & Butyletin)	Not Applicable	1.2 - 1.3%
Pigments ( eg. Titanium Dioxide )	13463 - 57 - 7	8 - 9%

## SECTION - IV

### HEALTH HAZARD INFORMATION :

<b>General</b>	: There are no significant health hazards associated with PVC pipe products under normal conditions of use or from mechanical working or forming the product. All additives are encapsulated within the polymer matrix and should present no hazard under conditions of normal use and good occupational work practice. For pipes intended for use with drinking water, effect on water quality is covered by requirements of Australian standards. Peripheral effects may arise from combustion or misuse. See section precautions for use. No listed carcinogenic mytagenic or teratogenic effects.
<b>Acute :</b>	
Swallowed	: There are no known health effects for the ingestion of PVC.
Eye and Skin	: Inapplicable to the solid except for mechanical injury. Dust from sawing may affect eyes if not protected. Hydrogen chloride and other fumes emitted during combustion cause irritation to the eyes and skin.
Inhaled	: Inapplicable to the solid product inhalation of combustion products, especially hydrogen chloride, causes irritation of the respiratory tract. Individuals with bronchial asthma and other chronic obstructive respiratory diseases may develop broncho-spasm if exposure is prolonged.
Chronic	: Inhalation of PVC dust created by mechanical working has been reported to cause fine nodules visible on chest X - rays. Contact with heavy concentrations of gaseous combustion by products may result in formation of permanent scar tissue.



#### FIRST AID :

Swallowed	: No harmful effect. No LD 50 data is available for product.
Eye and Skin	: No special treatment. Treat mechanical injury and duct contact normal procedures. Gaseous combustion by - products : irrigate with fresh water seek medical assistance if effect persists. If molten material contacts skin and adheres, cool quickly with running water, do not attempt to remove. Seek medical advice.
Inhaled	: Gaseous combustion byproducts: Remove from source of exposure. Seek medical advice.
First Aid Facilities	: No special requirements.
Advice to Doctor	: Treat symptomatically.

#### SAFE HANDLING INFORMATION :

Storage and transport	: No special requirements. PVC Pipe products are not considered hazardous for transportation according to Transport of Goods by Road and Rail Acts.
Handling	: Injury can be sustained by rolling of pipe. Unpack crates and bundles on a flat surface, and ensure free stacks are adequately chocked. Do not climb on stacks.
Material Working	: Normal safe practices should be employed when working with the material: work in a well ventilated area and use dust masks and eye protection when cutting. When heating for bending or other forming, use hot water or air with appropriate safeguards. Use of an open flame is inadvisable.
Spill and Disposal	: Spillage - not applicable. Disposal - recycle where possible. Refer to appropriate environmental protection agency / authority. Normally suitable for disposal as general waste land fill.
Fire / Explosion Hazard	: Combustible, self - extinguishing. No explosion risk. If forced to burn, it will emit dense acid fumes containing noxious and toxic compounds including carbon monoxide, carbon dioxide and hydrogen chloride. Carbon dioxide is an asphyxiant. Carbon monoxide is toxic. Hydrogen chloride is highly acidic and severe irritant in low concentrations with sustained exposure. Hydrogen chloride has a highly detectable pungent odour, and is intolerable in very low concentrations. The risk of exposure to hazardous levels for sustained periods is therefore considered low.

Firefighting Procedures	: Wear fully protective body suit with self - contained breathing apparatus (SCBA) to prevent contact with gases produced during combustion.
Fire Extinguishing Media	: Use water, water fog or foam to extinguish fires. Carbon Dioxide or dry chemical are suitable, but are not preferred, as lack of cooling capacity may result in the re-ignition of combustion supporting materials.
First Aid Facility	: No special requirements
Advice to Doctor	: Treat symptomatically.

## SECTION - V

### PRECAUTIONS FOR USE :

Exposure Standards	: No value assigned by National Health and Medical Research Council. A limit of 10mg / m <sup>3</sup> for nuisance dusts is recommended.
Engineering Standards	: Stability - Stable Incompatibility - none.
Personal Protection	: No special protection required. Gloves are advisable when handling cut ends of pipes. May shatter if impacted under stress, particularly when cold. When working with the product, normal safety glasses are recommended, and dust mask if sawing with abrasive wheel or sanding.
Flammability	: Combustible, selfextinguishing.

This MSDS summarises our best knowledge of the health and safety hazard information of the product and in particular how to safely handle and use the product in the workplace. Khorafi Plastic Industries Company cannot anticipate or control all the conditions under which the product may be used, and it remains the responsibility of each user, prior to usage, to review this MSDS in the context of how the user intends to handle and use the product in the workplace.

## TECHNICAL DATA OF PVC / U-PVC PIPES AND FITTINGS

**MATERIAL** : Unplasticised Polyvinylchloride

**STANDARD LENGTH** : Available in the length of 6 Meters and 3 Meters as per customer's request. Pipes are with or without socket. Sockets are either solvent cement welding type or rubber ring jointing type.

**COLOUR** : Black, Grey, White, Orange.

### STANDARDS :

- UPVC Electrical Conduits and fittings Manufactured as per British Standards 4607, BSEN 50086 & BS 6099/2
- UPVC Pressure Pipes and Fittings Manufactured as per German Standards DIN 8061, 8062 and 8063
- UPVC Pipes and Fittings for Sewage & Drainage System Manufactured as per DIN Standards 19531-19534
- UPVC Pipes and fittings for Soil and Ventilating, Waste Water, Below Ground Drainage & Sewage, Gravity Sewerage as per BS 4514, BS 5255, BS 5481, BS 4660.

## PHYSICAL, ELECTRICAL, MECHANICAL AND THERMAL PROPERTIES OF PIPE MATERIALS :

### 1. PHYSICAL PROPERTIES :

GENERAL SPECIFICATION	uPVC	UNITS
Specific Gravity	1.4 - 1.45	GR./CM <sup>3</sup>
Specific Heat (Max)	0.25	KCAL. / KG. / °C
Thermal Conductivity	0.13	KCAL CM H °C
Co-Efficient of Linear Expansion	$5 \times 10^{-5}/^{\circ}\text{C}$	/ °C
Vicat Softening Temperature	85 °C	AT 1 Kg. Load
Vicat Softening Temperature	79 °C	AT 5 Kg. Load
Tensile Strength @ 20 °C (Min)	500	Kg / CM <sup>2</sup>
Modulus of Elasticity	1200 - 1500	MPA.
Water Absorption	<4	MG / CM <sup>2</sup>
Hardness - Shore D	80 - 90	
Flammability	Self Extinguishing	

### 2. ELECTRICAL PROPERTIES :

Dielectric strength at 27 °C : 1600 Volts / mm

Insulation Resistance : 1382 Mega Ohm / Km

### 3. MECHANICAL PROPERTIES :

Tensile Strength at $23 \pm 2^\circ\text{C}$	: 500 - 550 Kg / cm <sup>2</sup>
Modules plasticity st $23 \pm 2^\circ\text{C}$	: 30000 Kg / cm <sup>2</sup>
Impact Strength ( pendulum )	: Complies with DIN 8061
Compressive Strength at $23 \pm 2^\circ\text{C}$	: 580 - 700 Kg / cm <sup>2</sup>
Flexural Strength at $23 \pm 2^\circ\text{C}$	: 850 - 980 Kg / cm <sup>2</sup>

### 4. THERMAL PROPERTIES :

Vicat Softening Temperature	: 85 - 91°C
Heat reversion	: < 5% ( DIN 8061 )
Co-efficient of linear expansion	: $0.8 \cdot 10^{-4}$

### TECHNICAL INFORMATION :

#### Installation Instructions for U-PVC Pressure Piping System :

One of the most important features of U-PVC Pipes is the ease with which they can be installed. This fact plus the wide range of available pipe components, make possible fast and economical installation, maintenance and modification of the piping systems. It is the objective of this section to provide instructions on the techniques of joining and handling to allow the maximum integrity of the piping system.

#### 1 Handling of U-PVC Pipes & Fittings :

- a) Care should be exercised to avoid rough handling of UPVC pipe and fittings. They should not be dragged over sharp objects or projections, dropped or have objects dropped upon them.
- b) Transportation by truck will require that the pipe will be continuously supported along its length and all sharp edges on the truck bed that could come in contact with the pipe must be padded.

#### 2 Storing Pipes and Fittings :

- a) If possible, pipes and fittings should be stored under shade, if this is not possible, the pipe should be stored on levelled ground which is free of any sharp objects. If different thickness classes are stacked together, the thickest pipe should be on bottom.
- b) The pipe should be protected from the sun and put in an area with good ventilation. This will lessen the effect of ultraviolet rays, will prevent discolouring and help prevent heat build up.
- c) If the pipe is stored in racks, it should be continuously supported along its length.
- d) Fittings must be stored in their original cartons to keep them free of dust and reduce the possibility of damage and must be stored inside.

#### 3 Expansion of UPVC Pipes :

UPVC Pipes like any other piping materials undergo length changes as a result of temperature variations above and below the installation temperature. They expand and contract 4.5 times more than steel pipes. The change of dimensions depends on the co-efficient of linear expansion, the length of pipe and the temperature variations. The movement or growth in pipe length can be significant, stresses generated by variation between installation and operation is rather big. However, the resultant stresses generated by movement will be somewhat less for plastics than for steel. This is due to the higher modules of elasticity for UPVC pipes in comparison to metallics and over time some stress relaxation will occur.



#### 4 Installation Guidelines with Respect to Length Changes :

1. The length changes in pipelines section should be controlled by proper arrangement of fixed clamps. It is possible to distribute the length changes in pipeline sections by suitable positioning of fixed points .
2. If it is not possible to include a flexible section at a change of direction or a branch, or if extensive length changes must be taken up in straight sections of pipelines, expansion loops have to be installed.
3. Valves should be mounted as direct as possible i.e they should be formed as fixed points. The actuating force is thus transmitted directly and not through the pipeline. The length changes, starting from the valve, are to be controlled.
4. Where pipeline is installed under plaster or embedded in concrete changes direction or branches off, the flexible sections under consideration must be padded along the length 'a' which is based on the calculated length change. The accompanying tees or Elbows must of course, also be included in the padding.
5. U-PVC pipelines need to be supported at specific intervals, depending on the material, the temperature of the fluid being transported and its density, the diameter and wall thickness of the pipe.
  - Arrangement of loose clamps : Axial movement of the pipeline must not be impeded by fittings positioned next to the pipe brackets.Sliding or hanger type brackets permit movement of the pipelines in different directions. A sliding block attached to the base of the pipe brackets, allows movement as required. When the pipeline changes direction, sliding brackets are necessary at given points in order to maintain free movement of the pipe.
  - If the pipe clamp is positioned directly beside a fitting, the length change of the pipeline is limited to one direction only.In the case of U-PVC pipeline it is also possible to direct movement of the pipe to one or both sides by cementing limiting rings next to the pipe clamp. The limiting rings are made from a PN10 pipe with the same outside diameter. Cut approximately one third of the circumference out of a 2 - 3cm piece of piping. Then deburr all the edges.

#### INSTALLATION PROCEDURES :

##### I. SOLVENT CEMENTING UPVC PIPE AND FITTINGS :

Solvent cementing is a preferred method of joining rigid UPVC pipes and fittings, providing a chemically fused joint. Solvent cementing procedures are simple if each step is handled with reasonable care. Experience shows that most field failures are due to improperly made solvent cemented joints.

##### Preparations :

1. Make sure the solvent cement you use is designed for the specific application you are attempting, for example is the system for under pressure ? Is the pipe UPVC ?
2. Make sure that only skilled technician may proceed with cementing.
3. Prepare the tools required for the procedure : i.e.
  - Cutting device ( saw or pipe cutter )
  - Deburring tool ( Knife, file or levelling machine )
  - Cleaner and primer ( Wherever applicable )
  - The suitable type i.e UPVC for UPVC components.
  - If solvent cement is not supplied with a brush the proper size of a brush must be ready for use.

##### Procedure for solvent cementing :

1. The pipe must be cut off at right angles, deburr inside and chamfer outside edges.
2. The pipe end and fittings must be cleaned from any obvious dirt by a dry and clean rag.
  - The outside of the pipe and inside of the socket of the fitting must be cleaned with PVC Cleaner using a clean cotton cloth or absorbed paper. Cleaned area must be dry before the solvent cement is applied.

### Important remarks :

Repeat the cleaning procedure till the waxy smooth surface of the pipe and fittings becomes matt. At temperature below +5 °C the pipe end and the socket of the fittings must be warmed up to hand temperatures.

- To avoid overheating in summer temperatures, the jointing area must be protected from the sunlight. If necessary, the pipe end with fitting may be cooled by using cold water before commencing the cementing procedure. At high temperatures, the cementing procedure should be completed within 2 minutes. In summer, it is recommended to start cementing in the early morning hours.

3. A full layer of solvent cement is immediately applied to the pipe end equal to the depth of the socket.
4. A medium layer of cement is then applied to fitting socket. The cement should not puddle wherever a belled end pipe is cemented, the area beyond the bell should not be coated with cement and it should not be allowed to run down the inside of the pipe.
5. The two parts must be assembled quickly and while the cement is still fluid, they must be held in one position without movement for a short while until initial bonding has taken place, it must be made sure that pipe and fitting are held in the right position.

For pipes with a diameter of 160mm and above, a joining tool is to be used involving two people in the operation and the joint should be held together up to 3 minutes.

The cemented joints must not be disturbed until it has initially set and the joint should not be pressure tested before the relapse of the curing time.

As a general rule test pressure should not exceed the nominal pressure by 5 bar, hence for PN 10 maximum test pressure is 15 BAR, for PN16 Maximum test pressure is 21 BAR.

Where pressure test is applied, the pipeline must be slowly filled with water from the lowest point.

Air should be removed at the highest point.

## II. INSTALLATION OF RUBBER RING UNDERGROUND UPVC PIPES :

### Pipe Trench :

The extent and distribution of earth and traffic loads affect the dimensions of the pipe trench and this is particularly important at large nominal widths. In carrying this out, the dimensions laid down by the specification or a static calculation should be held. The pipe trench should be made in such a way that all pipes are laid at a depth and can be placed perfectly.

The width and depth of the trench bottom should be such that the pipe is supported along its entire length. Appropriate depressions should be made where joints are positioned.

The pipe bedding has a considerable influence on the carrying capacity of the pipeline. It should be carried out in such a way that the bedding stresses are distributed as evenly as possible. Uneven bedding should be avoided.

The bottom of the trench should not be loosened. Any loosened soil should be dug out and replaced by special pipe bedding material, before pipes are laid. In dry stable subsoil that is free from stones, no special measures are usually necessary.

In rocky or stony subsoil the trench should be dug at least 0.15 m deeper and the excavated material replaced with a stone free layer.

## INSTALLATION OF PIPES AND FITTINGS :

Before putting the pipes and fittings into the pipe trench they should be cleaned and checked for storage and transport damage. Damaged items should be removed. If necessary, fittings should be anchored.

Cutting to length : Before the joint is made the cut ends of the pipe are chamfered.

- Smear visible surface and sealing ring with Lubricant
- Smear spigot end with Lubricant.
- Push spigot into socket up to stop.

### Repair Couplings :

These are used to replace a piece of pipe in an existing system, for a later installation of fittings and for joining pipes with no sockets.

The entire length of the slip-over socket is pushed over the chamfered pipe end. The adaptor is fitted and chamfered. The depth of socket is marked on the pipe end. The slip over socket is then slid back to the mark. Lubricant can be used generously.

Over about DN 200 the pipes cannot be inserted without mechanical assistance. If the trench bottom is firm, a crowbar can be used with a block of wood on the end of the pipe.

Changes of direction in the pipe trench : Prefabricated pipe bends are used. To a limited extent pipes can be bent without heating them.

Support for fittings with rubber ring sockets : Push fit socket joints are not longitudinally stable. In unstable soil, fittings must be supported by concrete blocks. The support strength depends on the construction of the fitting, the outside diameter of the pipe and the service pressure. Attention should be paid to permissible soil pressures.

### Filling in of pipe trench :

The pipeline is bedded in to about 0.30 m above the crown of the pipe using stone free soil compacted by hand. If necessary suitable soil should be obtained. The joints should be left exposed for the pressure test.

### Pipe Spacers :

The pipe spacers are used for spacing and aligning parallel pipelines when laid underground they also provide even and uniform distance between the lines. The spacers when laid at regular intervals of 2 meters can also act as supporters for pipelines. Also these spacers can be used to hang pipes on walls and ceilings.

The base spacer can be used along with another base spacer when laying only one line. The base spacer is also used at the top and bottom of intermediate spacers when laying several lines together.

The intermediate spacer is used along with either two or more base spacers, when multi pipelines are to be laid.

When base and intermediate spacers are used together, all possible combinations can be made for any number of horizontal or vertical laying of pipe columns and rows.

### Pipe Bends :

Bending of the pipe should be horizontal only. When the pipes are in bent condition, proper support to the pipe is essential. Please also make sure that the sand around the pipe is properly compacted. A sufficiently large bearing area of the pipe bends is required at the support. Before the concrete work starts it is recommended to envelop the bend with unsanded roofing paper. Concrete encased parts must not load the pipeline by their weight. Pipe bends should not be sawn off. With these fittings, the precision of the outer diameter at the inserting end can be guaranteed only when using pipe bends that have been supplied.

## UPVC PIPES APPLICATION AREAS :

- Potable Water distribution.
- Drainage and sewage disposal lines
- Domestic plumbing
- Soil, waste and ventilation system
- Rainwater and subsoil drainage
- Electrical cable ducting system

UPVC Pipes and fittings will not deteriorate under attack from bacteria or other micro - organisms and will not provide a medium for micro/macro organisms and fungi. These pipes and fittings are also suitable for chemical industries as they have chemical resistance to most of acids and alkalis.

UPVC are thermoplastic material hence the physical properties of these material change with variation in temperature. It is therefore important to take into account the temperature conditions when selecting class of pipe or wall thickness of pipe.

## HEALTH HAZARD INFORMATION :

### Health Effects :

**General :** There are no significant health hazards associated with PVC pipe products under normal conditions of use or from mechanical working or forming the product. All additives are encapsulated within the polymer matrix and should present no hazard under conditions of normal use and good occupational work practice. For pipes intended for use with drinking water, effect on water quality is covered by requirements of Australian standards. Peripheral effects may arise from combustion or misuse.

**Swallowed :** There are no known health effects for the ingestion of PVC

First Aid : No harmful effect. No LD50 data is available for product.

**Eye and Skin :** Inapplicable to the solid except for mechanical injury. Dust from sawing may effect eyes if not protected. Hydrogen chloride and ther fumes emitted during combustion cause irritation to the eyes and skin.

First Aid : No Special treatment. Treat mechanical injury and dust contact by normal procedures. Gaseous combustion byproducts. Irrigate with fresh water, seek medical assistance if effect persists. If molten material contacts skin and adheres, cool quickly with running water do not attempt to remove. Seek medical advice.

**Inhaled :** Inapplicable to the solid product inhalation of combustion products, especially hydrogen chloride, cause irritation of the respiratory tract. Individuals with bronchial asthma and other chronic obstructive respiratory diseases may develop broncho - spasm if exposure is prolonged.

First Aid : Gaseous combustion by products, remove from source of exposure. Seek medical advice

**Chronic :** Inhalation of PVC dust created by mechanical working has been reported to cause fine nodules visible on chest X - rays. Contact with heavy concentrations of gaseous combustion by products may result in formation of permanent scar tissue.



\*Note : Wherever the term PVC / PVC-U is used, it is meant to be UPVC (unplasticised Polyvinyl Chloride)





KUWAIT

## RIGID UPVC CONDUIT PIPES AND FITTINGS-ELECTRICAL

Khorafi Plastic Industries Company Offers a complete range of rigid PVC Conduit Pipes, accessories and fittings. The range has been designed to suit modern installation requirements and to withstand very tough site conditions found in the competitive building industry.

This catalogue covers the fast moving rigid heavy and light gauge conduits and accessories comprising of circular boxes, switch boxes, couplers, reducers and adapters etc.

Rigid PVC is corrosion resistant, self extinguishing, unaffected by most acids, aggressive atmospheres, soils, concrete and plaster.

Subjects to normal manufacturing tolerances.

Some of the relevant properties of rigid PVC are as follows:

### CHEMICAL RESISTANCE

The rigid PVC material is virtually unaffected by solutions of inorganic acids, alkalies and salts and it is also resistant to many organic chemicals. It may however be softened by some organic materials such as ketones and aromatic compounds. It will however not corrode.

### TEMPERATURE RESISTANCE

BAK Rigid PVC Conduits Pipes and Accessories have been tested to withstand the maximum temperature of 50 °C and the minimum temperature up to minus 5 C.

No painting is necessary on rigid PVC. But the rigid PVC will accept the paint finish if required.

## PROPERTIES OF RIGID UPVC PIPES & FITTINGS

<b>PHYSICAL</b>	
density .....	1.4 g/ml.
<b>MECHANICAL</b>	
flexural strength.....	700 kg/cm 9,950 psi
compressive strength.....	675-800 kg/cm <sup>2</sup> 9,600-11,400 psi
modulus of elasticity.....	35,000 kg/cm <sup>2</sup> 4,97,800 psi
<b>TENSILE</b>	
Short-term	
yield value .....	500-600 kg/cm <sup>2</sup> 7,100-8,500 psi
elongation at yield.....	2 - 4%
Long-term	
allowable circumferential stress in pipes intended for 50 years service at normal temperatures .....	60-100 kg/cm <sup>2</sup> 850-1,420 psi
<b>ELECTRICAL</b>	
volume resistivity .....	> 10 <sup>14</sup> ohm.cm
<b>THERMAL</b>	
thermal conductivity .....	4.0x10 <sup>-4</sup> cal/cm/ cm <sup>2</sup> /°C/hr 2.9x10 <sup>-4</sup> BTU/in/ ft <sup>2</sup> /°F/sec
Specific Heat.....	0.25 K cal/kg °C 0.25 BTU /lbs °F
linear coefficient of expansion.....	8x10 <sup>-5</sup> /°C 4.4x10 <sup>-5</sup> /°F
ignition by flame.....	very difficult
burning rate.....	self extinguishing

## Rigid PVC Conduit as per BSEN 50086, BS 6099 / 2 and KSS 230 & 231

Nominal Size (OD) MM	Light-Yellow Strap	Medium-Blue Strap	Heavy-Red Strap
	Wall Thickness MM	Wall Thickness MM	Wall Thickness MM
20	1.30	1.55	1.90
25	1.50	1.80	2.00
38	1.60	2.20	2.50
50	1.80	2.20	2.50

# CONDUITS AND CONDUIT FITTINGS COMPLY FOLLOWING

## 1.01 REFERENCE STANDARDS

Conduit's dimensions to BS 6099 and BS 4607 : Non - metallic conduits and fittings for electrical installations : Rigid PVC conduits and conduit fittings ( metric sizes )

## 1.02 RIGID PVC CONDUITS AND CONDUIT FITTINGS

### A. Physical Properties

1. PVC Conduit shall be high impact, non - hygroscopic, rigid PVC, unthreaded push type. Conduit and conduit fittings shall be in accordance with BS 4607 PART I - 1970 ( 20MM, 25MM ) AND BS 4607, 6099 (38MM, 50MM). The conduit and conduit fittings shall be suitable for installation at temperature - 5° C to + 50° C and they shall not soften or suffer any degradation at these temperatures, conduit and conduit fittings shall be self extinguishing type.
2. All joints shall be made with proper fittings and by using sealing cement (Vinyl Solvent Paint) to ensure a watertight joint. The cement shall be of a type that remains in a sticky condition.
3. Rigid PVC Conduit and conduit fittings shall be fully suitable for installation; storage or transport temperatures encountered in Kuwait and at this temperature the material shall not soften or suffer any structural degradation. When the temperature is above 50° C the conduits and conduit fittings should not be kept under direct sunlight for long periods.
4. All PVC Conduits are bundled by straps marked by the manufacturers name. Most of the conduit fittings are marked and identified by the manufacturer. All markings shall be indelible and easily legible.
5. The inside and outside surfaces of fittings shall be smooth and free from burrs, flash and other similar defects.
6. The interior and ends of conduit fittings shall have no sharp edges and surfaces and corners over which the cables are likely to be drawn shall be smooth and well rounded.
7. The conduit entries of fittings shall be so designed that reliable water tight joint can be made between the conduit and fittings. It shall be constructed in such a way that it will be possible to bend the conduit easily with the aid of a simple tool. e.g : Bending spring.
8. The rigid PVC material is virtually unaffected by solutions of inorganic acids, alkalies and salts and it is also resistant to many organic chemicals. It may however be softened by some organic materials such as ketones and aromatic compounds. It will however not corrode.

### B. Nominal sizes and dimensions :

1. Rigid PVC conduits shall be of one of the following nominal sizes. 20mm, 25mm, 38mm, 50mm dia. rigid PVC slip type coupler and coupling bends shall be of the same nominal sizes as the conduits and shall fit to the conduits properly.
2. Where size is not indicated, select in accordance with the regulations and as a function of the number and size of conductors.

### C. PVC Conduit Boxes

1. PVC Conduit Boxes can be used through PVC Conduit raceway system and shall comply with BS 4607.
2. All boxes shall be provided with tapped brass inserts for fixing the screws.
3. All boxes for switches, sockets, outlets, etc., shall be rigid PVC type and their dimensions shall be suitable for fixing the switches, sockets, and other accessories.

## 1.03 INSTALLATION OF CONDUIT SYSTEM :

### Sets and Bends

1. Conduits up to 25mm diameter : form on site with the bending machines using proper formers, guides, springs, etc., taking care not to deform conduit.
2. Conduits over 38mm diameter : use normal socket type bends for 90° turn.



Coupler  
20mm - 25mm - 38mm - 50mm



Female Adaptor & Nut  
20mm - 25mm - 38mm - 50mm



Double Female Adaptor & Nut  
20mm



Long Radius Bend  
20mm - 25mm - 38mm - 50mm



Saddle with Base & Screws  
20mm - 25mm - 38mm - 50mm



Junction Box 1 Way Terminal  
20mm - 25mm



Junction Box 2 Way Through  
20mm - 25mm



Junction Box 2 Way Angle  
20mm - 25mm



Junction Box 3 Way Tee  
20mm - 25mm



Junction Box 4 Way Intersection  
20mm - 25mm



Junction Box U Way  
20mm - 25mm



Junction Box Y Way  
20mm - 25mm



Junction Box H Way  
20mm - 25mm



Loop Box



Surface Switch Box  
20mm - Knock-outs - 3" x 3"



Surface Switch Box  
20mm -Knock-outs - 6" x 3"



Circular Lids - Round Type



Square Lids



Rectangular Lids



Reducer  
20mm x 25mm



Flower Cones  
22mm



G.I Surface Switch Box  
3" x 3"



G.I Surface Switch Box  
6" x 3"



Steel Insets Clips



Bending Spring  
20mm - 25mm



G.I Saddles



Insulation Tape



PVC Adhesive



White Pipe



Black Pipe



## UPVC / PVC CABLE DUCT Pipes

Pipe Dimension as per DIN 8062 Series 2 PN4 (4 BAR), Series 3 PN6 (6 BAR)

Cable Duct systems and Telephone Cable Subducts.

Installation for Inside building, Below and Aboveground Cable Systems

NORMAL SIZE	OUTSIDE DIAMETER MM		WALL THICKNESS			
			MEW	MOC	GENERAL	GENERAL
MM	MIN	MAX	MM	MM	MM	MM
50	50.0	50.2		3.0	1.8	2.4
75	75.0	75.3	2.6		1.8	2.2
110	110.0	110.3	3.2	4.5	2.2	3.0
160	160.0	160.4	3.6	5.0	3.2	2.5
200	200.0	200.4			4.5	

Standard Length : 3, 4 and 6 Meters

Colour : Grey Colour

Socket : Solvent Weld Socket

## UPVC / PVC CABLE DUCT ACCESSORIES



End Socket Plug  
50mm - 75mm - 110mm - 160mm



End Cap  
50mm - 75mm - 110mm - 160mm



Coupler / Socket  
50mm - 75mm - 110mm  
160mm - 200mm

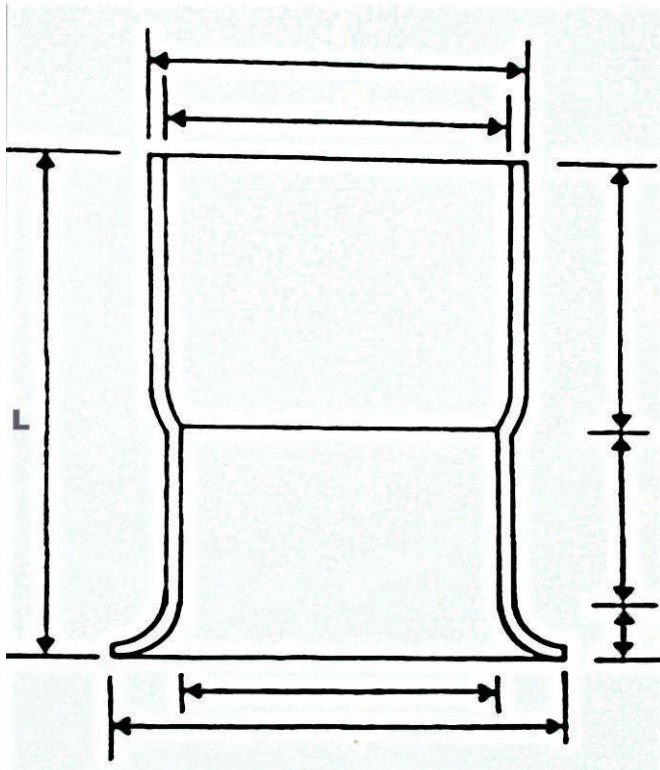
## UPVC Cable Duct Accessories - Bell Mouth

### Bell Mouth with Socket end - Grey colour :

Following are our standard size and length of Bell Mouths :

Size	Thickness	Length (L)
50mm	2.4mm	100mm
75mm	2.2mm	130mm
90mm	2.7mm	130mm
110mm	3.2mm	180mm
110mm	4.5mm	180mm
160mm	3.6mm	220mm
160mm	4.7mm	220mm
200mm	4.5mm	280mm
250mm	6.1mm	280mm

Special Bell Mouth - on request		
Size	Thickness	Length
50mm	2.4mm	225 mm
110mm	3.2mm	225 mm
160mm	3.6mm	225 mm
200mm	4.5mm	225 mm



## UPVC LONG RADIUS BENDS

Khorafi Plastic Industries Company can supply bends fabricated from extruded Pipes which Comply to International standards.

Following are the standard lengths and angle of installation for Long Radius Bends :

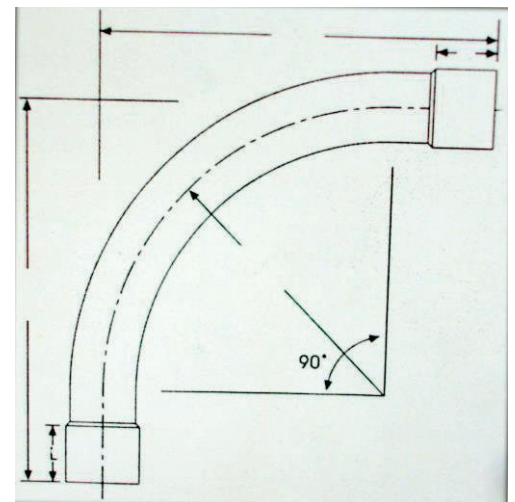
### For Electrical / Cable Ducts / Drainage and Sewage use - light duty :

Size & Thickness	Angle in degree	Length of Bend	Radius
50mm x 1.8mm	90° or 45°	54 cms	220
75mm x 1.8mm	90° or 45°	75 cms	260
75mm x 2.6mm	90° or 45°	75 cms	260
90mm x 2.7mm	90° or 45°	99 cms	315
110mm x 3.2mm	90° or 45°	100 cms	385
110mm x 4.5mm	90° or 45°	100 cms	385
160mm x 3.6mm	90° or 45°	150 cms	560
160mm x 4.7mm	90° or 45°	150 cms	560
200mm x 4.5mm	90° or 45°	152 cms	705



### For Water line / Cable duct / Electrical use - Heavy duty bends - dark grey :

Size & Thickness	Angle in degree	Length of Bend	Radius
50mm x 2.4mm	90° or 45°	54 cms	220
50mm x 3.7mm	90° or 45°	54 cms	220
63mm x 3.0mm	90° or 45°	57 cms	221
63mm x 4.7mm	90° or 45°	57 cms	221
75mm x 3.6mm	90° or 45°	77 cms	263
75mm x 5.6mm	90° or 45°	77 cms	263
90mm x 4.3mm	90° or 45°	99 cms	315
90mm x 6.7mm	90° or 45°	99 cms	315
110mm x 5.3mm	90° or 45°	100 cms	385
110mm x 8.2mm	90° or 45°	100 cms	385
160mm x 7.7mm	90° or 45°	150 cms	560
200 mm x 9.6mm	90° or 45°	152 cms	705



- Note :**
- Both ends socketed - Adhesive joint.
  - Colour : Light grey or dark grey.
  - 30 and 15 degree bends can be manufactured on request.
  - One end socketed bends are available on request.

## UPVC CABLE DUCT ACCESSORIES

### SPACER BASE AND SPACER INTERMEDIATE :

Khorafi Plastic Industries Company's Pipe Spacers are made with good quality and excellent design for strength. These Pipe Spacers are used for spacing and aligning parallel pipelines when laid underground. They also provide even and uniform distance between the lines. The spacer when laid at regular intervals of two meters can also act as supporters for pipe lines. Also these spacers can be used to hang pipes on walls and ceilings.

Pipes Spacers consist of two parts :

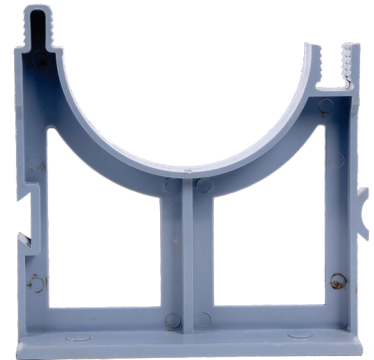
1. Base Spacers : can be used along with another Base Spacer when laying only one line. The Base Spacer is also used at the top and bottom of Intermediate Spacers when laying several lines together.
2. Intermediate Spacers : is used along with either two or more Base Spacers when multi pipelines are to be laid.

When Base and Intermediate Spacers are used together, all possible combinations can be made for any number of horizontal or vertical laying of pipe columns and rows.

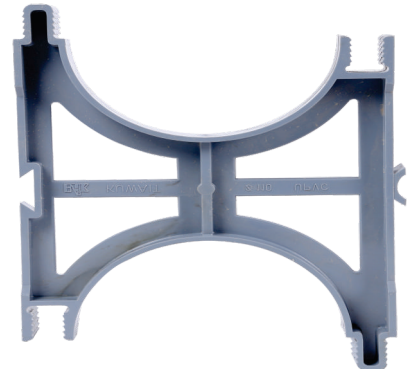
Horizontal locking spacers have a specially designed V shape taper groove and half round taper projection system on the sides. These grooves and projections make it possible for spacers to give horizontal connections. Projections are tapered and fit snugly in the grooves and provide a very strong locking grip.

Vertical locking spacers can also be joined vertically by way of inserting each other in male – female type of serrated lug and slot system. These are designed to withstand the normal pushing and pulling load when they are laid under the ground. Indications are given on spacers for proper assembly.

BASE SPACER

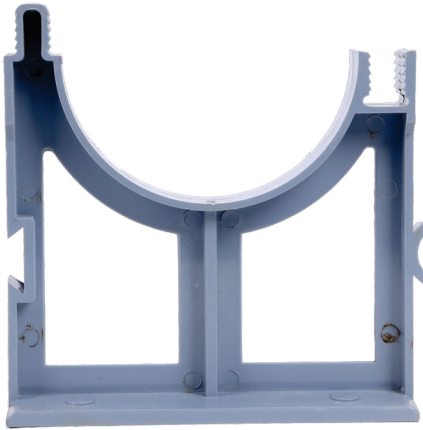


SPACER INTERMEDIATE

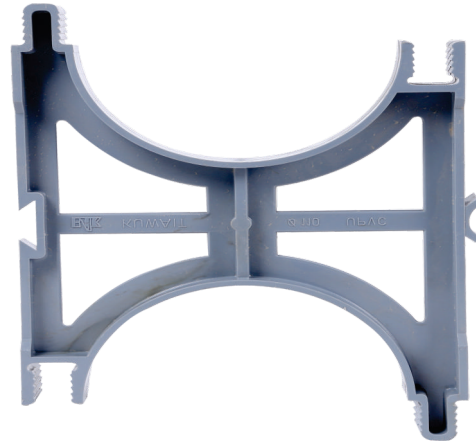


Khorafi Plastic Industries Company produces Spacers for diameter **110mm** and **160mm** PVC Cable Ducts. Spacers are designed to withstand loads at extreme weather temperature of the Arabian Gulf region.

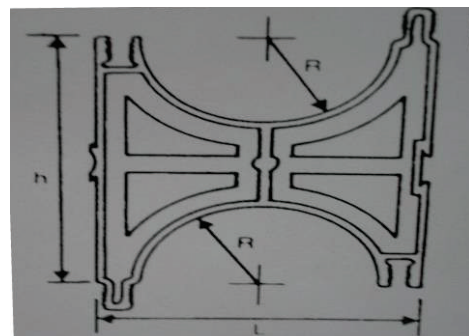
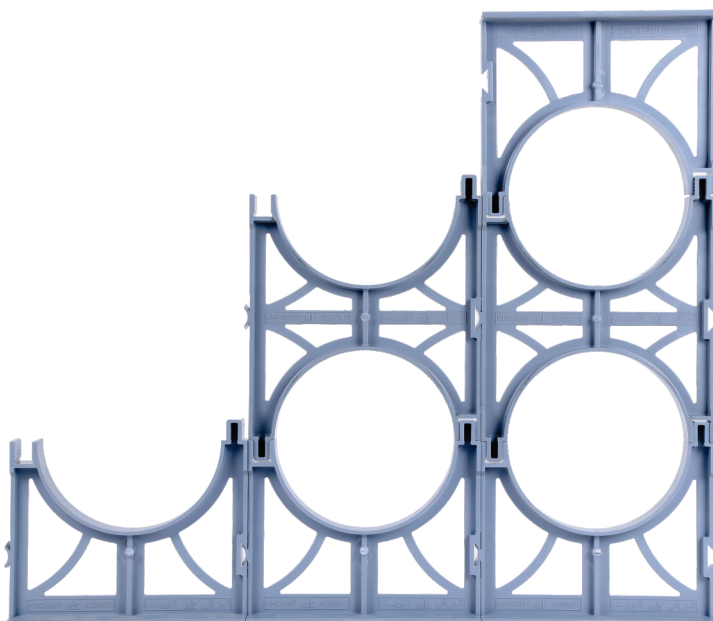
**BASE SPACER**



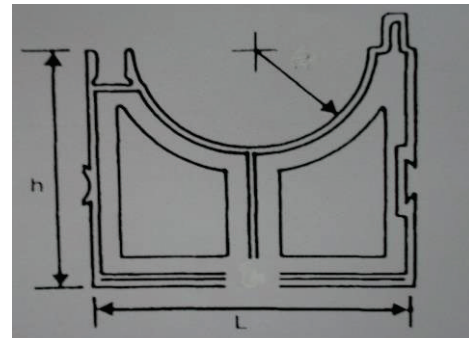
**SPACER INTERMEDIATE**



**SPACER BASE AND SPACER INTERMEDIATE MULTI ASSEMBLY**



h = 22cms  
L = 21cms  
R = 8cms



h = 16cms  
L = 21cms  
R = 8cms



## UPVC / PVC Sewage & Drainage Pipes

Pipe Dimension as per DIN 19531, 19534 & 8062, BS 4514, BS 5255, BS 4660, BS 5481

Installation for Discharge System Inside building, Soil and Ventilation, Waste and Sewerage system, Belowground Drainage & Sewerage System  
Gravity Sewerage System, Rain Water, Aboveground Drainage system

NORMAL SIZE	OUTSIDE DIAMETER MM		WALL THICKNESS MM				
	MIM	MAX	DIN 8062 4 Kg/cm <sup>2</sup>	DIN 8062 6 Kg/cm <sup>2</sup>	DIN 19534	DIN 19531	Special MM
40	40.0	40.2				1.8	2.2
50	50.0	50.2		1.8		1.8	2.2
75	75.0	75.3	1.8	2.2		1.8	2.6
110	110.0	110.3	2.2	3.2	3.0	2.2/3.0	1.8
160	160.0	160.4	3.2	4.7	3.6	3.2/3.6	2.5/2.8
200	200.0	200.4	4.0		4.5		

Standard Length : 3, 4 and 6 Meters

Colour : Grey and Orange Colour

Socket : 40mm Plain end Pipe and 50mm to 200mm Solvent Weld Socket.

## Properties of UPVC / PVC Pipes

Vicat Softening Temperature @ 1 Kg. Load	85 °C
Vicat Softening Temperature @ 5 Kg. Load	80 °C
Specific Gravity	= 1.45 gram / cm <sup>3</sup>
Water Absorption	less than 4 mg / cm <sup>2</sup>

## UPVC / PVC Sewage & Drainage Fittings

Pipe Fittings as per DIN 19531, 19534 & 8062, EN / BS EN / 1329 / 1401



Elbow 90° (87.5°)  
50mm - 75mm 110mm - 160mm



Elbow 45° Two Side Socket  
50mm - 110mm



Elbow 45° One Side Socket  
75mm - 110mm - 160mm



Coupler (Socket)  
50mm - 75mm - 110mm - 160mm - 200mm



Tee "Y" Branch 45°  
50mm - 110mm



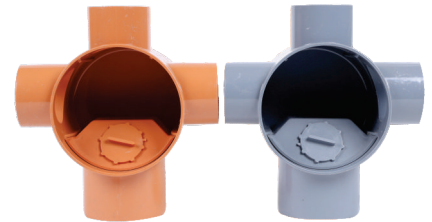
Tee Equal 90° Socketed  
50mm - 75mm - 110mm - 160mm



P - Trap  
110mm



Access Plug with Threaded Cap  
(Cleanout)  
50mm - 110mm - 160mm



Floor Drain Traps  
110 x 75 x 50mm



Ventilation Cowl  
110mm - 75mm - 50mm



Threaded Elbow 90°  
50mm x 1 1/2"



End Cap  
50mm - 75mm - 110mm - 160mm



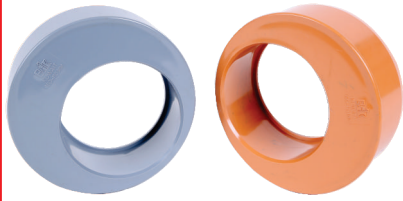
Reducing Tee 45°  
160 x 110mm



Socket Plug  
50mm - 75mm - 110mm - 160mm



Reducing Coupler  
110 x 50mm - 110 x 75mm



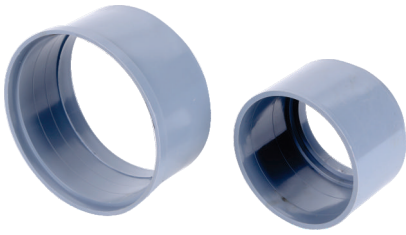
Reducer Bush  
110 x 50mm - 110 x 75mm  
110mm x 63mm - 160 x 110mm



Access Plug with Threaded Cap  
50mm



P - Trap  
50mm



Floor Trap Extension  
110mm - 160mm



U - Trap  
50mm - 110mm



Coupler - Rubber Socket  
110mm



Elbow 90° - 110mm RR



Elbow 45° - 110mm RR



Tee 90° - 110mm RR



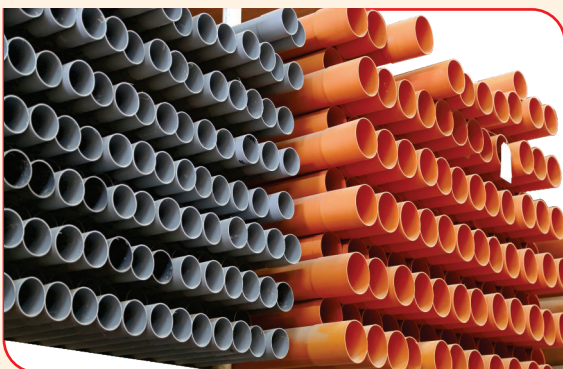
Tee Y 45° - 110mm RR



PVC Adhesive - USA



PVC Cleaner - USA



Pipe



Pipe

## UPVC / PVC PRESSURE PIPES

### UPVC / PVC Pressure Pipes Dimensions As per DIN 8061 / 8062

UPVC / PVC Pressure Piping system is using for Underground and inside building, Aboveground installation, Drinking water installation & irrigation water system and Electrical System. UPVC / PVC Piping system do not rust, scale or corrode. UPVC / PVC Pipes are not chemically reactive with the drinking water they convey. UPVC / PVC Piping system do not adversely affect water quality or taste.

NORMAL SIZE	OUTSIDE DIAMETER MM		WALL THICKNESS MM					
	MIM	MAX	Series 1 Ventilation	Series 2 PN 4	Series 3 PN 6	Series 4 PN 10	Series 5 PN 16	General SPL
20.0	20.0	20.2					1.5	2.3
25.0	25.0	25.2				1.5	1.9	2.8
32.0	32.0	32.2				1.8	2.4	3.6
40.0	40.0	40.2			1.8	1.9	3.0	
50.0	50.0	50.2			1.8	2.4	3.7	
63.0	63.0	63.2			1.9	3.0	4.7	
75.0	75.0	75.3		1.8	2.2	3.6		2.6
110.0	110.0	110.3	1.8	2.2	3.2			4.5
160.0	160.0	160.4		3.2	4.7			3.6/5.0
200.0	200.0	200.4		4.0				4.5

## Properties of UPVC / PVC Pipes

Vicat Softening Temperature @ 1 Kg. Load	85 °C
Vicat Softening Temperature @ 5 Kg. Load	80 °C
Specific Gravity	= 1.45 gram / cm <sup>3</sup>
Water Absorption	less than 4 mg / cm <sup>2</sup>

Standard Length : 3, 4 and 6 Meters

Colour : Grey

Socket : Solvent Socket and Plain end Pipes



## UPVC / PVC Pressure Pipes Fittings Manufactured According to DIN 8063

UPVC / PVC Pressure Pipes Fittings using for Pressure Water Line, Electrical System, Cable Duct System, Drainage System. PN 16 BAR



Elbow 90°

20mm - 25mm - 32mm - 40mm  
50mm - 63mm - 90mm - 110mm



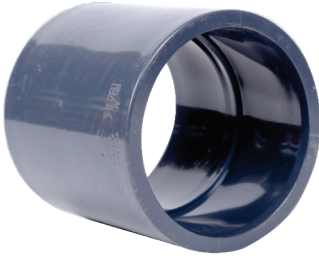
Elbow 45°

50mm - 63mm - 90mm - 110mm



TEE 90°

25mm - 32mm - 50mm  
63mm - 90mm - 110mm



Double Socket

25mm - 32mm - 40mm - 50mm  
63mm - 90mm - 110mm



TEE "Y" 45°

63mm



Union

25mm - 32mm - 63mm



Male Adapter

25mm x 3/4" - 32mm x 1" - 50mm x 1 1/2"  
63mm x 2" - 75mm x 2 1/2" - 90mm x 3" - 110mm x 4"



Female Adaptor

25mm x 3/4" - 32mm x 1" - 50mm x 1 1/2"  
63mm x 2" - 75mm x 2 1/2"



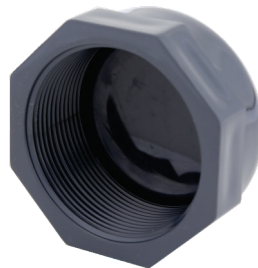
Short Reducing Bushes

25 x 20mm - 32 x 20mm - 32 x 25mm - 40 x 25mm - 40 x 32mm  
50 x 25mm - 50 x 32mm - 50 x 40mm  
63 x 25mm - 63 x 32mm - 63 x 40mm - 63 x 50mm - 110 x 50mm  
110 x 63mm - 110 x 75mm - 110 x 90mm



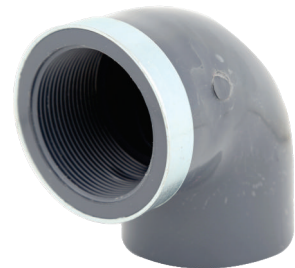
Flange Socket Type

63mm - 110mm



Female Threaded End Cap

50mm (1 1/2") - 63mm (2")



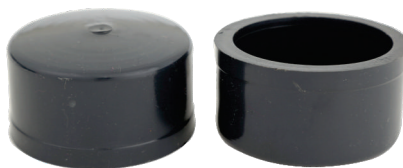
Female Threaded Elbow 90°

50mm x 1 1/2" - 63mm x 2"



Female Threaded Tee 90°

50mm x 1 1/2" x 50mm  
63mm x 2" x 63mm



End Cap

25mm - 32mm - 50mm - 63mm - 75mm



Long Radius Bend 90° / 45°

50mm - 63mm - 75mm - 90mm  
110mm - 160mm - 200mm

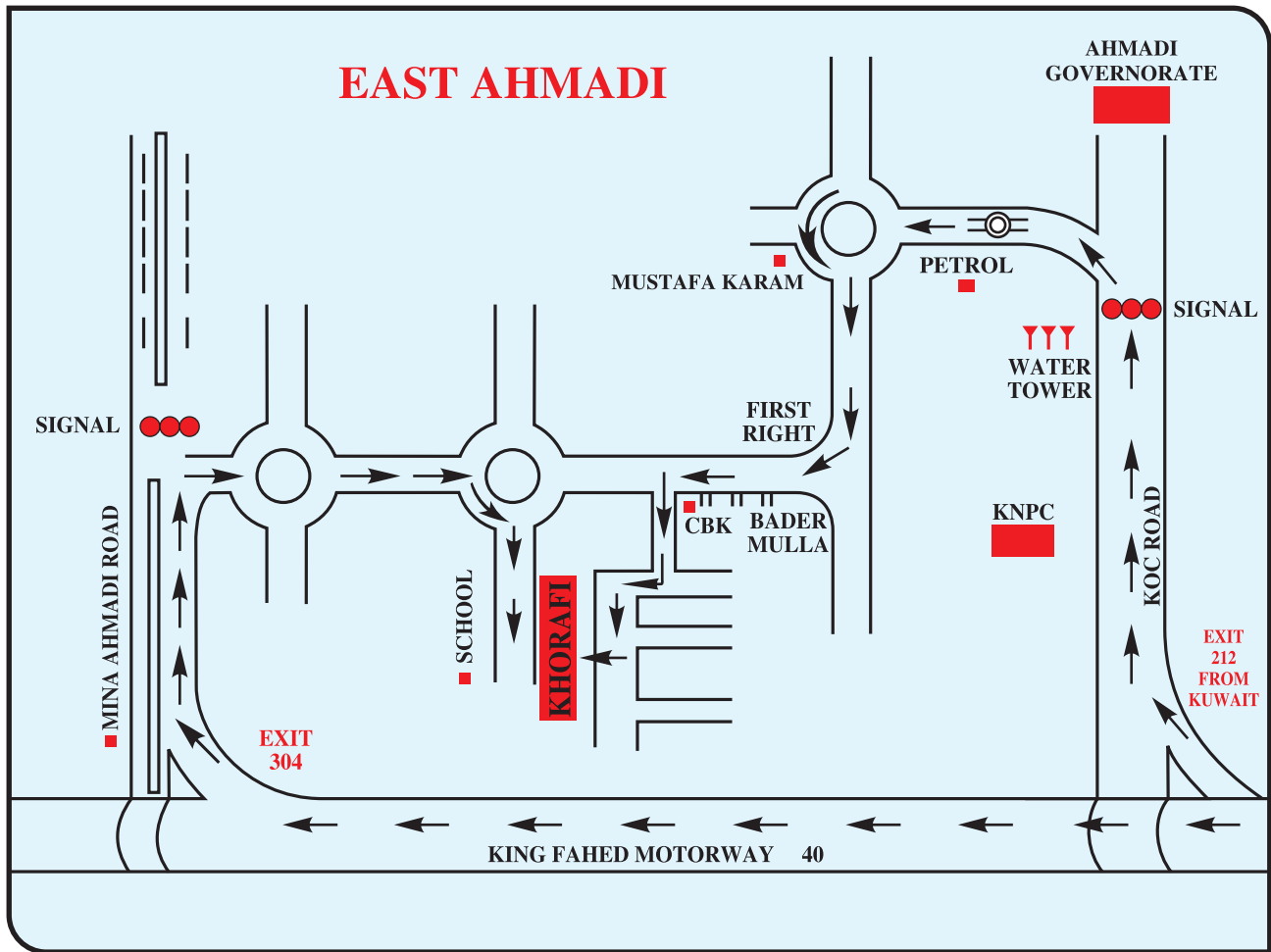


## الموقع

شرق الأحمدى - المنطقة الصناعية - قطعة ٦ - قسيمة ٣٥، ٣٦، ٣٧ - خلف البنك التجاري - فرع شرق الأحمدى

## LOCATION

EAST AHMADI, INDUSTRIAL AREA - BLOCK 6 - AREA 35, 36, 37  
NEAR COMMERCIAL BANK BRANCH





# KUWAIT

شركة الخرافي لصناعات البلاستيك

**KHORAFI PLASTIC INDUSTRIES COMPANY**

P.O. Box : 9948 Ahmadi  
610610 Kuwait

**UPVC / PVC PIPES  
FITTINGS & ACCESSORIES**

ص.ب : ٩٩٤٨ الأحمدى  
٦١٠١٠ - الكويت

شرق الأحمدى - المنطقة الصناعية - قطعة ٦ - قسيمة ٣٥، ٣٦، ٣٧ - خلف البنك التجاري - فرع شرق الأحمدى

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