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1. INTRODUCTION

DELTA FIT the leading manufacturer of uPVC pipes fittings and Main Hole Covers at their plant **DELTA** Industries Lahore.

DELTA FIT manufacturing a wide range of uPVC pipes, fittings, main hole covers, Delta pipe work system (which) used by many industries in Pakistan for food, chemicals, beverage production, Sewerage, Water supply as well as construction industry like housing and multistoried buildings etc.

DELTA FIT use modern production technologies, It develops & uses up-to-date technology and materials to maintain high quality, cost effective and environment friendly products.

2. DESIGNING WITH UNPLASTICISED POLYVINYL CHLORIDE

The use of plastic pipes in the commercial and residential fields has grown very rapidly in the last few years.

The plastic material that offers the best advantage from a Price Point of View, as well as an exceptional resistance to corrosion and low cost installations of PVC.

Un-Plasticised polyvinyl chloride has properties, which allow it to be used as a replacement for, and often give it advantages over, more traditional material such as steel, cast iron, asbestos cement, clay and wood.

The impact strength of uPVC is vary dependent on the formulation. It can be at least as high as that of nearly all other thermoplastics.

It's greatest benefit is it's high modulus per unit cost, and it is therefore most commonly used in load bearing such as pressure application.

It also has other features, which are of great value to the designer, for example it's low density, good chemical resistance and self-extinguishing.

These properties are coupled with an ease of processing, which allows the finished products to be produced easily and economically particularly by extrusion.



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3. GENERAL PROPERTIES OF uPVC PIPING SYSTEM.

■ **CORROSION FREE**

uPVC pipe fitting system resist both acid and alkalis, so they can be ruled out any possible formation of corrosion.

■ **LIGHT AND RIGID**

Weight ratio 1: 5.5 of iron & 1:7.7 of lead, and also their tensile strength is 1: 3 of iron & 1 : 4 of lead. The following table shows comparative data between uPVC and other materials.

	SPECIFIC GRAVITY (SP. GR)	TENSIL STRENGTH (T.S) Kg/sq.mm	SP.GR/T.S kg/sq.mm
BP uPVC Pipe	1.4 - 1.45	5 - 6	3.5 - 4.5
IRON	7.85	18 - 25	2.3 - 3.2
LEAD	11.0	1.1 - 1.8	0.1 - 0.16
ALUMINIUM	2.7	9 - 16	3.3 - 6.0
RUBBER	0.97 - 1.06	1.7 - 2.5	1.6 - 2.6
PORCELAIN	2.4	0.4 - 0.5	0.17 - 0.2

■ **CONSTANT FLOW**

The internal surface of uPVC pipe fitting systems are smooth and corrosion free, therefore, they permanently maintain a constant flow rate.

■ **CHEMICAL RESISTANCE**

uPVC pipes and fittings are unaffected by water, domestic sewage or soil. If hydrochloric or sulphuric acids are being conveyed in the pipes, the standard working pressure can be used even when the acids are concentrated. In the case of concentrated nitric acid, it is necessary to go one class higher than indicated, and for an alcohol or 10% sodium hydroxide, two classes higher than indicated is recommended.

■ **SAVE FROM ELECTRIC SHOCK**

uPVC pipes have superior physical properties of low electrical conductivity and high dielectric strength; therefore they are suitable for electrical application.

DIELECTRIC STRENGTH (kv/mm)	uPVC PIPE	MICA	PORCELAIN	EBONITE
	28 - 50	15 - 78	8 - 25	10 - 70

■ **NON-INFLAMMABLE**

uPVC pipe fitting system do not support combustion and are fire proof since they are self extinguishing.

■ **LOW HEAT CONDUCTIVITY**

Since uPVC Pipe fitting System are low in heat combustion, water temperature may be maintained at lower than 60°C throughout the piping system.

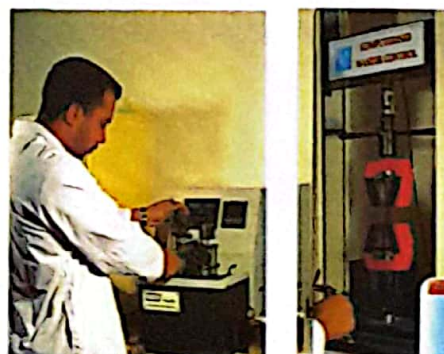
■ **EASY HANDLING AND INSTALLATION**

Since uPVC pipe & fitting system soften at a temperature of about 83 C, both bending by heat and connecting the pipes with solvent cement can be done freely and without any loss in performance.

4. QUALITY CONTROL AND INSPECTION ASSURANCE

Comprehensive evaluation of raw-materials and finished products for pipes and fittings are conducted in our production facilities and laboratories on a routine basis and within a complete system of quality control. Each lot of production is assigned a batch No. Which enables us to trace out our production at every stage. Tests are as per international standards and acceptance sampling procedures for production quality control and lot testing are done during all production operations.

- Management is committed to provide resources and the right environment in which each employee can develop skills, talents and ideas to a never ending process of improvement and innovation on all aspects of our business.



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5. DELTA PRODUCTS

(a) DELTA FITTINGS SYSTEM

uPVC (unplasticised polyvinyl chloride) is one of the well known thermoplastic materials used for manufacturing pipe and fitting system in all over the world. Delta Fittings systems are manufactured by using the latest machines equipped with state of the art technology. Delta fittings are manufactured in accordance with the American standard Test method (ASTM) 2465 / 2466 SCH 40 requirements. Connection can be made by DELTA FIT solvent cement. Delta Fittings are available in sizes, "½ up to "6 in white color. Grey color is available on request.



APPLICATION OF DELTA PIPES

- ★ Supply for Drinking Water
- ★ Ventilation & Ducting
- ★ Tube well Casing and Strainer
- ★ Irrigation and Agriculture
- ★ Drainage and Sewerage
- ★ Fire Fighting
- ★ Electricity Wiring
- ★ Chemicals Transportation
- ★ Fishery and Sea Water Treatment

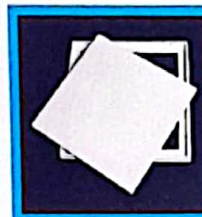
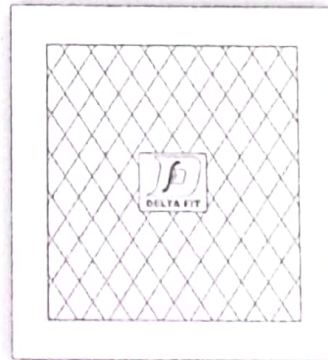


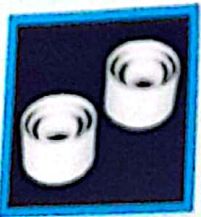
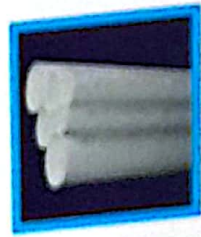
(b) DELTA FIT MAIN HOLE COVERS

- ★ DELTA FIT introducing first time in Pakistan uPVC Main Hole Covers.
- ★ Main Hole Covers not only meet International standard but also cover the local environment and demands of our customers.
- ★ Main Hole Covers bearing the pressure test in laboratory and its quality control.
- ★ Main Hole Covers are in square and round shapes these are in following sizes: 6", 9", 12" & 18".
- ★ Main Hole covers are available in white colour, Grey Colour is available on request.

APPLICATION OF DELTA FIT MAIN HOLE COVERS

- ★ Housing and Multistoried Buildings
- ★ Drainage and Sewerage
- ★ Swimming Pools
- ★ Supply of Drinking Water
- ★ Ventilation and Ducting
- ★ Hidden Water Supply Lines





(c) DELTA PIPES

- ★ **DELTA FIT** manufacturing wide range of uPVC pipes in different sizes ($\frac{1}{2}$ up to 14) & International standards like BSIL (British standard Institute England) & PSI (Pakistan Standard Institute).
- ★ **DELTA PRESSURE PIPES** as per PSI Specification PS - 3051 / 91 equivalent to BS 3505.
- ★ **DELTA PIPES SWV** (soil, waste and ventilation) as per BS 4514 / BS - EN - 1329.
- ★ **DELTA PIPES CONDUITS** as per PSI Specification PS - 1905 equivalent to BSS - 6099.
- ★ **DELTA PIPES** Made accordance to ASTM standard D-1785 Schedule 40 & for high pressure and D-2241 SDR series for low pressure.

APPLICATION OF DELTA PIPES

- ★ Supply for Drinking Water
- ★ Ventilation & Ducting
- ★ Tube well Casing and Strainer
- ★ Irrigation and Agriculture
- ★ Drainage and Sewerage
- ★ Fire Fighting
- ★ Electricity Wiring
- ★ Chemicals Transportation
- ★ Fishery and Sea Water Treatment



STANDARD SPECIFICATION

DELTA PIPES uPVC PRESSURE FOR COLD POTABLE DRINKING WATER AS PER

PSI SPECIFICATION PS-3051 / 91 EQUIVALENT TO BS 3505



DELTA PIPES uPVC Wall Thickness			PRESSURE CLASS - B 200FT HEAD (6 BAR) 87 Lbs / In 2		PRESSURE CLASS - C 300FT HEAD (9 BAR) 130 Lbs / In 2		PRESSURE CLASS - D 400FT HEAD (12 BAR) 173 Lbs / In 2		PRESSURE CLASS - E 500FT HEAD (15 BAR) 217 Lbs / In 2	
Nominal Size	Mean Outside Diameter (mm)		Value (MM)		Value (MM)		Value (MM)		Value (MM)	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
1/2	21.2	21.5							1.7	2.1
3/4	26.6	26.9							1.9	2.5
1	33.4	33.7							2.2	2.7
1.1/4	42.1	42.4					2.2	2.7	2.7	3.2
1.1/2	48.1	48.4					2.5	3.0	3.1	3.7
2	60.2	60.5			2.5	3.0	3.1	3.7	3.9	4.5
2.1/2	75.0	75.3			3.0	3.5	3.9	4.5	4.8	5.5
3	88.7	89.1	2.9	3.4	3.5	4.1	4.6	5.3	5.7	6.6
4	114.1	114.5	3.4	4.0	4.5	5.2	6.0	6.9	7.3	8.4
5	140.0	140.4	3.8	4.4	5.5	6.4	7.3	8.4	9.0	10.4
6	168.0	168.5	4.5	5.2	6.6	7.6	8.8	10.2	10.8	12.5
7	193.5	194.0	5.2	6.0	7.7	8.9	10.1	11.7	12.4	14.3
8	218.8	219.4	5.3	6.1	7.8	9.0	10.3	11.9	12.6	14.5
10	272.6	273.4	6.6	7.6	9.7	11.2	12.8	14.8	15.7	18.1
12	323.4	324.3	7.8	9.0	11.5	13.3	15.2	17.5	18.7	21.6
14	355.0	356.0	8.5	9.8	12.6	14.5	16.7	19.2	20.5	23.6

Weights:

The specifications do not give specific weights.
However approximate weights are given for estimation purposes.

Size Inch	B - Class Kg / m	C - Class Kg / m	D - Class Kg / m	E - Class Kg / m
1/2				0.15
3/4				0.22
1				0.32
1.1/4			0.41	0.50
1.1/2			0.54	0.65
2		0.68	0.82	1.03
2.1/2		1.01	1.20	1.58
3	1.17	1.41	1.82	2.22
4	1.78	2.32	3.03	3.65
5	2.44	3.49	4.55	5.65
6	3.46	5.01	6.57	7.59
8	5.30	7.72	10.04	12.17
10	8.26	11.97	15.59	19.89
12	11.55	16.85	21.91	26.68
14	13.87	20.27	26.49	32.16



INTRODUCTION DELTA PIPES



ASTM D-1785 SCHEDULE 40

Nominal Size Inches	Outside Dia mm	Wall thickness mm		Nominal Weight Kg/m	Pressure Rating Bar
		Min	Max		
1/2	21.34	2.77	3.20	0.24	41.4
3/4	26.67	2.87	3.38	0.33	33.1
1	33.40	3.30	3.89	0.48	31.0
1.1/4	42.16	3.56	4.00	0.65	25.5
1.1/2	48.26	3.68	4.19	0.7	22.8
2	60.32	3.91	4.42	1.04	19.3
2.1/2	73.12	5.15	5.77	1.62	20.5
3	88.00	5.49	6.15	2.14	17.9
4	114.30	6.02	6.73	3.05	15.2
6	168.28	7.11	7.98	5.37	12.4
8	219.08	8.18	9.20	8.11	11.0

ASTM D-2241 SDR SERIES

Nominal Size Inches	Outside Dia mm	Wall thickness mm	Nominal Weight Kg/m	Pressure Rating Bar
3 SDR 32.5	88.90	2.7	1.093	8.62
3 SDR 26	88.90	3.5	1.417	11.0
4 SDR 41	114.30	3.2	1.667	6.89
4 SDR 32.5	114.30	4.0	2.082	8.62
4 SDR 26	114.30	4.5	2.333	11.0
6 SDR 64	168.28	3.2	2.450	4.34
6 SDR 41	168.28	4.5	3.445	6.89
6 SDR 32.5	168.28	5.2	3.987	8.62
8 SDR 41	219.08	6.0	5.988	6.89
8 SDR 32.5	219.08	7.0	6.987	8.62

DELTA PIPES uPVC ELECTRICAL CONDUITS:

uPVC Conduits For Electrical Use As Per - 1905 Equivalent To Bss - 6099
Dimension Of DELTA PIPES uPVC Electrical Conduits

Nominal Size	Outer diameter mm		Wall thickness mm		Weight kg / m	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
1/2	17.0	17.3	0.96	1.18	0.070	0.084
3/4	21.2	21.5	1.09	1.29	0.098	0.117
1	26.6	26.9	1.16	1.36	0.133	0.156
1.1/4	33.4	33.7	1.44	1.67	0.207	0.241
1.1/2	42.1	42.4	1.60	1.84	0.292	0.335
2	60.2	60.5	1.70	1.90	0.447	0.500
3	88.7	89.1	1.80	2.00	0.680	0.700
4	114.1	144.5	1.90	2.10	0.940	0.960



DELTA PIPES uPVC are available in 4, 5 and 6 meter lengths.

DELTA PIPES uPVC in plain ends & socketed ends can be supplied on request.

DELTA PIPES uPVC are available in white and grey colours.

DELTA PIPES uPVC can also be supplied in shorter or longer lengths.

6 GENERAL METHODS FOR JOINING uPVC PIPE SYSTEM Solvent Cement Joints (uPVC TO uPVC)

Solvent jointing is used with spigot with socket type joints in pipe and fittings in which the socket and spigot have a close fit. Only factory formed sockets shall be used in making such joints.

The jointing procedure should be as follows:

- The spigot end be cut square and all burrs removed from the outside and inside edges.
- The spigot should be marked with a pencil line at a distance equivalent to the internal depth of the socket. Alternative methods of marking may be used provided that they do not damage the pipe. Scoring of pipe is not permitted.
- The joint should be tested for dry fit. Where pressure pipes are used interference fit shall be reached before the penciled mark is reached.
- The area between the pencil mark and the spigot end should be dried and then cleaned and degreased with a cloth moistened with the pipe or fitting manufacturer's specified cleaning fluid. The interior of the socket should be similarly dried, cleaned, and degreased.
- Using clean, suitably size, dry brushes or applicators, which will not contaminate the solvent cement, the joints should be created with solvent cement complying as follows:
 - I. For interference fit joints with any type of solvent cement, or for clearance fit joints where a gap-filling solvent cement is used. A coating of solvent cement should be applied evenly to the internal surface of the socket for the full engagement length, and then to the external section of the spigot up to the mark. The socket coating is as light as possible to minimize the accumulation of excess solvent in the socket after jointing.
 - II. For clearance fit joints with non gap filling solvent cement. A light coating of solvent cement should be evenly applied to the internal surface of the socket for the full engagement length. The marked section of the spigot should then be coated with solvent cement and left until touch dry. A second coating should then be applied to the socket and spigot end, while the surface is still wet; the spigot end should be inserted and bottomed in the socket. The joint should be firmly restrained for a period of at least 30 seconds and no t disturbed for 5 min., Or as recommended by the manufacturer of the cement.

