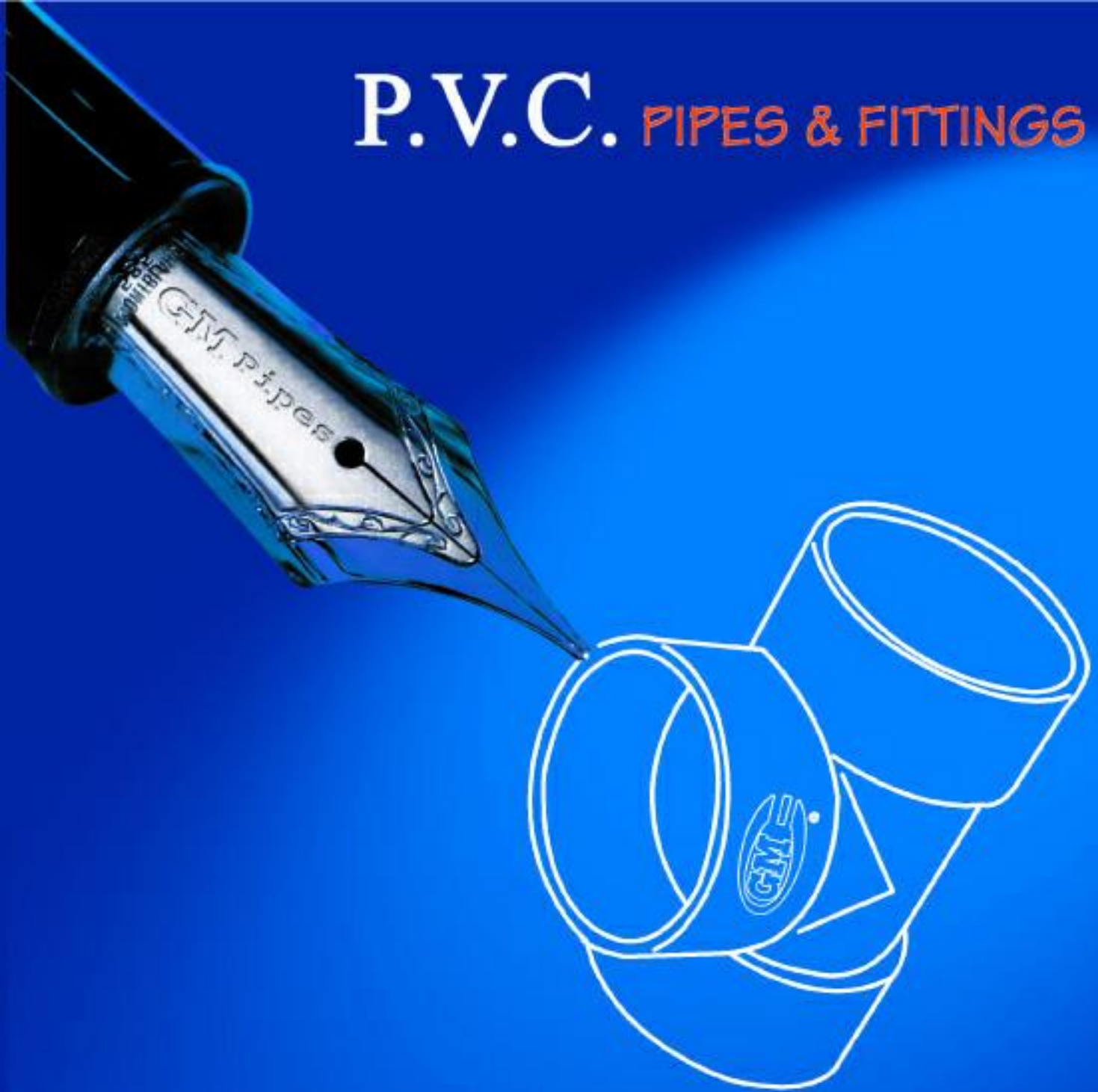


P.V.C. PIPES & FITTINGS



GM pipes & fittings

مواسیر و وصلات جی.ام



ASTM STANDARD



- **High technological mixers**



- **Sophisticated quality control procedures**



- **Storage area for pipes & fittings**



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FOREWORD

Gulf Manufactures “GM”, was established in 2000 in the 6th of October City, **Arab Republic of Egypt** on an area of 40,000 m² and with annual production capacity of 50,000 ton, with a previous experience in plastic production from **Arabian Gulf Manufacturers “AGM”**, which is one of the first major plastic processor in the **Kingdom of Saudi Arabia** established in 1965. Today, they are the leader throughout the Kingdom, Gulf and other Arabian Countries markets, offering a wide range of plastic products including injection molded fittings, extruded profiles and thermoformed products.

As this previous experience and quality, **GM** started from the end of others with very advanced technique in manufacturing, quality control and marketing, to meet the customers need and imagination, and the highest quality of our products with a very reasonable price.

GM UPVC & CPVC pipes and fittings used for national and international purposes, according to the international standards like ASTM, DIN & BS.

GM PVC pipes and fittings are widely used by the world's contractors in their respecting projects in the whole Middle East region.

Our immaculate product quality reaches us to the confidence of customers all over the world

GM was the first to initiate marketing oriented technique to meet increasing industrial demand by gearing production to market requirements for development of its range of UPVC & CPVC pipes and fittings

GM UPVC & CPVC pipes and fittings are now well accepted and widely used in all types of industrial process pipework, water and gas reticulation and distribution systems, as well as irrigation installation, together with electrical and telecom supply conduit and flexible corrugated pipe.

GM also has the technical ability to produce PVC compound from its initial raw materials with a high accuracy of mixing ratios according to customers need and international standards with high production capacity.

We have all these processing facilities under the cover of one roof. This is fairly unique and first of this type in the entire region. More importantly, in brief, we are committed to live through the needs of our valuable customers at all times.



GM pipes & fittings

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MANAGEMENT RESPONSIBILITY AND QUALITY POLICY :

We are committed to assess the quality of raw materials, semifinished goods and the final products at various stages of the production process.

- a-* We are committed to ensure that the whole production process operates according to the desired set standard and in case of any deviations, necessary corrective measures are to be taken.
- b-* We are committed to suggest measures and plans to improve the standard of goods produced without much cost escalation.
- c-* We are committed to develop quality consciousness among the various sections of our industrial units.
- d-* In brief, we are committed to ensure the quality standard of the finished products.





PRODUCT INFORMATION



AMERICAN SOCIETY FOR
TESTING AND MATERIALS

All products manufactured by “GM for Pipes and Fitting” have to pass through our stringent Quality Control procedures. GM Pipes & fittings are manufactured as per :-
AMERICAN SOCIETY FOR TESTING AND MATERIALS
(ASTM) STANDARD.

GM PVC Pipes and Fittings
bear the trademark :



GM Pipes & Fittings

مواسير و وصلات جي ايم

GM PVC Pipes and Fittings
are produced in conformity with
the appropriate specifications

Product Applications :-

- UPVC Pipes for water supply.
- UPVC Pipes for irrigation systems.
- UPVC Pipes for waste and ventilation.
- UPVC Pipes for drainage and sewer systems.
- CPVC Pipes for hot water.
- UPVC and CPVC fittings for all the above items.



GM pipes & fittings

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QUALITY ASSURANCE

This is our long-term commitment to the customers. From the receipt of the bulk resins to the final stages of production, **GM** maintains stringent Quality Control programme by qualified technical personnel using sophisticated procedures, with latest equipment. Both on - line Q.C. Checks and in-lab tests are conducted.

GM subjects its full line of pipes and fittings to hydrostatic pressure test as per the design data, to check the suitability of the product to the application.

GM laboratory is well facilitated to conform that the products manufactured are to standard specifications.

GM high performance extruders with advanced process control and monitoring system permit increased rate of production over the entire diameter ranges, adhering to the highest quality.

GM high technology moulding machines with advanced automated tooling permit high volume production of fittings with exceptionally high consistency in terms of dimensional accuracy, mechanical strength and surface finish.

GM sophisticated quality control procedures and advanced manufacturing techniques work hand-in-hand to assure the highest quality and dimensional consistency in thermoplastic piping products.

QUALITY TEST FOR PIPES IN **GM** LABS :-

- Methylene Chloride, And Aceton Test.
- Heat Reversion Test.
- Impact Test.
- Water Absorption Test.
- Hydrostatic Pressure Test.
- Compression Test.
- Tensile strength Test.
- Dimension Measurements.
- Visual Inspection.
- Parallel Plates Test.
- Specific Gravity Test.
- Bending Test.
- Pendulum Test.
- Hardness Test.
- Stiffness Test.





GM UPVC MATERIAL PROPERTIES

MATERIAL :		
Unplasticized Polyvinyl Chloride (UPVC)		
GENERAL PROPERTIES :		
• Specific Gravity	1.38 - 1.42	gm / cm ³
• Water absorption	< 4	gm / cm ²
• Oxygen Index	45	
• Flammability	Self Extinguishing	
• Oxygen Penetration	< 1	cm ³ / m.day.bar
THERMAL PROPERTIES :		
• Heat Distortion Temperature @ 4.64 Kgf / cm ²	70 - 80	°C
Heat Distortion Temperature @ 18.56 Kgf / cm ²	70 - 73	°C
• Max. Operating Temperature	60	°C
• Specific Heat	0.20 - 0.28	cal / g.°C
• Thermal Conductivity	0.12 - 0.14	Kcal / m.h.°C
• Coefficient Of Linear Expansion	6.7x10 ⁻⁵ - 7.9x10 ⁻⁵	cm / cm.°C
MECHANICAL PROPERTIES :		
• Tensile Strength @ 73 °F	480 - 525	kgf / cm ²
• Compressive Strength @ 73 °F	655 - 675	kgf / cm ²
• Flexural Strength @ 73 °F	880 - 950	kgf / cm ²
• Impact Strength	4 - 4.5	joules
• Modulus Of Elasticity @ 73 °F	2.9 x 10 ⁴ - 3.16 x 10 ⁴	kgf / cm ²
• Relative Hardness (Rockwell)	110 - 120	R
ELECTRICAL PROPERTIES :		
• Volume Resistivity	> 1 x 10 ¹⁴	ohm / cm
• Surface Resistivity	> 1 x 10 ¹²	ohm / cm
• Power Factor (At 10 Cycles)	3.0	
• UPVC is a non conductor of electricity and also non subject to galvanic or electrolytic attack. Electrical equipments should not be earthened to (UPVC) pipes.		
COLOUR		
Gray and White (Other colours available on request)		





GM CPVC MATERIAL PROPERTIES

MATERIAL :		
Chlorinated Polyvinyl Chloride (CPVC)		
GENERAL PROPERTIES :		
• Specific Gravity	1.52 - 1.55	gm / cm ³
• Water absorption	< 7	gm / cm ² @ 73 °F
	5	gm / cm ² @ 212 °F
• Oxygen Index	60	
• Flammability	Self Extinguishing	
• Oxygen Penetration	< 1	cm ³ /m.day.bar
THERMAL PROPERTIES :		
• Heat Distortion Temperature @ 4.64 Kgf / cm ³	110 - 117	°C
• Heat Distortion Temperature @ 18.56 Kgf / cm ³	100 - 103	°C
• Max. Operating Temperature	93	°C
• Specific Heat	0.2 - 0.28	cal / g.°C
• Thermal Conductivity	0.1 - 0.13	Kcal / m.h.°C
• Coefficient Of Linear Expansion	8.3x10 ⁻⁵ - 8.9x10 ⁻⁵	cm/cm.°C
MECHANICAL PROPERTIES :		
• Tensile Strength @ 73 °F	550-580	kgf/ cm ²
• Compressive Strength @ 73 °F	690 - 720	kgf/ cm ²
• Flexural Strength @ 73 °F	1010 - 1080	kgf/ cm ²
• Impact Strength	4 - 4.5	joules
• Modulus Of Elasticity @ 73 °F	2.53 x 10 ⁴ - 2.82 x 10 ⁴	kgf / cm ²
• Relative Hardness (Rockwell)	117 - 119	R
ELECTRICAL PROPERTIES :		
• Volume Resistivity	> 1 x 10 ¹⁴	ohm / cm
• Surface Resistance	> 1 x 10 ¹²	ohm / cm
• Power Factor (At 10 Cycles)	3.0	
• CPVC is a non conductor of electricity and also non subject to galvanic or electrolytic attack. Electrical equipments should not be earthened to (CPVC) pipes.		
COLOUR		
Light Gray		





ADVANTAGES OF GM PIPES

Flexibility

GM UPVC & CPVC pipes are regarded as flexible when properly installed in a trench using suitable bedding and backfill, and have enough flexibility to withstand reasonable displacement in the pipeline without fracture or great deformation. Also, they have a sufficient resistance to bending which may arise from the movement of un-rigid soils. This property will cause ease in installation and needn't of building concrete foundations to prevent breakage.

Light Weight

GM UPVC & CPVC pipes are incredibly lighter than traditional pipes either used in water supply or sewer system. The specific weight of the PVC pipes is less than 1/5 that of C.I. pipes and 1/10 that of concrete pipes. This gives a great saving in transportation, manpower handling and installation costs.

Mechanical Strength

GM UPVC & CPVC pipes have great modulus of elasticity, tensile strength compressive strength and relative hardness compared with other polyolefines systems and than they have more ability to withstand loads and lower tendency to flatten under pressure.

GM UPVC & CPVC pipes have a great ability to withstand external static loads yield from soil layers and mechanical loads.

Also for their higher mechanical strengths, **GM** UPVC & CPVC pipes can withstand the same working pressures with lower wall thickness than other polyolefines pipes for the same size, yielding in larger inside diameter and hence lower pressure drop and lower energy loss specially for long systems.

Impact Strength

GM UPVC & CPVC pipes have great impact strength than corresponding cast iron or clay pipes, which cuts losses arises from the breakage due to mishandling during transportation, installation etc....

Non Toxic

GM UPVC & CPVC pipes are produced from non-toxic materials, which guarantee its use in drinking water without harmness. Also, **GM** UPVC & CPVC pipes will not impair the taste, smell or color of water or any other liquid and don't permit the growth of Bacteria or Parasites. which may grow in polyolefines systems due to the lower value of Oxygen penetration of **GM** pipes compared with polyolefines.

Fire proofness

GM UPVC & CPVC pipes will not support combustion, and flames are unable to spread and travel through them according to their high Oxygen index value which is a great advantage when compared with other polyolefines. And hence our pipes are categorized as fire retardant or self extinguishing, specially for the CPVC which approved to be used in the fire fighting and sprinkler systems.



Corrosion Resistance

GM UPVC & CPVC pipes have a high corrosion resistance against chemicals like acids, alkalies, oils, salts, etc.... So it is particularly reliable for transporting chemical solutions, gases, and other corrosive materials and can handle a wide range of industrial effluents. Also, **GM** UPVC & CPVC pipes don't undergo physical deterioration due to corrosive subsoils.

In fact this is a very useful property which makes a great reduction in the chemical protection costs necessary for the other types of pipes when used with aggressive materials. Also the low value of Oxygen penetration of **GM** pipes protects the metal parts associated with the system " for example the Brass Insert fittings".

Also **GM** UPVC & CPVC systems have the advantage of withstand the chlorine and its compounds as well as the ozone and additives used to protect potable water from bacteria and parasites.

Dielectric Properties

GM UPVC & CPVC pipes are completely efficient electrical insulators and non subject to galvanic or electrolytic attack which usually destroys under ground metal piping. PVC pipes are suitable as an electric conduit.

Thermal Insulation

GM UPVC & CPVC pipes have a low thermal conductivity and hence higher thermal insulation than other piping systems " copper, galvanized and stainless steel and polyolefines" therefore **GM** pipes are more suitable for transporting hot and cold fluids in various systems as well as hot potable water for domestic use with lower heat loss and then higher energy savings than other systems.

Also **GM** UPVC & CPVC pipes incredibly reduce the cost of using insulation materials when it is necessary to use specially in heating and cooling systems.

Low Friction loss

GM UPVC & CPVC pipes have a very smooth surface and very low surface roughness, which result in a low friction and flow loss. **GM** UPVC & CPVC pipes also impedes the build-up of deposits and scales due to long service. Therefore our pipes yield to low pressure loss, and hence energy saving.

Installation

Installation and maintenance of **GM** UPVC & CPVC networks are quick and easy due to lightweight, flexibility, easy joints, high quality and effectively tightened cemented and rubber joint sockets and no need of special tools or skilled personnel.

GM UPVC & CPVC pipes are easier to install than the traditional one and then the overall operation cost (transportation, handling, human effort, time of installation...etc.) is very low in comparison with other pipes even if we don't include the losses due to breakage in other types.





TECHNICAL SERVICE

GULF MANUFACTURES, GM Has technical service department, staffed by qualified engineers, who provide a free technical advisory service to civil engineers, contractors, etc..., including advice on the properties of UPVC and CPVC, the suitability of the material for specific application, the design of pipe lines and the installation of PVC pipes . That service also provides site demonstrations and training of Technitions, unfamiliar with the handling and joining of PVC pipes and fittings.

Direct substitution of UPVC and CPVC pipes for traditional pipes, without an informed appraisal of the most efficient methods of using them, can never show their full economies. The many advantages and economies possible are best achieved only where UPVC and CPVC are used correctly.

This is the reason of our great conviction of the introduction of our technical support to all under concern.



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APPLICATION STANDARDS

SCHEDULE 40 (UPVC)	SCHEDULE 80 (UPVC)
ASTM D-1784 for rigid UPVC compound ASTM D-1785 for UPVC pipes (size & pressure) ASTM D-2466 for UPVC fittings	ASTM D-1784 for rigid UPVC compound ASTM D-1785 for UPVC pipes (size & pressure) ASTM D-2464 for threaded UPVC fittings ASTM D-2467 for the socket UPVC fittings
Drain Waste & Vent "DWV" (UPVC)	SCHEDULE 80 (CPVC)
ASTM D-2665 for UPVC pipes ASTM D-3034 for UPVC fittings ASTM D-3311 for UPVC fittings	ASTM D-1784 for rigid CPVC compound ASTM F-441 for CPVC pipes(size & pressure) ASTM F-437 for threaded CPVC fittings ASTM F-439 for the socket CPVC fittings
UPVC PIPES SDR SERIES	
ASTM D-2241	

GM UPVC Pipes and Fittings for water supply, drainage, soil waste, sewer, ventilation system, air conditioning and chilled water systems and fire fighting water supply are manufactured to inch dimensions from 1/2 inch to 8 inches. (largest sizes can be produced).

GM UPVC pipes are produced according to ASTM D-1785 specifications Schedule 40 & 80. These pipes are normally available in standard lengths of 6 meters. Other lengths can be manufactured and pipes are available with plain end and solvent joint sockets. Pipes are made with colour for Schedule 40 and grey colour for Schedule 80.

GM UPVC Pipes SDR Series are manufactured to inch dimensions from 1/2 inch to 8 inches.

GM UPVC pipes SDR Series are produced according to ASTM D-2241 specifications. These pipes are normally available in standard lengths of 6 meters. Other lengths can be manufactured and pipes are available with plain ends and solvent joint sockets. Pipes are made with white colour.

GM CPVC Pipes for HOT LIQUIDS suitable for all the above application with higher working temperatures as well as they qualification in fire fighting and sprinkler systems are manufactured in inch dimensions from 1/2 inch to 2 inch. (biggest sizes are available on request)

GM CPVC Pipes, are produced according to ASTM F-441/ F441M specification, schedule 80. These pipes are normally available in standard lengths of 6 meters. Other lengths can be made available in plain spigot pipes produced in light grey colour.

GM also produces the fittings for the above pipes according to ASTM D-2466 for UPVC fittings schedule 40, ASTM D-2464, D-2467 for UPVC fittings schedule 80, ASTM D-3033, D-3034, D-3311 for UPVC fittings DWV & Sewer applications and ASTM F-437, F-439 for CPVC fittings schedule 80.

CPVC pipes and fittings Schedule 40 and SDR series could be available upon request.





GM UPVC PIPES ACC. TO ASTM D-1785 SCH. 40



GM Pipes With Plain End



GM Pipes With One Solvent Socket

Nominal Size (Inch)	Outside Diameter (D) (mm)		Wall Thickness (S) (mm)		Min. Socket Depth (C) (mm)	Pressure Rating bar
	Min.	Max.	Min.	Max.		
1/2	21.24	21.43	2.77	3.27	25.40	41.4
3/4	26.57	26.77	2.88	3.37	31.75	33.1
1	33.28	33.52	3.38	3.88	38.10	31.0
1 1/4	42.04	42.29	3.56	4.06	44.45	25.5
1 1/2	48.11	48.41	3.69	4.19	50.80	22.8
2	60.18	60.47	3.92	4.41	57.15	19.3
2 1/2	72.85	73.20	5.16	5.76	63.50	20.7
3	88.70	89.10	5.49	6.14	82.55	17.9
4	114.08	114.52	6.02	6.73	101.60	15.2
5	141.05	141.55	6.56	7.34	101.60	13.1
6	168.00	168.55	7.12	7.97	152.40	12.4
8	218.70	219.45	8.18	9.16	152.40	11.0

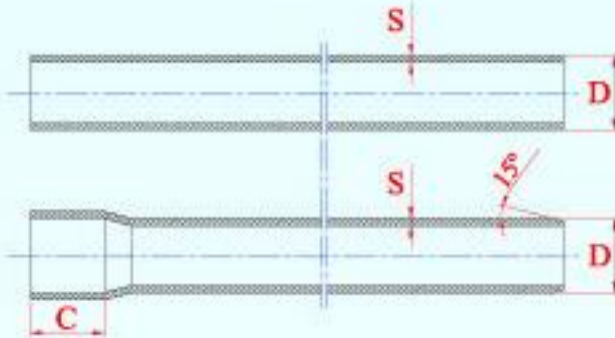
- Dimensions of the pipe bell socket meet ASTM D-2672.
- Pressure ratings are applied only to unthreaded pipes at 73° F.
- pipes have white colour.



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GM UPVC PIPES ACC. TO ASTM D-2241 SDR SERIES



GM Pipes With Plain End

GM Pipes With One Solvent Socket

SDR 13.5 (21.7 bar)

Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min. Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	21.24	21.43	1.58	2.08	25.40
3/4	26.57	26.77	1.99	2.48	31.75
1	33.28	33.52	2.47	2.97	38.10
1 1/4	42.04	42.29	3.13	3.63	44.45
1 1/2	48.11	48.41	3.59	4.08	50.80
2	60.18	60.47	4.48	4.97	57.15
2 1/2	72.85	73.20	5.42	6.07	63.50
3	88.70	89.10	6.58	7.36	82.55
4	114.08	114.52	8.46	9.47	101.60
5	141.05	141.55	10.47	11.70	101.60
6	168.00	168.55	12.48	13.97	152.40
8	-	-	-	-	-

SDR 17 (17.2 bar)

Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min. Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	-	-	-	-	-
3/4	26.57	26.77	1.58	2.08	31.75
1	33.28	33.52	1.96	2.46	38.10
1 1/4	42.04	42.29	2.49	2.99	44.45
1 1/2	48.11	48.41	2.85	3.35	50.80
2	60.18	60.47	3.56	4.06	57.15
2 1/2	72.85	73.20	4.30	4.80	63.50
3	88.70	89.10	5.24	5.86	82.55
4	114.08	114.52	6.74	7.54	101.60
5	141.05	141.55	8.31	9.29	101.60
6	168.00	168.55	9.91	11.09	152.40
8	218.70	219.45	12.91	14.45	152.40

SDR 21 (13.8 bar)

Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	-	-	-	-	-
3/4	26.57	26.77	1.53	2.03	31.75
1	33.28	33.52	1.60	2.10	38.10
1 1/4	42.04	42.29	2.01	2.51	44.45
1 1/2	48.11	48.41	2.29	2.79	50.80
2	60.18	60.47	2.88	3.37	57.15
2 1/2	72.85	73.20	3.48	3.98	63.50
3	88.70	89.10	4.25	4.74	82.55
4	114.08	114.52	5.44	6.09	101.60
5	141.05	141.55	6.74	7.54	101.60
6	168.00	168.55	8.03	8.99	152.40
8	218.70	219.45	10.42	11.65	152.40

SDR 26 (11.0 bar)

Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min. Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	-	-	-	-	-
3/4	-	-	-	-	-
1	33.28	33.52	1.53	2.03	38.10
1 1/4	42.04	42.29	1.63	2.13	44.45
1 1/2	48.11	48.41	1.86	2.36	50.80
2	60.18	60.47	2.32	2.81	57.15
2 1/2	72.85	73.20	2.80	3.30	63.50
3	88.70	89.10	3.43	3.93	82.55
4	114.08	114.52	4.40	4.90	101.60
5	141.05	141.55	5.44	6.12	101.60
6	168.00	168.55	6.48	7.26	152.40
8	218.70	219.45	8.44	9.44	152.40



SDR 32.5 (8.6 bar)

Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min. Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	-	-	-	-	-
3/4	-	-	-	-	-
1	-	-	-	-	-
1 1/4	42.04	42.29	1.53	2.03	44.45
1 1/2	48.11	48.41	1.53	2.03	50.80
2	60.18	60.47	1.86	2.36	57.15
2 1/2	72.85	73.20	2.24	2.74	63.50
3	88.70	89.10	2.75	3.25	82.55
4	114.08	114.52	3.51	4.01	101.60
5	141.05	141.55	4.35	4.87	101.60
6	168.00	168.55	5.19	5.79	152.40
8	218.70	219.45	6.74	7.54	152.40

SDR 41 (6.9 bar)

Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min. Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	-	-	-	-	-
3/4	-	-	-	-	-
1	-	-	-	-	-
1 1/4	-	-	-	-	-
1 1/2	-	-	-	-	-
2	-	-	-	-	-
2 1/2	-	-	-	-	-
3	88.70	89.10	2.16	2.66	82.55
4	114.08	114.52	2.80	3.30	101.60
5	141.05	141.55	3.46	3.96	101.60
6	168.00	168.55	4.12	4.62	152.40
8	218.70	219.45	5.34	5.96	152.40

SDR 64 (4.3 bar)

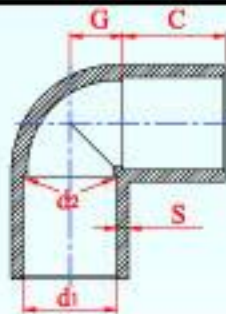
Nominal size (Inch)	Outside Diameter (D) (mm)		Wall thickness (S) (mm)		Min. Socket Depth (C) (mm)
	Min.	Max.	Min.	Max.	
1/2	-	-	-	-	-
3/4	-	-	-	-	-
1	-	-	-	-	-
1 1/4	-	-	-	-	-
1 1/2	-	-	-	-	-
2	-	-	-	-	-
2 1/2	-	-	-	-	-
3	-	-	-	-	-
4	114.08	114.52	1.78	2.28	101.60
5	141.05	141.55	2.21	2.71	101.60
6	168.00	168.55	2.65	3.14	152.40
8	218.70	219.45	3.43	3.93	152.40

- Dimensions of the pipe bell socket meet ASTM D-2672
- Pressure ratings are applied only to unthreaded pipes at 73° F.
- Pipes have white colour.





Elbow 90°



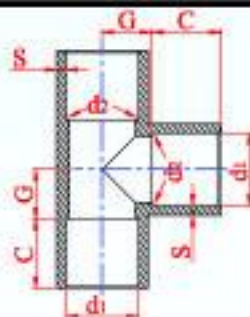
Size (Inch)	d1		d2		C	S	G
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	12.70
3/4	26.78	26.97	26.47	26.67	25.40	3.92	14.29
1	33.53	33.78	33.15	33.40	28.58	4.55	17.47
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	22.23
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	25.40
2	60.48	60.78	60.03	60.32	38.10	5.54	31.75

Elbow 45°



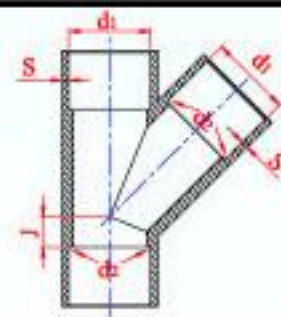
Size (Inch)	d1		d2		C	S	J
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	6.35
3/4	26.78	26.97	26.47	26.67	25.40	3.92	7.94
1	33.53	33.78	33.15	33.40	28.58	4.55	7.94
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	9.53
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	11.12
2	60.48	60.78	60.03	60.32	38.10	5.54	15.88

Branch eq 90°



Size (Inch)	d1		d2		C	S	G
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	12.70
3/4	26.78	26.97	26.47	26.67	25.40	3.92	14.29
1	33.53	33.78	33.15	33.40	28.58	4.55	17.47
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	22.23
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	25.40
2	60.48	60.78	60.03	60.32	38.10	5.54	31.75

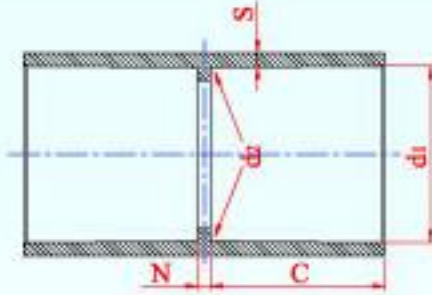
Branch eq 45°



Size (Inch)	d1		d2		C	S	J
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	6.35
3/4	26.78	26.97	26.47	26.67	25.40	3.92	7.94
1	33.53	33.78	33.15	33.40	28.58	4.55	7.94
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	9.53
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	11.12
2	60.48	60.78	60.03	60.32	38.10	5.54	15.88

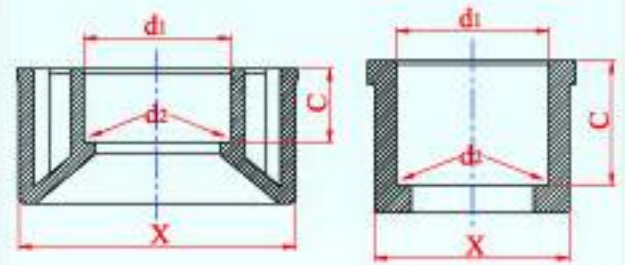


Coupling



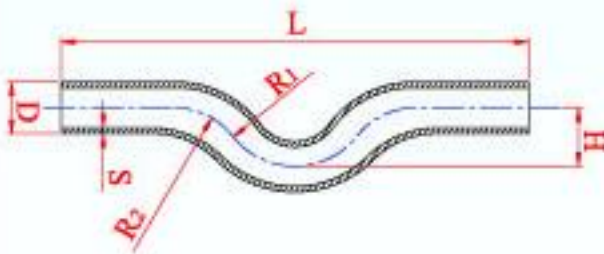
Size (Inch)	d ₁		d ₂		C	S	N
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	17.48	2.77	2.39
3/4	26.78	26.97	26.47	26.67	18.27	2.87	2.39
1	33.53	33.78	33.15	33.40	22.23	3.38	2.39
1 1/4	42.30	42.54	41.91	42.16	23.83	3.56	2.39
1 1/2	48.42	48.71	47.96	48.26	27.79	3.69	2.39
2	60.48	60.78	60.03	60.32	29.37	3.92	2.39

Reducer Bush



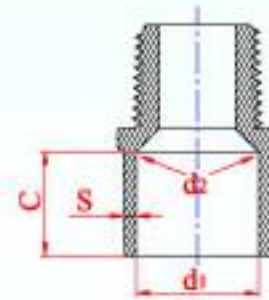
Size (Inch)	d ₁		d ₂		C	X	
	min.	max.	min.	max.		min.	max.
1 / 1/2	21.44	21.64	21.14	21.33	17.48	33.28	33.52
1 / 3/4	26.78	26.97	26.47	26.67	18.27	33.28	33.52
1 1/2 / 1	33.53	33.78	33.15	33.40	22.23	48.11	48.41
1 1/2 / 1 1/4	42.30	42.54	41.91	42.16	23.83	48.11	48.41
2 / 1	33.53	33.78	33.15	33.40	22.23	60.18	60.47
2 / 1 1/2	48.42	48.71	47.96	48.26	27.79	60.18	60.47

Cross-Over



Size (Inch)	D		S	L		H	R ₁	R ₂
	min.	max.		min.	max.			
1/2	21.24	21.43	3.74	203.20	25.20	35.00	32.00	
3/4	26.57	26.77	3.92	203.20	30.90	41.00	37.70	

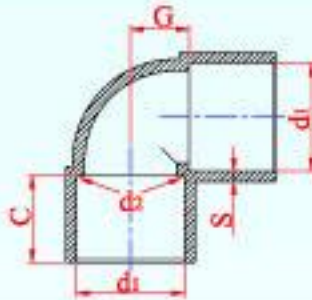
Male Threaded Adapter



Size (Inch)	d ₁		d ₂		C	S	N
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	17.48	2.77	14
3/4	26.78	26.97	26.47	26.67	18.27	2.87	14
1	33.53	33.78	33.15	33.40	22.23	3.38	11.5
1 1/4	42.30	42.54	41.91	42.16	23.83	3.56	11.5
1 1/2	48.42	48.71	47.96	48.26	27.79	3.69	11.5
2	60.48	60.78	60.03	60.32	29.37	3.92	11.5

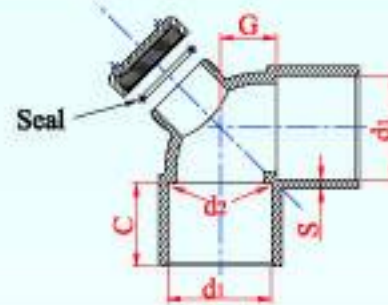


Elbow 90°



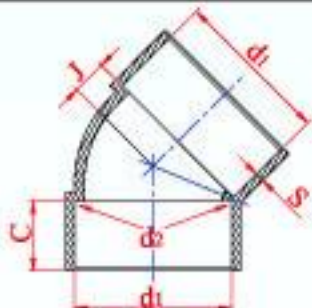
Size (Inch)	d ₁		d ₂		C	S	G
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04
4	114.69	115.06	113.92	114.30	44.45	6.35	58.74
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90

Elbow 90° With Access Cap



Size (Inch)	d ₁		d ₂		C	S	G
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04
4	114.69	115.06	113.92	114.30	44.45	6.35	58.74
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90

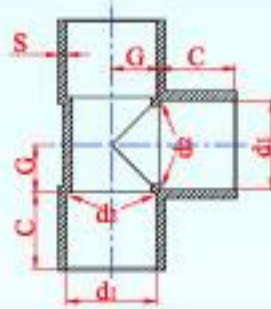
Elbow 45°



Size (Inch)	d ₁		d ₂		C	S	J
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	19.05
4	114.69	115.06	113.92	114.30	44.45	6.35	25.40
6	168.58	169.21	167.75	168.24	76.20	7.14	44.45

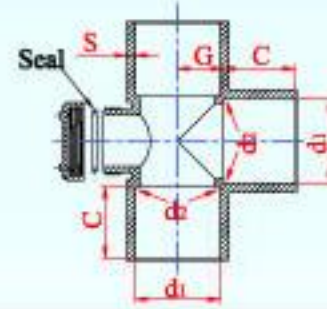


Branch eq. 90°



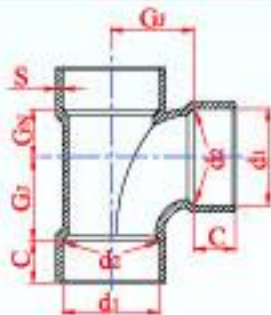
Size Inch	d ₁		d ₂		C	S	G
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04
4	114.69	115.06	113.92	114.30	44.45	6.35	58.74
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90

Branch eq. 90° With Access Cap



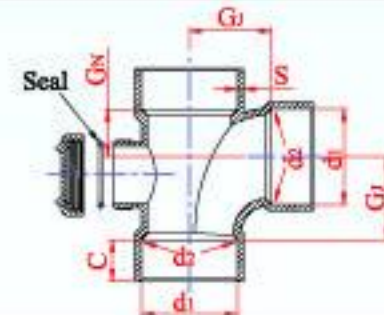
Size Inch	d ₁		d ₂		C	S	G
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04
4	114.69	115.06	113.92	114.30	44.45	6.35	58.74
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90

Sanitary Branch eq. 90°



Size (Inch)	d ₁		d ₂		C	S	GN	GJ
	min.	max.	min.	max.				
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04	77.79
4	114.69	115.06	113.92	114.30	44.45	6.35	57.15	98.43
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90	127.00

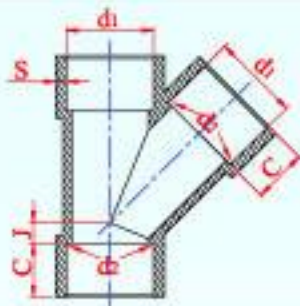
Sanitary Branch eq. 90° With Access Cap



Size (Inch)	d ₁		d ₂		C	S	GN	GJ
	min.	max.	min.	max.				
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04	77.79
4	114.69	115.06	113.92	114.30	44.45	6.35	57.15	98.43
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90	127.00

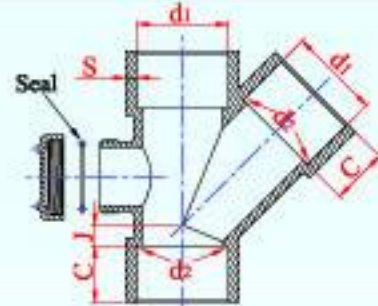


Branch eq. 45°



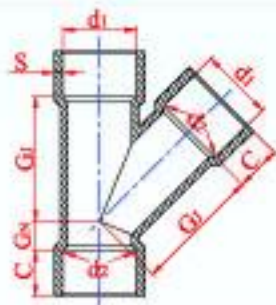
Size (Inch)	d1		d2		C	S	J
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	19.05
4	114.69	115.06	113.92	114.30	44.45	6.35	25.40
6	168.58	169.21	167.75	168.24	76.20	7.14	44.45

Branch eq. 45° With Access Cap



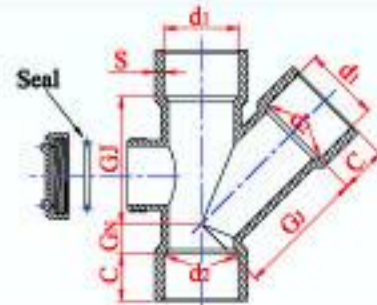
Size (Inch)	d1		d2		C	S	J
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	19.05
4	114.69	115.06	113.92	114.30	44.45	6.35	25.40
6	168.58	169.21	167.75	168.24	76.20	7.14	44.45

Sanitary Branch eq. 45°



Size (Inch)	d1		d2		C	S	GN	GJ
	min.	max.	min.	max.				
3	89.29	89.66	88.52	88.90	38.10	5.57	41.28	127.00
4	114.69	115.06	113.92	114.30	44.45	6.35	47.63	161.93
6	168.58	169.21	167.75	168.24	76.20	7.14	44.45	214.32

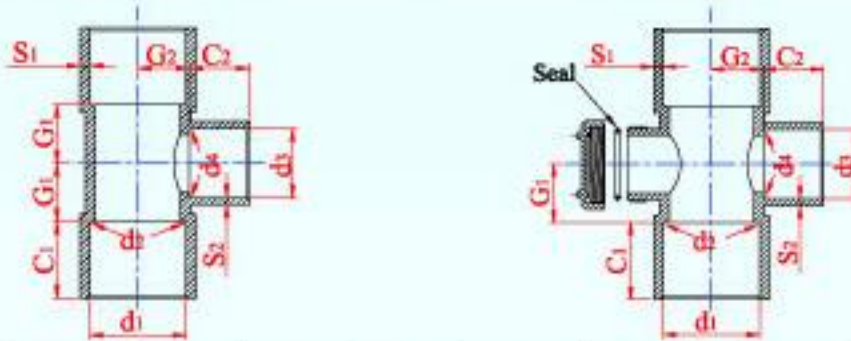
Sanitary Branch eq. 45° With Access Cap



Size (Inch)	d1		d2		C	S	GN	GJ
	min.	max.	min.	max.				
3	89.29	89.66	88.52	88.90	38.10	5.57	41.28	127.00
4	114.69	115.06	113.92	114.30	44.45	6.35	47.63	161.93
6	168.58	169.21	167.75	168.24	76.20	7.14	44.45	214.32

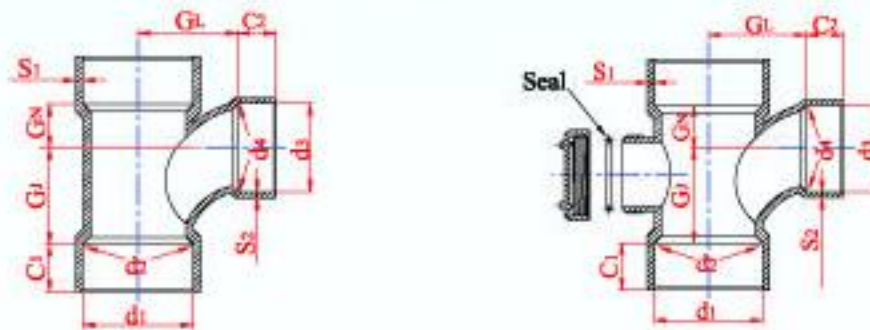


Reducer Branch 90° / Reducer Branch 90° With Access Cap



Size (Inch)	d1		d2		C1	S1	G1	d3		d4		C2	S2	G2
	min.	max.	min.	max.				min.	max.	min.	max.			
3 / 2	89.29	89.66	88.52	88.90	38.10	5.57	46.04	60.58	60.96	60.08	60.32	19.05	3.97	31.75
4 / 2	114.69	115.06	113.92	114.30	44.45	6.35	58.74	60.58	60.96	60.08	60.32	19.05	3.97	31.75
4 / 3	114.69	115.06	113.92	114.30	44.45	6.35	58.74	89.29	89.66	88.52	88.90	38.10	5.57	46.04
6 / 4	168.58	169.21	167.75	168.24	76.20	7.14	88.90	114.69	115.06	113.92	114.30	44.45	6.35	58.74

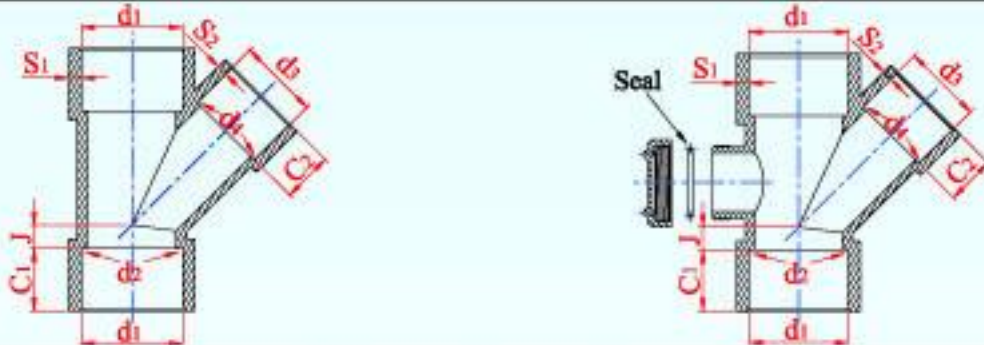
Sanitary Reducer Branch 90° / Sanitary Reducer Branch 90° With Access Cap



Size (Inch)	d1		d2		C1	S1	G1	GN	d3		d4		C2	S2	GL
	min.	max.	min.	max.					min.	max.	min.	max.			
3 / 2	89.29	89.66	88.52	88.90	38.10	5.57	53.98	30.17	60.58	60.96	60.08	60.32	19.05	3.97	73.03
4 / 2	114.69	115.06	113.92	114.30	44.45	6.35	52.39	28.58	60.58	60.96	60.08	60.32	19.05	3.97	84.14
4 / 3	114.69	115.06	113.92	114.30	44.45	6.35	76.20	44.45	89.29	89.66	88.52	88.90	38.10	5.57	90.49
6 / 4	168.58	169.21	167.75	168.24	76.20	7.14	92.08	55.57	114.69	115.06	113.92	114.30	44.45	6.35	109.54

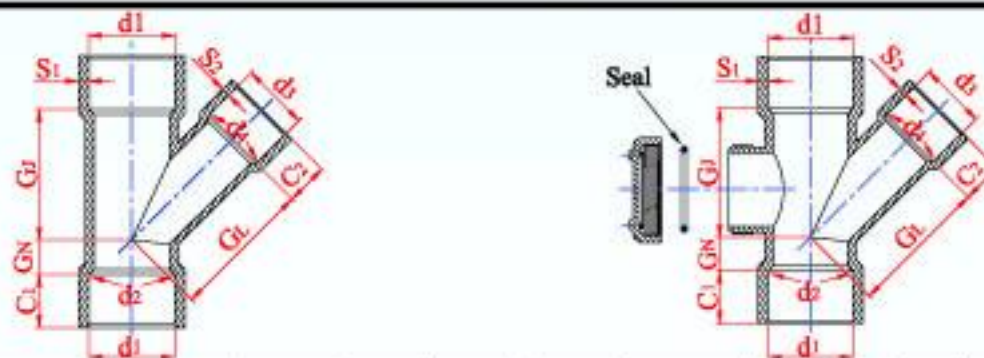


Reducer Branch 45° / Reducer Branch 45° With Access Cap



Size (Inch)	d ₁		d ₂		C ₁ min.	S ₁ min.	d ₃		d ₄		C ₂ min.	S ₂ min.	J min.
	min.	max.	min.	max.			min.	max.	min.	max.			
3 / 2	89.29	89.66	88.52	88.90	38.10	5.57	60.58	60.96	60.08	60.32	19.05	3.97	19.05
4 / 2	114.69	115.06	113.92	114.30	44.45	6.35	60.58	60.96	60.08	60.32	19.05	3.97	25.40
4 / 3	114.69	115.06	113.92	114.30	44.45	6.35	89.29	89.66	88.52	88.90	38.10	5.57	25.40
6 / 4	168.58	169.21	167.75	168.24	76.20	7.14	114.69	115.06	113.92	114.30	44.45	6.35	44.45

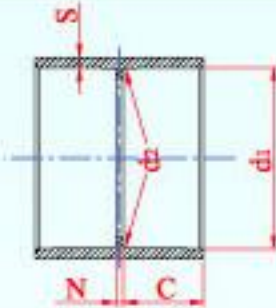
Sanitary Reducer Branch 45° / Sanitary Reducer Branch 45° With Access Cap



Size Inch	d ₁		d ₂		C ₁ min.	S ₁ min.	G _J min.	G _N min.	d ₃		d ₄		C ₂ min.	S ₂ min.	G _L min.
	min.	max.	min.	max.					min.	max.	min.	max.			
3 / 2	89.29	89.66	88.52	88.90	38.10	5.57	104.78	22.23	60.58	60.96	60.08	60.32	19.05	3.97	117.48
4 / 2	114.69	115.06	113.92	114.30	44.45	6.35	119.07	9.53	60.58	60.96	60.08	60.32	19.05	3.97	141.29
4 / 3	114.69	115.06	113.92	114.30	44.45	6.35	141.29	26.99	89.29	89.66	88.52	88.90	38.10	5.57	152.4
6 / 4	168.58	169.21	167.75	168.24	76.20	7.14	169.87	4.77	114.69	115.06	113.92	114.30	44.45	6.35	188.92

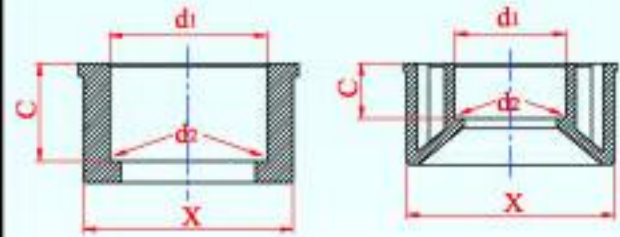


Coupling



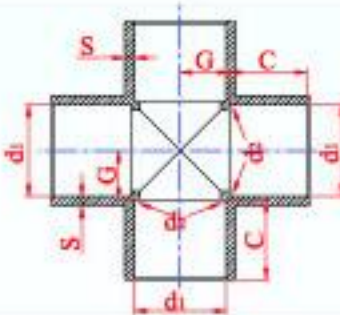
Size (Inch)	d ₁		d ₂		C	S	N
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	4.77
4	114.69	115.06	113.92	114.30	44.45	6.35	4.77
6	168.58	169.21	167.75	168.24	76.20	7.14	6.35

Reducer Bush



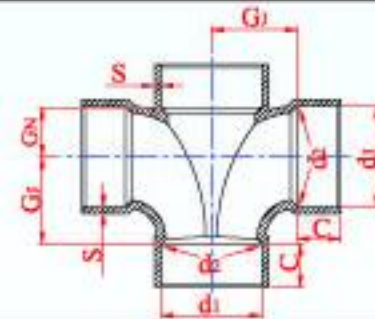
Size (Inch)	d ₁		d ₂		C	X	
	min.	max.	min.	max.		min.	max.
3 / 2	60.58	60.96	60.08	60.32	19.05	88.70	89.10
4 / 2	60.58	60.96	60.08	60.32	19.05	114.08	114.52
4 / 3	89.29	89.66	88.52	88.90	38.10	114.08	114.52
6 / 4	114.69	115.06	113.92	114.30	44.45	168.00	159.02

Cross eq. 90°



Size (Inch)	d ₁		d ₂		C	S	G
	min.	max.	min.	max.			
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04
4	114.69	115.06	113.92	114.30	44.45	6.35	58.74
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90

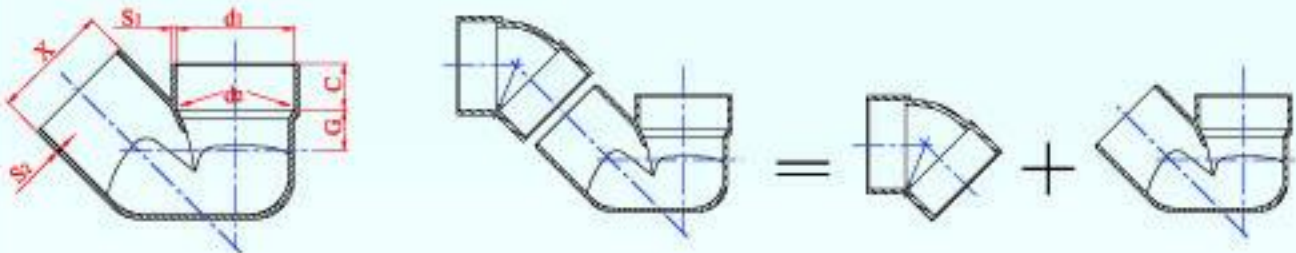
Sanitary Cross eq. 90°



Size (Inch)	d ₁		d ₂		C	S	GN	GJ
	min.	max.	min.	max.				
3	89.29	89.66	88.52	88.90	38.10	5.57	46.04	77.79
4	114.69	115.06	113.92	114.30	44.45	6.35	57.15	98.43
6	168.58	169.21	167.75	168.24	76.20	7.14	88.90	127.00

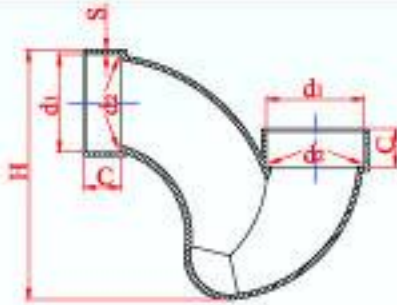


Syphon (Two pieces)



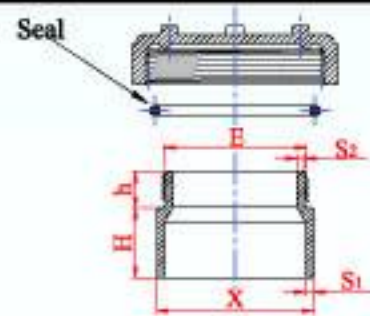
Size (Inch)	d1		d2		X		C min.	S1 min.	S2 min.	G min.
	min.	max.	min.	max.	min.	max.				
3	89.29	89.66	88.52	88.90	88.70	89.10	38.10	4.95	4.95	46.04
4	114.69	115.06	113.92	114.30	114.08	114.52	44.45	5.30	5.30	50.10

Connector Trap(One piece)



Size (Inch)	d1		d2		C min.	S min.	H min.
	min.	max.	min.	max.			
4	114.69	115.06	113.92	114.30	44.45	5.08	292.76

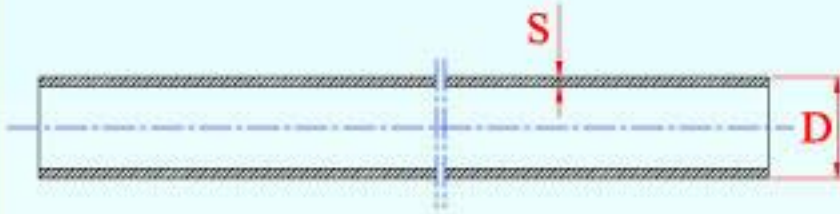
Cleaning Insert With Access Cap



Size (Inch)	X		E min.	S1 min.	S2 min.	H min.	h min.
	min.	max.					
4	114.08	114.52	104.14	5.59	5.59	50.80	26.67







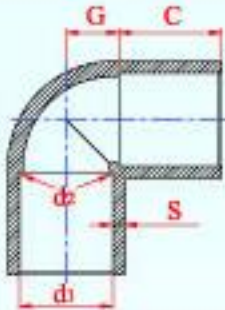
GM Pipes With Plain End

Nominal Size (Inch)	Outside Diameter (D) mm		Wall Thickness (S) mm		Pressure Rating bar	
	Min.	Max.	Min.	Max.	Unthreaded	Threaded
1/2	21.24	21.43	3.74	4.24	58.6	29.0
3/4	26.57	26.77	3.92	4.41	47.6	23.4
1	33.28	33.52	4.55	5.08	43.4	22.1
1 1/4	42.04	42.29	4.85	5.43	35.9	17.9
1 1/2	48.11	48.41	5.08	5.69	32.4	16.5
2	60.18	60.47	5.54	6.19	27.6	13.8
2 1/2	72.85	73.20	7.01	7.84	29.0	14.5
3	88.70	89.10	7.62	8.53	25.5	13.1
4	114.08	114.52	8.56	9.57	22.1	11.0
5	141.05	141.55	9.53	10.66	20.0	N.R.
6	168.00	168.55	10.98	12.29	19.3	N.R.
8	218.70	219.45	12.7	14.22	17.2	N.R.

- Dimensions of the pipe bell socket meet ASTM D2672
- Pressure ratings are applied to water service at 73° F.
- **GM** UPVC pipes have gray colour while CPVC pipes have light gray colour.



Elbow 90°



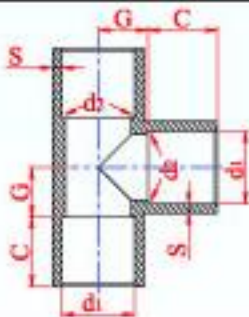
Size (Inch)	d1		d2		C	S	G
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	12.70
3/4	26.78	26.97	26.47	26.67	25.40	3.92	14.29
1	33.53	33.78	33.15	33.40	28.58	4.55	17.47
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	22.23
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	25.40
2	60.48	60.78	60.03	60.32	38.10	5.54	31.75

Elbow 45°



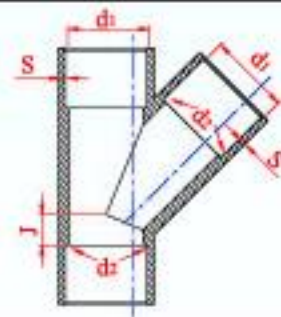
Size (Inch)	d1		d2		C	S	J
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	6.35
3/4	26.78	26.97	26.47	26.67	25.40	3.92	7.94
1	33.53	33.78	33.15	33.40	28.58	4.55	7.94
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	9.53
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	11.12
2	60.48	60.78	60.03	60.32	38.10	5.54	15.88

Branch eq. 90°



Size (Inch)	d1		d2		C	S	G
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	12.70
3/4	26.78	26.97	26.47	26.67	25.40	3.92	14.29
1	33.53	33.78	33.15	33.40	28.58	4.55	17.47
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	22.23
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	25.40
2	60.48	60.78	60.03	60.32	38.10	5.54	31.75

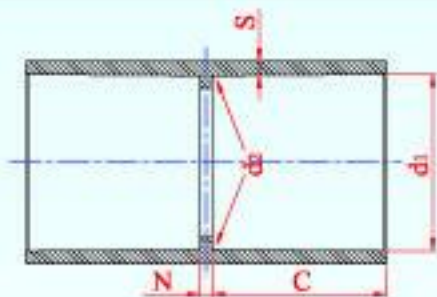
Branch eq. 45°



Size (Inch)	d1		d2		C	S	J
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	6.35
3/4	26.78	26.97	26.47	26.67	25.40	3.92	7.94
1	33.53	33.78	33.15	33.40	28.58	4.55	7.94
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	9.53
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	11.12
2	60.48	60.78	60.03	60.32	38.10	5.54	15.88

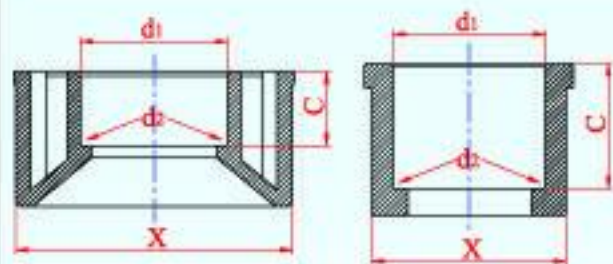


Coupling



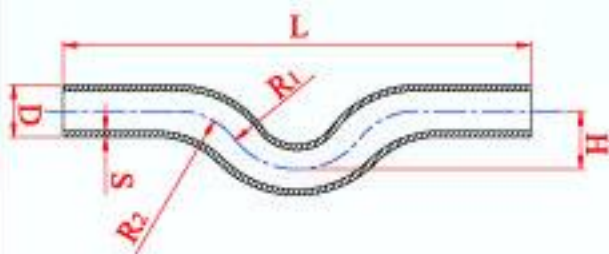
Size (Inch)	d ₁		d ₂		C	S	N
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	2.39
3/4	26.78	26.97	26.47	26.67	25.40	3.92	2.39
1	33.53	33.78	33.15	33.40	28.58	4.55	2.39
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	2.39
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	2.39
2	60.48	60.78	60.03	60.32	38.10	5.54	2.39

Reducer Bush



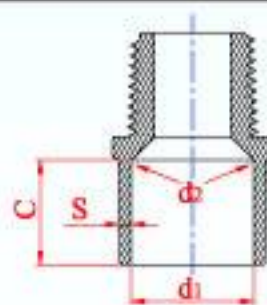
Size (Inch)	d ₁		d ₂		C	X	
	min.	max.	min.	max.		min.	max.
1/ 1/2	21.44	21.64	21.14	21.33	22.23	33.28	33.52
1/ 3/4	26.78	26.97	26.47	26.67	25.40	33.28	33.52
1 1/2 / 1	33.53	33.78	33.15	33.40	28.58	48.11	48.41
1 1/2 / 1 1/4	42.30	42.54	41.91	42.16	31.75	48.11	48.41
2 / 1	33.53	33.78	33.15	33.40	28.58	60.18	60.47
2 / 1 1/2	48.42	48.71	47.96	48.26	34.93	60.18	60.47

Cross-Over



Size (Inch)	D		S	L	H	R ₁	R ₂
	min.	max.					
1/2	21.24	21.43	2.77	203.20	25.20	35.00	32.00
3/4	26.57	26.77	2.87	203.20	30.50	41.00	37.70
1							
1 1/4							
1 1/2							
2							

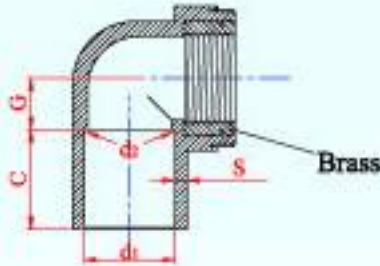
Male Threaded Adapter



Size (Inch)	d ₁		d ₂		C	S	N
	min.	max.	min.	max.			
1/2	21.44	21.64	21.14	21.33	22.23	3.74	14
3/4	26.78	26.97	26.47	26.67	25.40	3.92	14
1	33.53	33.78	33.15	33.40	28.58	4.55	11.5
1 1/4	42.30	42.54	41.91	42.16	31.75	4.86	11.5
1 1/2	48.42	48.71	47.96	48.26	34.93	5.08	11.5
2	60.48	60.78	60.03	60.32	38.10	5.54	11.5

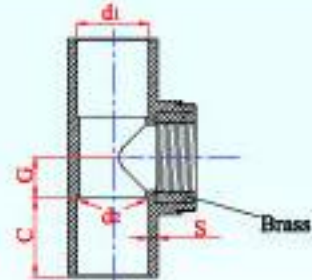


Elbow 90° Brass Insert



Size (Inch)	d1		d2		C	S	G	N
	min.	max.	min.	max.				
1/2 x 1/2	21.44	21.64	21.14	21.33	22.23	3.74	12.70	14
3/4 x 1/2	26.78	26.97	26.47	26.67	25.40	3.92	14.29	14

Branch 90° Brass Insert



Size (Inch)	d1		d2		C	S	G	N
	min.	max.	min.	max.				
1/2 x 1/2	21.44	21.64	21.14	21.33	22.23	3.74	12.70	14
3/4 x 1/2	26.78	26.97	26.47	26.67	25.40	3.92	14.29	14





GM pipes & fittings

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