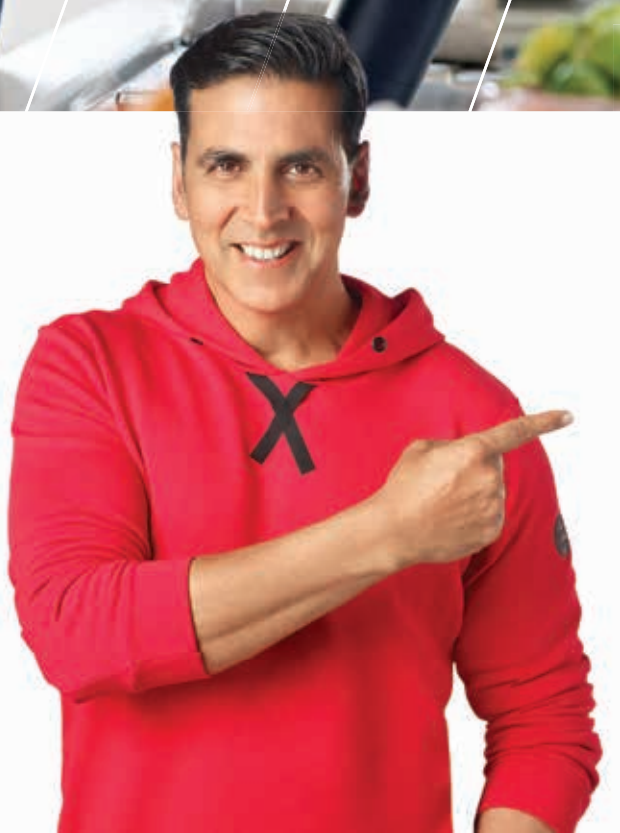
FORTUNE INDIA 500 COMPANY

PRINCE® PIPING SYSTEMS

KEEPS YOUR DRINKING WATER LEAD-FREE & YOU, TENSION-FREE.

TECHNICAL MANUAL



Pb LEAD-FREE

#Lead free pipes & fittings*

EASYFIT®

UPVC Plumbing Systems

PRINCE®

PIPING SYSTEMS

ZERO DEFECT CHOICE

PRINCE®
PIPING SYSTEMS

Greener Better Together

Prince Pipes is not about creating products that are different but providing solutions that make a difference. From our zero defect manufacturing process that involves using recycled plastic to designing and equipping our plants with solar panels and various other energy saving manufacturing techniques, our endeavor has always been to further bring down the emission levels. Our strong belief in the concept of "better lasts longer" has not only helped us deliver premium quality products but also ensure lesser consumption. Together with our channel partners and plumbers, we are sure to leave a strong legacy for the generations to come.

PRINCE®
PIPING SYSTEMS

THE JOURNEY

2021

• Manufacturing unit commissioned at Sangareddy, Telangana, to strengthen our strategic presence in Southern India
• Prince Pipes awarded "Brand of The Year - Pipes" at Realty + INEX Awards 2021

2020

• Prince Pipes Product collaborates with Lubrizol, the world's largest manufacturers and inventors of CPVC compounds
• Technical collaborates with Tooling Holland, a global leader in plastic moulds manufacturing

2019

• Manufacturing unit at Jobner, Rajasthan to cater to increasing volume demand
• Company successfully listed on BSE and NSE

2018

Prince Pipes announced bollywood actor Akshay Kumar as its brand ambassador.

2017

• Prince Pipes became a Public Limited Company.
• "Economic Times Polymers Award (Excellence in Plastics)" for excellence in building and construction (plumbing) in the large enterprises category

2016

Mr. Parag Chheda presented with the "Inspiring Business Leader Award" by Economic Times

2015

• Mr. Jayant Chheda received the "Lifetime Achievement Award" at Vinyl India Conference
• "IMEA Award" for the Haridwar factory by Frost & Sullivan

2014

Prince Pipes received "Asia's Most Promising Brand Award" by World Consulting and Research Corporation Delhi

2012

Prince Pipes acquired "Trubore"- a renowned brand of southern India from Chemplast Sanmar Group along with their two manufacturing units at Kolhapur & Chennai

2010

• Winner of "Best SME" at the Emerging India Awards 2010 by ICICI Bank, CNBC TV 18 & CRISIL
• Winner of "Outstanding Quality Contribution In Pipes Sector" by Bloomberg EPC world

2008

Manufacturing unit established at Haridwar (Uttarakhand) to cater to the increasing demand for Prince Pipes products

2005

Prince Pipes achieved the ₹100 Crore benchmark

2000

Manufacturing unit established at Dadra (Silvassa - D & N.H) to augment the pipe manufacturing capacity by setting up a new extrusion unit

1998

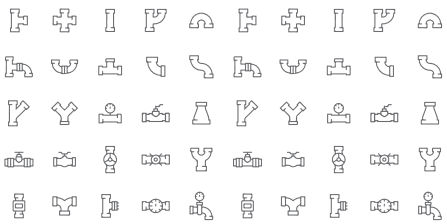
ISO Certification earned by ensuring compliance to every step of the quality management system

1995

Manufacturing unit established at Athal (Silvassa-D & N.H) to set-up a large scale Injection Moulding Unit which marked the beginning of Prince Pipes being one of the market leaders in PVC Fittings

1987

• Mr. Jayant Chheda commenced manufacturing unit of PVC Products
• 1st PVC Fittings Manufacturing Unit initiated to provide total piping solutions



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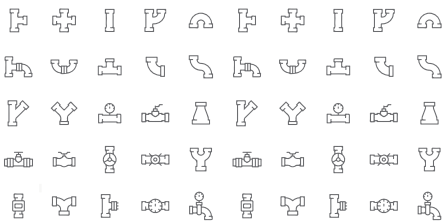

MANUFACTURING UNITS

SANGAREDDY EST. 2021

JAIPUR EST. 2019

KOLHAPUR EST. 2012

CHENNAI EST. 2012

HARIDWAR EST. 2008

DADRA EST. 2000

ATHAL EST. 1995

CERTIFICATIONS


Certificate

Standard: ISO 9001:2015
Certificate Registr. No.: 01 100 203[illegible]/03
Certificate Holder: PRINCE
PRINCE PIPES AND FITTINGS LTD
Survey no.1321/1/3 Athal Road,
Village Athal,Naroli, Silvassa- 396235,
Dadra & Nagar Haveli, India.
Scope: Manufacture of uPVC, CPVC and HDPE Fittings.
Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.
Validity: The certificate is valid from 2021-05-28 until 2024-05-27.
2021-05-28
TÜV Rheinland Cert GmbH
Am Grauen Stein 51105 Köln
IAF DAkkS
www.tuv.com
TÜVRheinland
Precisely Right.


Certificate

Standard: ISO 9001:2015
Certificate Registr. No.: 01 100 203[illegible]/01
Certificate Holder: PRINCE
PRINCE PIPES AND FITTINGS LTD
Khasara No.1548, 1549, / 4 & 5,
Salempur, [illegible] – 2, Haridwar -249402,
Uttarakhand, India.
Scope: Manufacture of uPVC, CPVC, PPR and HDPE Pipes and Fittings.
Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.
Validity: The certificate is valid from 2021-05-28 until 2024-05-27.
2021-05-28
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TÜVRheinland
Precisely Right.


Certificate

Standard: ISO 9001:2015
Certificate Registr. No.: 01 100 2030[illegible]34
Certificate Holder: PRINCE
PRINCE PIPES AND FITTINGS LTD
The Ruby, 8th floor, 29, Senapati Bapat Marg (Tulsi Pipe Road), Dadar - West, Mumbai 400028.
Maharashtra, India.
Scope: Design, Development, Marketing, Procurement, Purchase/CAPEX, H.R., Logistics Management and Corporate Support functions.
Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.
Validity: The certificate is valid from 2021-05-28 until 2024-05-27.
2021-05-28
TÜV Rheinland Cert GmbH
Am Grauen Stein 51105 Köln
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TÜVRheinland
Precisely Right.


Certificate

Standard: ISO 14001:2015
Certificate Registr. No.: 01 104 203[illegible]34
Certificate Holder: PRINCE
PRINCE PIPES AND FITTINGS LTD
The Ruby, 8th floor, 29, Senapati Bapat Marg (Tulsi Pipe Road), Dadar - West, Mumbai 400028, Maharashtra, India.
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Proof has been furnished by means of an audit that the requirements of ISO 14001:2015 are met.
Validity: The certificate is valid from 2021-05-28 until 2024-05-27.
2021-05-28
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IAF DAkkS
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Certificate

Standard: ISO 45001:2018
Certificate Registr. No.: 01 213 2036[illegible]34
Certificate Holder: PRINCE
PRINCE PIPES AND FITTINGS LTD
The Ruby, 8th floor, 29, Senapati Bapat Marg (Tulsi Pipe Road), Dadar - West, Mumbai 400028, Maharashtra, India.
Scope: Design, Development, Marketing, Procurement, Purchase/CAPEX, H.R., Logistics Management and Corporate Support functions.
Proof has been furnished by means of an audit that the requirements of ISO 45001:2018 are met.
Validity: The certificate is valid from 2021-05-28 until 2024-05-27.
2021-05-28
TÜV Rheinland Cert GmbH
Am Grauen Stein 51105 Köln
IAF DAkkS
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Precisely Right.


Certificate

Standard: ISO 50001:2018
Certificate Registr. No.: 01 407 1836340/01
Organization: Prince Pipes and Fittings Ltd.
Kasara No. 1548,1549/4 & 5, Salempur,Mehdood – 2, Industrial Park-2, Haridwar 249402
India
Site: PRINCE
PRINCE PIPES AND FITTINGS LTD.
The Ruby, 8th floor, 29, Senapati Bapat Marg,
(Tulsi Pipe Road), Dadar - West,
MUMBAI 400028. India
Scope: Design, Development, Marketing, Procurement, Purchase / CAPEX, H.R, Logistics Management and Corporate Support Functions.
Validity: Proof has been furnished by means of an audit that the requirements of ISO 50001:2018 are met.
The certificate is valid in conjunction with the main certificate 01 407 1836340 from 2021-05-21 until 2024-05-20.
2021-05-21
TÜV Rheinland Cert GmbH
Am Grauen Stein 51105 Köln
IAF DAkkS
www.tuv.com
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Precisely Right.

AWARDS

most preferred BUILDING MATERIAL COMPANY (PIPES & FITTINGS) 2022

inex INTERIOR & EXTERIOR AWARDS 2021 Realty+

REGARDING PVC MATERIAL

PVC pipes are commonly referred as uPVC pipes, indicating that they are un-plasticized because they do not contain any plasticizers. uPVC piping systems are commonly used in drinking water and waste water transport applications. The uPVC piping system is a modern alternative to traditional materials like metal piping system. Due to its versatility, cost effectiveness and excellent record of use over past five decades, it forms the most important component in the piping sector. This piping system has the following key advantages:

LIGHTWEIGHT:

uPVC is a lightweight material which minimizes labour and handling cost at site; thereby reducing installation cost.

STRENGTH:

uPVC has a good abrasion resistance; high tensile strength which provides long-term pressure bearing capacity.

DURABLE:

uPVC is resistant to weathering, corrosion, chemical rotting & shock.

EASY TO INSTALL & SIMPLE JOINTING METHOD:

uPVC can be cut & jointed easily with leak free solvent cement jointing method which results in faster installation.

COST-EFFECTIVE:

uPVC is popular for plumbing and piping applications; its physical and chemical properties provide excellent cost-performance advantages. As a material, uPVC is already priced competitively, and enjoys additional properties of durability, lifespan and hassle - free maintenance.

SAFE MATERIAL:

PVC is non-toxic material. Smooth internal surface of uPVC pipe & fittings is resistant to bacterial contamination and hence world rely on PVC piping system in order to keep free from contamination.

FIRE RESISTANT:

Like all other organic materials used in buildings, including other plastics, wood, textiles etc., PVC products will burn when exposed to a fire. PVC products however are self-extinguishing, i.e. if the ignition source is withdrawn, they will stop burning. Because of its high chlorine content, PVC products have fire safety characteristics, which are quite favorable as they are difficult to ignite, heat production is comparatively low and they tend to char instead of generating flaming droplets. LOI (Limiting Oxygen Index) of PVC is 45 which higher than any other plastic plumbing products.

LOW THERMAL CONDUCTIVITY:

uPVC has low thermal conductivity which results in low transfer of heat, thus saving energy.

SMOOTH SURFACES:

uPVC pipes and fittings have smooth internal and external surfaces which provide very nominal frictional loss by greatly reducing pumping cost.

PHYSICAL PROPERTIES OF PVC MATERIAL

Sl.No.	Property Description	Test Method	Unit	Value
GENERAL PROPERTIES				
1	Cell classification	ASTM D1784	-	12454
2	Max. usable temperature	-	°C	60
3	Specific Gravity	ASTM D 792	‘gm/cm3	1.43 +/- 0.02
4	Water absorption % increase at 24 hrs. & 25°C	ASTM D 570	%	0.05
5	Rockwell Hardness	ASTM D 785	-	110-120
6	William Hazen constant ©	-	-	150
7	Poisson ratio @ 23°C	ASTM D 638	-	0.38
MECHANICAL PROPERTIES				
1	Tensile strength @ 23°C	ASTM D 638	MPa	49
2	Tensile modulus of elasticity @ 23°C	ASTM D 638	MPa	2895
3	Flexural Strength @ 23°C	ASTM D 790	MPa	96.5
4	Compressive strength @ 23°C	ASTM D 695	MPa	66
5	Izod impact (notched) @ 23°C	ASTM D 256	Joule/meter	40
ELECTRICAL PROPERTIES				
1	Volume resistivity	ASTM D 257	Ohm/cm	1.2×10^{12}
2	Dielectric constant	ASTM D 150	-	3.2
3	Dielectric strength	ASTM D 149	Volt/mil	1.250
4	Electricity conductor	-	-	Non-conducting
THERMAL PROPERTIES				
1	Coefficient of linear thermal expansion	ASTM D 696	mm/m.°C	0.06
2	Thermal conductivity	ASTM C 177	Watt/m/°K	0.17
3	Heat deflection temperature	ASTM D 648	°C	77
4	Specific heat	ASTM D 2766	Joule/°K/gram	80
FIRE PROPERTIES				
1	Flammability rating	UL-94	-	V.0
2	Flame spread index	UL-94	-	< 5.0
3	Av. Extent of burning	ASTM D 635	mm	<10.0
4	Av. Time of burning	ASTM D 635	second	<5.0
5	LOI (Limiting oxygen index)	ASTM D 2863	LOI	45
6	Burning rate	ASTM D 635	‘mm/minute	Self-extinguishing

FEATURES AND BENEFITS

LEAD FREE EF PIPING SYSTEM: Prince EASYFIT piping systems are produced from new generation heat stabilizers, which are totally free from heavy metals, and complies to drinking water standards.

FREE FROM TOXICITY, ODORS AND TASTE: Prince Easyfit piping systems are non-toxic and do not impart fluid taste and odor.

EXCELLENT CHEMICAL AND CORROSION RESISTANCE: This system is free from corrosion and has excellent resistance to many chemicals, like strong mineral acids, alkalis, salts, and a host of organic solvents.

SIMPLE AND LEAK PROOF JOINTS: Jointing can be done speedily with the special solvent cement supplied by the company which ensures 100% leakproof joints.

OPTIMUM FLOW RATES: Mirror-smooth internal surface ensures high flow rates and low frictional losses.

MAINTENANCE FREE: Being Free from the problems of rusting, pitting or scaling, and galvanic or electrolytic corrosion, the Easyfit system is free from maintenance.

HOT & COLD: Proven performance for water temperature from 5°C to 60°C

STRONG, RESILIENT AND LONG LASTING: This system is highly resilient, tough and durable with high tensile and impact strength. Moreover, it is free from weaknesses caused by rusting, weathering and chemical action, and hence lasts for a lifetime.

MECHANICAL PROPERTIES: The PVC pipes are relatively more flexible. They have adequate tensile strength and even burst strength to withstand the operating pressures encountered in most service conditions, within the acceptable range of temperatures for the system.

LIGHT WEIGHT: Being light in weight (1/8th the weight of metal piping), these pipes are easy to handle, transport and install.

MOST SUITABLE FOR CARRYING DRINKING WATER: Being non-metallic, this system is free from corrosive chemical action and negative biological effects, hence it is safe for carrying potable water.

PIPING SYSTEM INTEGRITY: Easyfit offers pipes with a large range of fittings. This implies a complete system solution made of the same material.

COST EFFECTIVE: Due to light weight and simple joining technique, it saves cost not only on material but also on transportation and installation.

SELF-EXTINGUISHING: Does not support combustion

UV RESISTANT: Though PRINCE EASYFIT uPVC Piping system is UV resistant we recommend to apply paint wherever it is exposed to direct sunlight to avoid colour change of piping system.

LOW THERMAL CONDUCTIVITY: Low thermal conductivity is basic property of uPVC material which is much lower than metal piping system. This ensures very negligible temperature losses during long distance fluid transportation.

APPLICATIONS

Indoor and outdoor installations of cold water plumbing lines

RO and DM water plants

Public utilities & swimming pools

For concealed, downtake & terrace looping

Note:

1. Not for use with compressed air and gases.
2. Pressure rating of uPVC pipes & fittings is temperature related. Derating factor shall be applied during designing & operation for higher temperature application. For detailed data refer to IS 4985 or contact us.
3. Installation of uPVC pipelines shall be done in accordance with IS 7634 (Part - 3).
4. Flow velocity in the pipeline shall not be greater than 1.5 meter/sec.
5. For threaded pipes & fittings, the working pressure at 23°C shall be considered as 50% of rating.
6. Do not use uPVC pipes & fittings for hydro pneumatic applications.

STANDARDS FOR PIPES AND FITTINGS

Pipe			Fitting		
Size (mm)	Class	Standard	Size (mm)	Class	Standard
15 - 250 (1/2" - 10")	SCH 40	ASTM D - 1785	15 - 150 (1/2" - 6")	SCH 40	ASTM D 2466
15 - 250 (1/2" - 10")	SCH 80	ASTM D - 1785	15 - 100 (1/2" - 4")	SCH 80	ASTM D 2467

PIPES DIMENSION AND PRESSURE RATING

Dimension & Working pressure for Pipes (Solvent Weld) at 23° C

Nominal Bore		Outside Diameter	SCH 40			SCH 80		
(mm)	(inch)	(mm)	Wall Thickness (mm)	Working Pressure (kg/cm^2)	Burst Pressure (kg/cm^2)	Wall Thickness (mm)	Working Pressure (kg/cm^2)	Burst Pressure (kg/cm^2)
15	1/2	21.34 ±0.10	2.77 + 0.51	42.20	134.00	3.73 + 0.51	59.75	191.00
20	3/4	26.67 ±0.10	2.87 + 0.51	33.75	109.00	3.91 + 0.51	48.50	155.20
25	1	33.40 ±0.13	3.38 + 0.51	31.60	100.00	4.55 + 0.53	44.25	141.00
32	1 1/4	42.16 ±0.13	3.56 + 0.51	26.00	83.20	4.85 + 0.58	36.60	116.80
40	1 1/2	48.26 ±0.15	3.68 + 0.51	23.25	74.00	5.08 + 0.61	33.00	108.00
50	2	60.32 ±0.15	3.91 + 0.51	19.65	63.08	5.54 + 0.66	28.10	91.00
65	2 1/2	73.02 ±0.18	5.16 + 0.61	21.10	68.25	7.01 + 0.84	29.55	96.08
80	3	88.90 ±0.20	5.49 + 0.66	18.25	59.00	7.62 + 0.91	26.00	83.00
100	4	114.30 ±0.23	6.02 + 0.71	15.50	53.00	8.56 + 1.02	22.50	73.44
150	6	168.28 ±0.28	7.11 +0.86	12.60	39.00	10.97 +1.32	19.65	62.00
200	8	219.10 ±0.38	8.18 + 0.99	11.20	35.00	12.70 + 1.52	17.50	55.00
250	10	273.00 ±0.38	9.27 + 1.12	9.90	31.00	15.06 + 1.80	16.20	52.00

Note:
- Burst pressure requirement of uPVC schedule 80 fittings are same as burst pressure of uPVC schedule 80 pipes
- For threaded pipes & fittings, the working pressure at 23°C shall be considered as 50% of rating
- Pressure rating of uPVC pipes & fittings is temperature related. Derating factor shall be applied for applications at higher temperatures

TEMPERATURE DE-RATING FACTOR FOR EASYFIT uPVC PIPES & FITTINGS

Temperature °C	De-rating Factor
0 to 23	1.00
27	0.88
33	0.75
40	0.60
50	0.38
55	0.30
60	0.22

As temperature of fluid flowing through installation increases; the pressure withstanding capacity of installation decreases. So to find out the pressure rating of EASYFIT Pipes & Fittings at a required temperature, multiply the pressure rating at 23°C of respective pipe size by the de-rating factor given in above table.

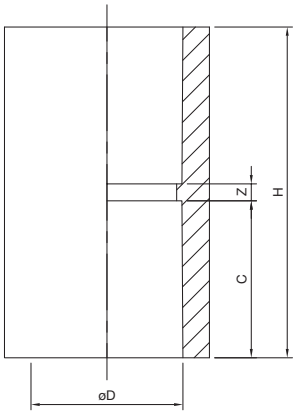
Rated pressure of installed system ½" Sch-80 Pipe = 59.75Kg,
Up to 23°C, the system can stand 59.75Kg pressure,
If Temperature is 40°C, derating factor is 0.60,
Therefore, the working pressure will be 59.75 x 0.60 = 35.85Kg.
So, 1/2" Sch-80 pipe can withstand 35.85Kg at 40° C.

FITTINGS DIMENSION

COUPLER

COUPLER (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	H
15	1/2	21.34	22.25	2.40	46.90
20	3/4	26.67	25.40	2.40	53.20
25	1	33.40	28.60	2.40	59.60
32	1 1/4	42.16	31.75	2.40	65.90
40	1 1/2	48.26	34.95	2.40	72.30
50	2	60.32	38.10	2.40	78.60
65	2 1/2	73.02	44.45	4.80	93.70
80	3	89.90	47.65	4.80	100.10
100	4	114.30	57.15	4.80	119.10



COUPLER (SCH 40) (Plus)

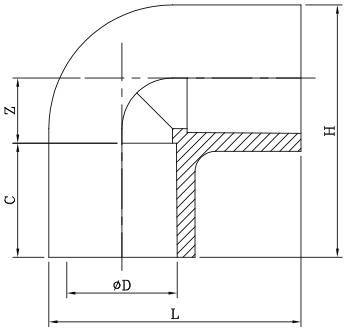
Size (mm)	Size (inch)	ØD	C	Z	H
15	1/2	21.55	19.20	2.60	41.00
20	3/4	26.85	26.20	2.20	54.60
25	1	33.65	29.00	2.80	60.80
32	1 1/4	42.40	31.80	2.90	66.50
40	1 1/2	48.55	33.80	2.60	70.20
50	2	48.55	33.80	2.00	73.00
150*	6*	168.28	77.00	6.20	160.20

*Regular Schedule 40

ELBOW

ELBOW (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	H & L
15	1/2	21.34	22.25	12.70	49.45
20	3/4	26.67	25.40	14.30	57.10
25	1	33.40	28.60	17.45	67.45
32	1 1/4	42.16	31.75	22.20	80.00
40	1 1/2	48.26	34.95	25.40	89.70
50	2	60.32	38.10	31.75	105.75
65	2 1/2	73.02	44.45	38.10	126.25
80	3	89.90	47.65	46.05	145.95
100	4	114.30	57.15	58.75	181.85



ELBOW (SCH 40) (PLUS)

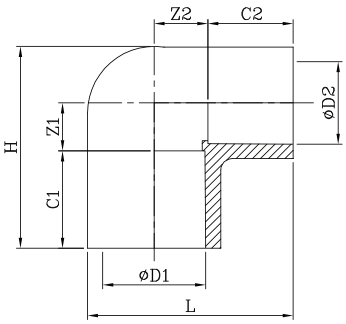
Size (mm)	Size (inch)	ØD	C	Z	H & L
15	1/2	21.55	20.20	12.50	45.30
20	3/4	26.85	26.00	15.40	56.70
25	1	33.65	28.40	19.20	66.65
32	1 1/4	42.40	31.80	23.50	78.85
40	1 1/2	48.55	30.40	28.40	87.10
50	2	60.65	30.80	35.00	100.40
150*	6*	168.28	77.00	89.50	258.15

*Regular Schedule 40

REDUCING ELBOW

(SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z1	Z2	H	L
20 X 15	3/4 X 1/2	26.67	21.34	25.40	22.25	12.50	14.02	52.65	53.65
25 X 15	1 X 1/2	33.40	21.34	28.60	22.25	14.52	18.17	61.15	61.80
25 X 20	1 X 3/4	33.40	26.67	28.60	25.40	14.52	17.87	61.15	64.65



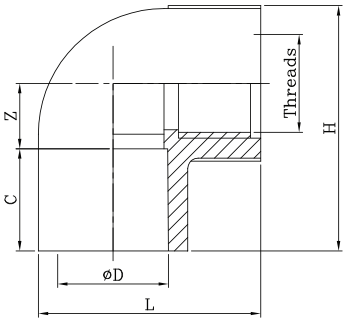
THREADED ELBOW

THREADED ELBOW (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
15	1/2	21.34	19.85	12.70	1/2" (14-TPI)	16.00	47.70	43.25
20	3/4	26.67	21.80	14.30	3/4" (14-TPI)	17.00	54.10	48.70
25	1	33.40	25.40	17.45	1" (11-TPI)	20.00	64.85	58.85

REDUCING THREADED ELBOW (SCH 80)

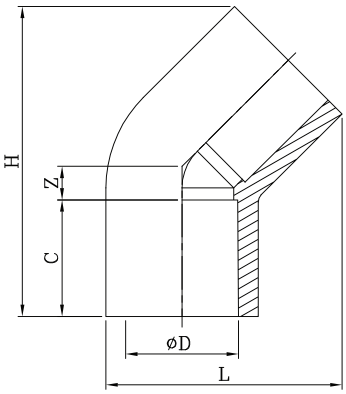
Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
20 X 15	3/4 X 1/2	26.67	21.80	14.30	1/2" (14-TPI)	16.00	54.10	48.70
25 X 15	1 X 3/4	33.40	25.40	17.45	3/4" (14-TPI)	17.00	64.85	58.85



ELBOW 45°

(SCH 80)

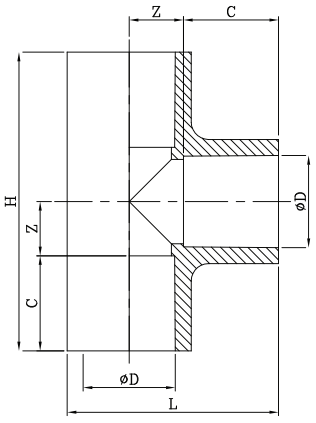
Size (mm)	Size (inch)	ØD	C	Z	H	L
15	1/2	21.34	22.25	6.40	59.20	45.05
20	3/4	26.67	25.40	8.00	69.30	53.30
25	1	33.40	28.60	8.00	77.60	62.35
32	1 1/4	42.16	31.75	9.60	89.00	73.70
40	1 1/2	48.26	34.95	11.20	99.55	82.80
50	2	60.32	38.10	15.90	117.50	99.35



EQUAL TEE

EQUAL TEE (SCH 80)

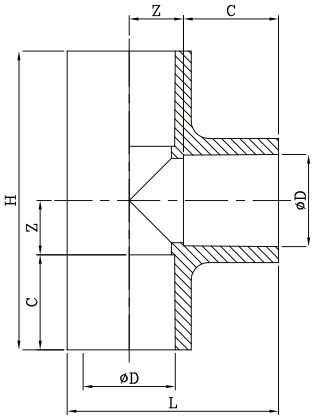
Size (mm)	Size (inch)	ØD	C	Z	H	L
15	1/2	21.34	22.25	12.70	69.90	49.45
20	3/4	26.67	25.40	14.30	79.40	57.10
25	1	33.40	28.60	17.45	92.10	67.45
32	1 1/4	42.16	31.75	22.20	107.90	80.00
40	1 1/2	48.26	34.95	25.40	120.70	89.70



EQUAL TEE

EQUAL TEE (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	H	L
50	2	60.32	38.10	31.75	139.70	105.75
65	2 1/2	73.02	44.45	38.10	165.10	126.25
80	3	89.90	47.65	46.05	187.40	145.95
100	4	114.30	57.15	58.75	231.80	181.85



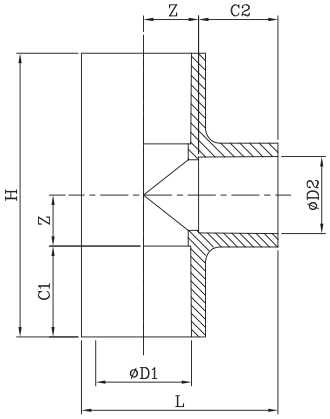
EQUAL TEE (SCH 40) (PLUS)

Size (mm)	Size (inch)	ØD	C	Z	H	L
15	1/2	21.55	20.40	11.20	63.20	45.30
20	3/4	26.85	24.00	16.00	80.00	56.50
25	1	33.65	27.00	17.80	89.60	64.90
32	1 1/4	42.40	31.20	22.50	107.40	78.50
40	1 1/2	48.55	33.60	25.50	118.20	88.20
50	2	60.65	35.50	31.00	133.00	101.30
150*	6*	168.28	77.00	89.50	333.00	258.15

*Regular Schedule 40

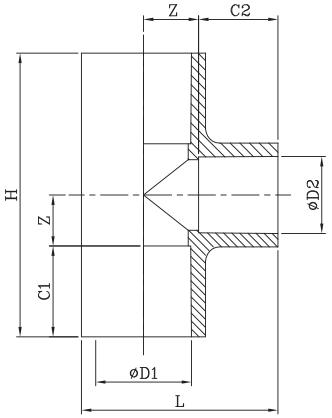
REDUCING TEE (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z	H	L
20 X 15	3/4 X 1/2	26.67	21.34	25.40	22.25	14.30	79.40	53.95
25 X 15	1 X 1/2	33.40	21.34	28.60	22.25	17.45	92.10	62.45
25 X 20	1 X 3/4	33.40	26.67	28.60	25.40	17.45	92.10	64.25
32 X 15	1 1/4 X 1/2	42.16	21.34	31.75	22.25	22.20	107.90	70.50
32 X 20	1 1/4 X 3/4	42.16	26.67	31.75	25.40	22.20	107.90	73.65
32 X 25	1 1/4 X 1	42.16	33.40	31.75	28.60	22.20	107.90	76.85
40 X 15	1 1/2 X 1/2	48.26	21.34	34.95	22.25	25.40	120.70	77.05
40 X 20	1 1/2 X 3/4	48.26	26.67	34.95	25.40	25.40	120.70	80.20
40 X 25	1 1/2 X 1	48.26	33.40	34.95	28.60	25.40	120.70	83.35
40 X 32	1 1/2 X 1 1/4	48.26	42.16	34.95	31.75	25.40	120.70	86.55
50 X 15	2 X 1/2	60.32	21.34	38.10	22.25	31.75	139.70	89.90
50 X 20	2 X 3/4	60.32	26.67	38.10	25.40	31.75	139.70	93.05
50 X 25	2 X 1	60.32	33.40	38.10	28.60	31.75	139.70	96.25
50 X 32	2 X 1 1/4	60.32	42.16	38.10	31.75	31.75	139.70	99.40



REDUCING TEE (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z	H	L
50 X 40	2 X 1 1/2	60.32	48.26	38.10	34.95	31.75	139.70	102.60
65 X 50	2 1/2 X 2	73.02	60.32	44.45	38.10	38.10	165.10	119.90
80 X 50	3 X 2	89.90	60.32	47.65	38.10	46.05	187.40	136.35
80 X 65	3 X 2 1/2	89.90	73.02	47.65	44.45	46.05	187.40	142.70
100 X 50	4 X 2	114.30	60.32	57.15	38.10	58.75	231.80	163.05
100 X 65	4 X 2 1/2	114.30	73.02	57.15	44.45	58.75	231.80	169.40
100 X 80	4 X 3	114.30	89.90	57.15	47.65	58.75	231.80	172.60



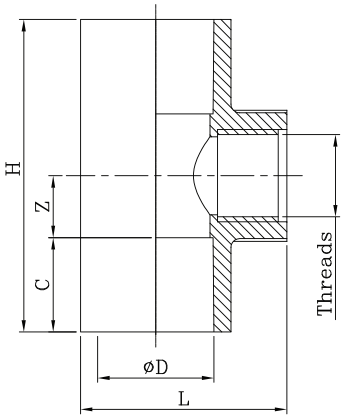
THREADED TEE

THREADED TEE (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L T	H	L
15	1/2	21.34	19.85	11.50	1/2" (14-TPI)	16.00	62.70	42.05
20	3/4	26.67	21.80	14.30	3/4" (14-TPI)	17.00	72.20	48.65
25	1	33.40	25.40	17.45	1" (11-TPI)	20.00	85.70	58.85

REDUCING THREADED TEE (SCH 80)

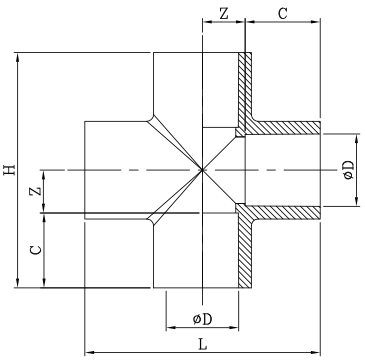
Size (mm)	Size (inch)	ØD	C	Z	Threads	L T	H	L
20 X 15	3/4 X 1/2	26.67	21.80	14.30	1/2" (14-TPI)	16.00	72.20	47.65
25 X 15	1 X 1/2	33.40	25.40	17.45	1/2" (14-TPI)	16.00	85.70	54.80
25 X 20	1 X 3/4	33.40	25.40	17.45	3/4" (14-TPI)	17.00	85.70	55.80



FOUR WAY TEE

(SCH 80)

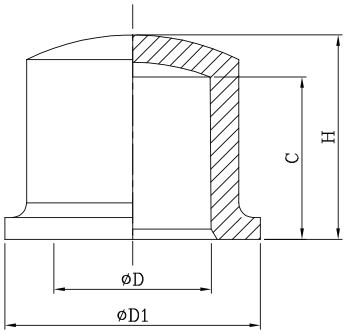
Size (mm)	Size (inch)	ØD	C	Z	H & L
15	1/2	21.34	22.25	12.70	69.90



END CAP

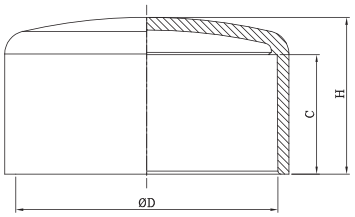
END CAP (SCH 80)

Size (mm)	Size (inch)	ØD	ØD1	C	H
15	1/2	21.34	35.00	22.25	28.00
20	3/4	26.67	41.00	25.40	32.00
25	1	33.40	49.00	28.60	37.00
32	1 1/4	42.16	58.10	31.75	41.00
40	1 1/2	48.26	64.75	34.95	45.00
50	2	60.32	77.75	38.10	50.00
65	2 1/2	73.02	91.60	44.45	55.00
80	3	89.90	108.10	47.65	60.00
100	4	114.30	136.65	57.15	71.00



END CAP (SCH 40)

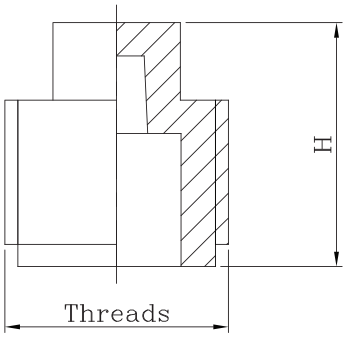
Size (mm)	Size (inch)	ØD	C	H
150	6	168.28	77.00	101.00



END PLUG

(SCH 80)

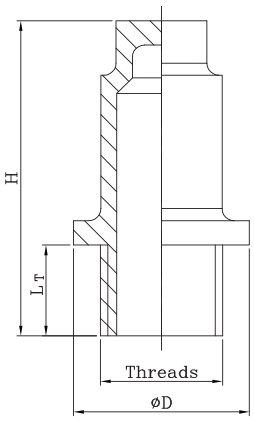
Size (mm)	Size (inch)	Threads	H
15	1/2	1/2" (14-TPI)	22.00
20	3/4	3/4" (14-TPI)	25.00
25	1	1" (11-TPI)	28.60
32	1 1/4	1 1/4" (11-TPI)	41.00
40	1 1/2	1 1/2" (11-TPI)	40.00



EXTENDED END PLUG

(SCH 80)

Size (mm)	Size (inch)	ØD	Threads	L_T	H
15	1/2	29.00	1/2" (14-TPI)	15.00	52.00
20	3/4	35.00	3/4" (14-TPI)	16.00	53.00



UNION

(SCH 80)

Size (mm)	Size (inch)	ØD	C	ØH	L
15	1/2	21.34	19.85	50.70	46.45
20	3/4	26.67	21.80	57.80	50.90
25	1	33.40	25.40	67.90	57.70
32	1 1/4	42.16	27.80	77.85	63.60
40	1 1/2	48.26	31.35	89.00	70.80
50	2	60.32	33.70	106.50	87.40

Refer Figure - 1

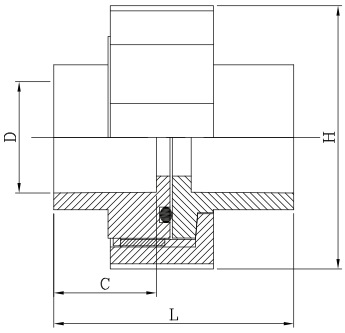


Figure - 1

Size (mm)	Size (inch)	ØD	C	ØH	L
65	2 1/2	73.02	44.45	130.20	102.30
80	3	89.90	47.65	156.00	109.20
100	4	114.30	57.15	192.90	130.40

Refer Figure - 2

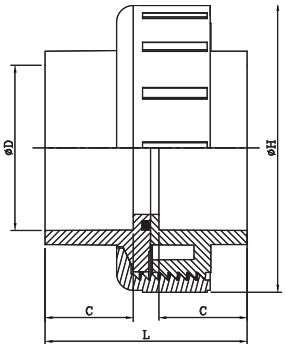
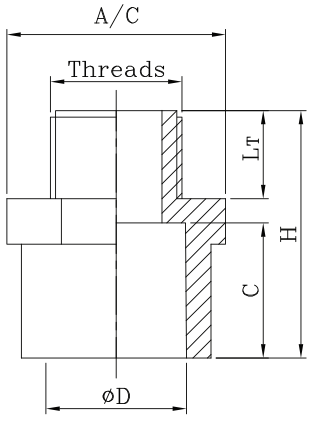


Figure - 2

MALE THREADED ADAPTOR

MALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
15	1/2	21.34	22.25	1/2" (14-TPI)	13.50	39.50	33.55
20	3/4	26.67	25.40	3/4" (14-TPI)	13.00	45.35	40.15
25	1	33.40	28.60	1" (11-TPI)	19.00	52.15	49.35
32	1 1/4	42.16	31.75	1 1/4" (11-TPI)	21.40	58.00	60.15
40	1 1/2	48.26	34.95	1 1/2" (11-TPI)	21.40	61.45	67.85
50	2	60.32	38.10	2" (11-TPI)	25.70	69.35	82.85
65	2 1/2	73.02	44.45	2 1/2" (11-TPI)	29.00	79.50	100.30
80	3	89.90	47.65	3" (11-TPI)	32.00	86.00	120.10
100	4	114.30	57.15	4" (11-TPI)	38.00	102.00	151.65



REDUCING MALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
20 X 15	3/4 X 1/2	26.67	25.40	3/4" (14-TPI)	12.50	44.40	39.80
25 X 20	1 X 3/4	33.40	28.60	1" (14-TPI)	14.00	49.10	49.05

FEMALE THREADED ADAPTOR

FEMALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L T	H	A/C
15	1/2	21.34	22.25	1/2" (14-TPI)	15.00	41.00	33.55
20	3/4	26.67	25.40	3/4" (14-TPI)	16.00	45.65	40.15
25	1	33.40	28.60	1" (11-TPI)	21.40	53.00	49.35
32	1 1/4	42.16	31.75	1 1/4" (11-TPI)	23.70	58.50	60.15
40	1 1/2	48.26	34.95	1 1/2" (11-TPI)	23.70	62.00	66.80
50	2	60.32	38.10	2" (11-TPI)	28.00	69.50	82.85
65	2 1/2	73.02	44.45	2 1/2" (11-TPI)	31.00	80.00	99.70
80	3	89.90	47.65	3" (11-TPI)	34.00	86.00	118.75
100	4	114.30	57.15	4" (11-TPI)	40.00	102.00	149.65

Refer Figure - 1

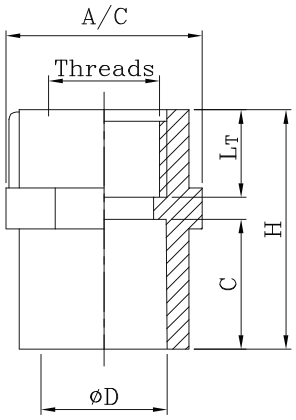


Figure - 1

REDUCING FEMALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L T	H	A/C
20 X 15	3/4 X 1/2	26.67	25.40	1/2" (14-TPI)	15.00	44.00	40.15

Refer Figure - 2

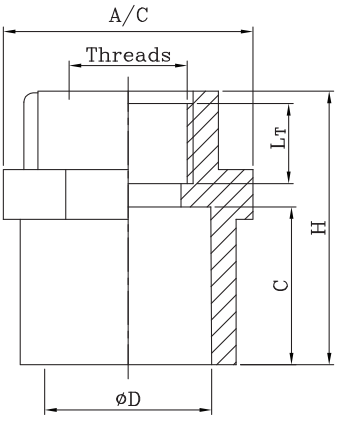
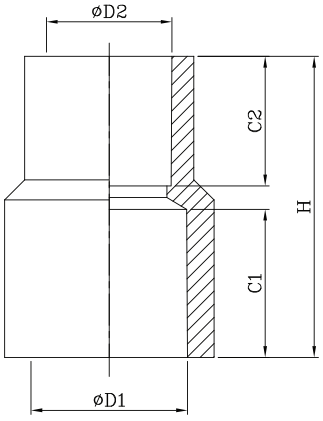


Figure - 2

REDUCER

(SCH 80)

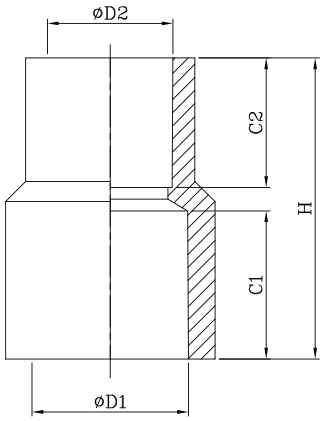
Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	H
20 X 15	3/4 X 1/2	26.67	21.34	25.40	22.25	51.65
25 X 15	1 X 1/2	33.40	21.34	28.60	22.25	56.85
25 X 20	1 X 3/4	33.40	26.67	28.60	25.40	60.00
32 X 15	1 1/4 X 1/2	42.16	21.34	31.75	22.25	62.00
32 X 20	1 1/4 X 3/4	42.16	26.67	31.75	25.40	64.00



REDUCER

(SCH 80)

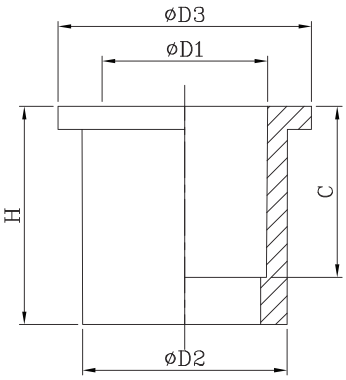
Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	H
32 X 25	1 1/4 X 1	42.16	33.40	31.75	28.60	66.35
40 X 15	1 1/2 X 1/2	48.26	21.34	34.95	22.25	62.00
40 X 20	1 1/2 X 3/4	48.26	26.67	34.95	25.40	65.00
40 X 25	1 1/2 X 1	48.26	33.40	34.95	28.60	69.55
40 X 32	1 1/2 X 1 1/4	48.26	42.16	34.95	31.75	72.70
50 X 25	2 X 1	60.32	33.40	38.10	28.60	72.70
50 X 32	2 X 1 1/4	60.32	42.16	38.10	31.75	75.85
50 X 40	2 X 1 1/2	60.32	48.26	38.10	34.95	79.05
65 X 50	2 1/2 X 2	73.02	60.32	44.45	38.10	92.50
80 X 50	3 X 2	89.90	60.32	47.65	38.10	104.00
80 X 65	3 X 2 1/2	89.90	73.02	47.65	44.45	106.00
100 X 50	4 X 2	114.30	60.32	57.15	38.10	126.50
100 X 65	4 X 2 1/2	114.30	73.02	57.15	44.45	128.00
100 X 80	4 X 3	114.30	89.90	57.15	47.65	123.50



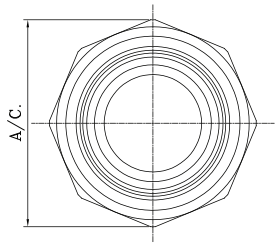
REDUCING BUSH

REDUCING BUSH (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	ØD3	C	H
20 X 15	3/4 X 1/2	21.34	26.67	33.00	22.25	28.40
25 X 15	1 X 1/2	21.34	33.40	40.00	22.25	31.60
25 X 20	1 X 3/4	26.67	33.40	40.00	25.40	31.60
32 X 15	1 1/4 X 1/2	21.34	42.16	47.30	19.85	30.80
32 X 20	1 1/4 X 3/4	26.67	42.16	47.30	21.80	30.80
32 X 25	1 1/4 X 1	33.40	42.16	48.00	28.60	35.00
40 X 15	1 1/2 X 1/2	21.34	48.26	53.50	19.85	34.35
40 X 20	1 1/2 X 3/4	26.67	48.26	53.50	21.80	34.35
40 X 25	1 1/2 X 1	33.40	48.26	54.00	28.60	38.00
40 X 32	1 1/2 X 1 1/4	42.16	48.26	54.00	31.75	38.00
50 X 15	2 X 1/2	21.34	60.32	65.50	19.85	36.70
50 X 20	2 X 3/4	26.67	60.32	65.50	21.80	36.70
50 X 25	2 X 1	33.40	60.32	65.50	25.40	36.70
50 X 32	2 X 1 1/4	42.16	60.32	65.50	27.80	36.70
50 X 40	2 X 1 1/2	48.26	60.32	65.50	31.35	36.70



REDUCING BUSH



REDUCING BUSH (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	H	A/C
65 X 50	2 1/2 X 2	73.00	54.00	44.45	43.20	51.45	85.70
80 X 50	3 X 2	88.80	54.00	47.65	43.20	55.65	106.00
80 X 65	3 X 2 1/2	88.80	73.00	47.65	44.45	55.65	106.00
100 X 50	4 X 2	114.00	54.00	57.15	43.20	65.15	133.40
100 X 65	4 X 2 1/2	114.00	73.00	57.15	44.45	65.15	133.40
100 X 80	4 X 3	114.00	88.90	57.15	47.65	65.15	133.40

Refer Figure - 1

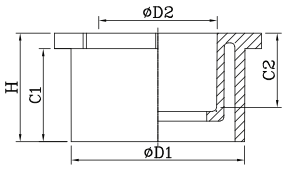
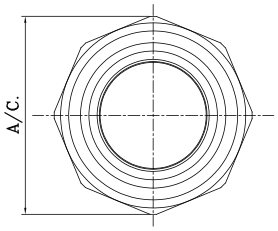


Figure - 1



REDUCING BUSH (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	H	A/C
65 X 40	2 1/2 X 1 1/2	72.90	48.55	44.45	34.95	51.45	85.70
80 X 40	3 X 1 1/2	88.80	48.55	34.95	34.95	55.65	106.00

Refer Figure - 2

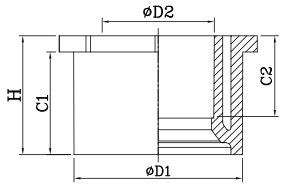
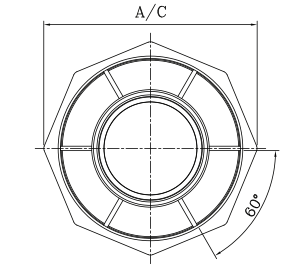


Figure - 2



REDUCING BUSH (SCH 40)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	H	A/C
150 X 80	6 X 3	88.90	168.20	77.00	48.00	85.00	183.72
150 X 100	6 X 4	114.30	168.20	77.00	51.00	85.00	183.72

Refer Figure - 3

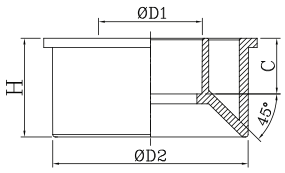
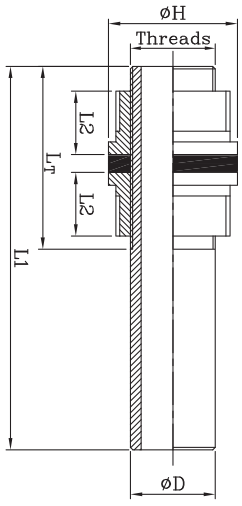


Figure - 3

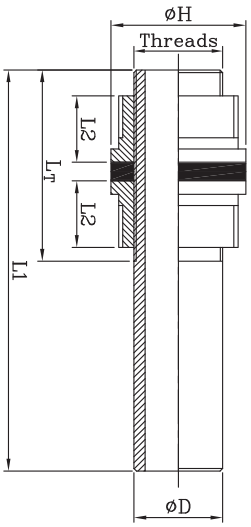
TANK CONNECTOR



(SCH 80) (FABRICATED)

Size (mm)	Size (inch)	ØD	Threads	LT	L1	L2
15	1/2	37.00	1/2" (14-TPI)	66.00	141.00	20.00
20	3/4	44.00	3/4" (14-TPI)	72.00	147.00	22.00
25	1	50.50	1" (11-TPI)	76.00	151.00	25.00
32	1 1/4	65.00	1 1/4" (11-TPI)	91.00	166.00	29.00

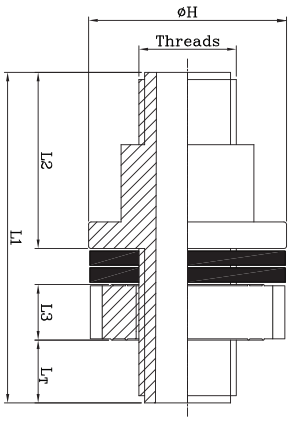
TANK CONNECTOR



(SCH 80) (FABRICATED)

Size (mm)	Size (inch)	ØD	Threads	L T	L1	L2
40	1 1/2	72.00	1 1/2" (11-TPI)	105.00	180.00	35.00
50	2	90.00	2" (11-TPI)	123.00	198.00	42.00
65	2 1/2	-	-	-	-	-
80	3	-	-	-	-	-
100	4	-	-	-	-	-

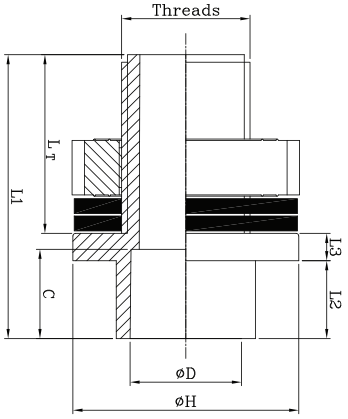
TANK CONNECTOR SHORT BODY



(SCH 80) (MOULDED)

Size (mm)	Size (inch)	ØH	Threads	L T	L1	L2	L3
15	1/2	41.00	1/2" (14-TPI)	14.50	68.50	36.50	11.50
20	3/4	45.50	3/4" (14-TPI)	18.50	75.50	39.50	11.50
25	1	56.00	1" (11-TPI)	22.50	86.50	45.50	12.50
32	1 1/4	65.00	1 1/4" (11-TPI)	23.50	93.00	49.00	14.50
40	1 1/2	71.00	1 1/2" (11-TPI)	28.50	102.00	53.00	14.50
50	2	83.00	2" (11-TPI)	29.50	103.50	53.50	14.50

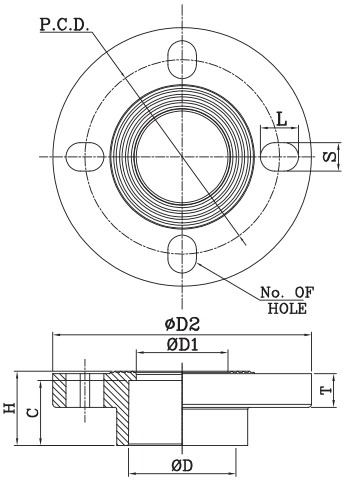
TANK CONNECTOR PLAIN



(SOCKET TYPE - MOULDED)

Size (mm)	Size (inch)	ØD	C	ØH	Threads	L T	L1	L2	L3
15	1/2	21.34	22.25	41.00	1/2" (14-TPI)	32.00	57.25	19.75	5.50
20	3/4	26.67	23.00	45.50	3/4" (14-TPI)	36.00	62.00	20.50	5.50
25	1	33.40	25.00	56.00	1" (11-TPI)	41.00	69.50	23.00	5.50
32	1 1/4	42.16	28.00	65.00	1 1/4" (11-TPI)	44.00	76.00	26.00	6.00
40	1 1/2	48.26	28.00	71.00	1 1/2" (11-TPI)	49.00	80.00	25.50	6.00
50	2	60.32	30.00	83.00	2" (11-TPI)	50.00	84.00	28.00	6.00

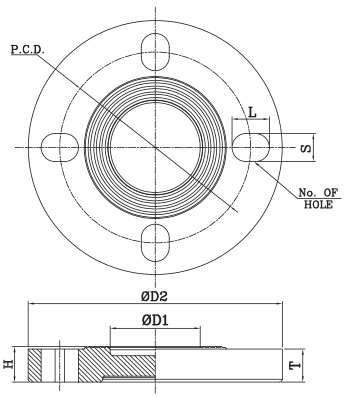
FLANGE WITH SOCKET



(1 PC) (SCH 80)

Size (mm)	Size (inch)	ØD	ØD1	ØD2	C	H	P.C.D	No. of Hole	L X S	T
25	1	33.40	27.00	115.00	28.60	33.70	81.50	04	20.50 x 14.00	15.00
32	1 1/4	42.16	27.00	125.00	31.75	38.00	91.00	04	21.50 x 15.50	16.00
40	1 1/2	48.26	40.10	134.50	34.95	40.60	98.00	04	20.50 x 14.00	18.00
50	2	60.32	53.50	160.00	38.10	44.30	118.50	04	25.00 x 17.00	18.00
65	2 1/2	73.02	62.75	177.00	44.45	50.85	133.00	04	26.00 x 19.50	23.00
80	3	89.90	77.80	189.00	47.65	55.50	148.00	04	22.00 x19.00	23.00
100	4	114.30	102.50	227.00	57.15	65.50	183.00	08	25.00 x19.00	27.50

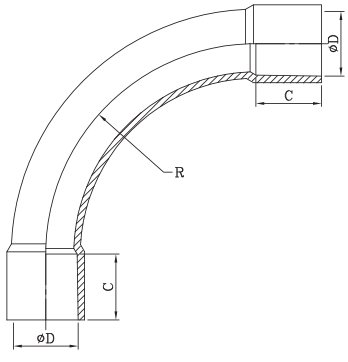
BLIND FLANGE



(1 PC) (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	H	P.C.D	No. of Hole	L X S	T
65	2 1/2	62.75	177.00	24.75	133.00	04	26.00 X 19.50	23.00
100	4	102.50	227.00	29.00	183.00	08	25.00 X 19.00	27.50

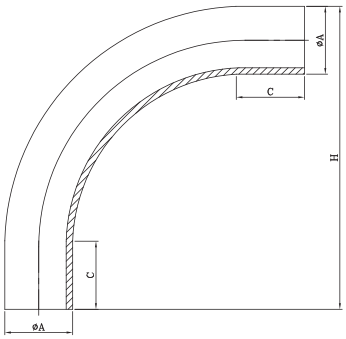
BEND 90°



(SOCKET TYPE) (FABRICATED)

Size (mm)	Size (inch)	ØD	C	R
15	1/2	21.34	22.25	61.00
20	3/4	26.67	25.40	71.00
25	1	33.40	28.60	94.00
32	1 1/4	42.16	31.75	126.50
40	1 1/2	48.26	34.95	135.00
50	2	60.32	38.10	158.50

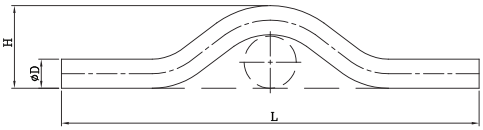
BEND 90°



(PLAIN) (FABRICATED)

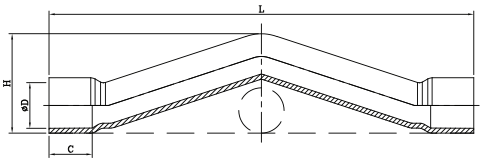
Size (mm)	Size (inch)	ØA	C	H
65	2 1/2	73.02	160.00	362.00
80	3	88.90	120.00	425.00

CROSS OVER



CROSS OVER (SCH 40) (FABRICATED)

Size (mm)	Size (inch)	ØD	H	L
15	1/2	21.34	53.00	400.00
20	3/4	26.67	58.50	400.00
25	1	33.40	72.00	450.00



CROSS OVER (SOCKET TYPE) (FABRICATED)

Size (mm)	Size (inch)	ØD	C	H	L
15	1/2	21.34	22.25	46.00	228.00
20	3/4	26.67	25.40	58.50	250.00
25	1	33.40	28.60	70.00	345.00

BALL VALVE

(SCH 80)

Size (mm)	Size (inch)
15	1/2
20	3/4
25	1
32	1 1/4
40	1 1/2
50	2
65	2 1/2
80	3
100	4

BRASS INSERT FITTINGS DIMENSIONS

MALE THREADED ADAPTOR

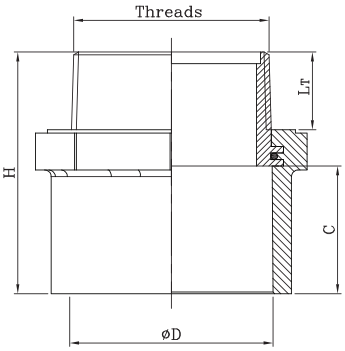


Figure - 1

MALE THREADED ADAPTOR (SHORT BODY) (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	LT	H
32	1 1/4	42.16	31.75	1 1/4" (BSPT)	19.10	60.25
40	1 1/2	48.26	34.95	1 1/2" (BSPT)	22.40	66.65
50	2	60.32	38.10	2" (BSPT)	23.20	72.10

Refer Figure - 1

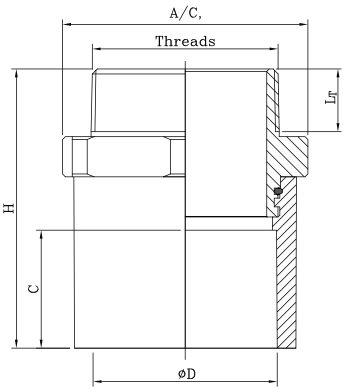


Figure - 2

MALE THREADED ADAPTOR (HEAVY) (SCH 80)

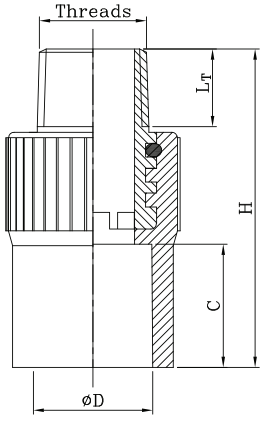
Size (mm)	Size (inch)	ØD	C	Threads	LT	H	A/C
65	2 1/2	73.02	47.00	2 1/2" (11 -TPI)	25.00	111.30	97.80
80	3	89.90	50.50	3" (11-TPI)	28.00	114.40	116.00

Refer Figure - 2

MALE THREADED ADAPTOR

MALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	LT	H
15	1/2	21.34	22.25	1/2" (14-TPI)	14.00	57.50
20	3/4	26.67	25.40	3/4" (14-TPI)	15.30	64.50
25	1	33.40	28.60	1" (11-TPI)	18.00	69.50
32	1 1/4	42.16	31.75	1 1/4" (11-TPI)	20.40	78.50
40	1 1/2	48.26	34.95	1 1/2" (11-TPI)	20.40	84.00



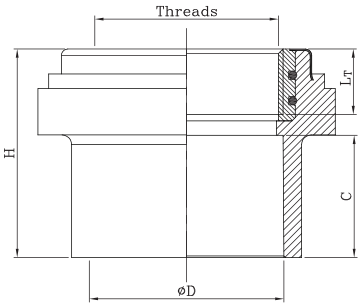
REDUCING MALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	LT	H
20 X 15	3/4 X 1/2	26.67	25.40	1/2" (14-TPI)	14.00	61.30
25 X 15	1 X 1/2	33.40	28.60	1/2" (14-TPI)	14.00	67.00

FEMALE THREADED ADAPTOR

(BRASS INSERT RING TYPE) (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H
32	1 1/4	42.16	32.00	1 1/4" (BSPT)	18.60	58.20
40	1 1/2	48.26	34.95	1 1/2" (BSPT)	19.00	61.50
50	2	60.32	38.10	2" (BSPT)	20.40	65.00



FEMALE THREADED ADAPTOR

FEMALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H
15	1/2	21.34	22.25	1/2" (14-TPI)	15.00	45.00
20	3/4	26.67	25.40	3/4" (14-TPI)	16.30	48.50
25	1	33.40	28.60	1" (11-TPI)	19.00	55.00
32	1 1/4	42.16	31.75	1 1/4" (11-TPI)	21.40	59.50
40	1 1/2	48.26	34.95	1 1/2" (11-TPI)	21.40	65.00

Refer Figure - 1

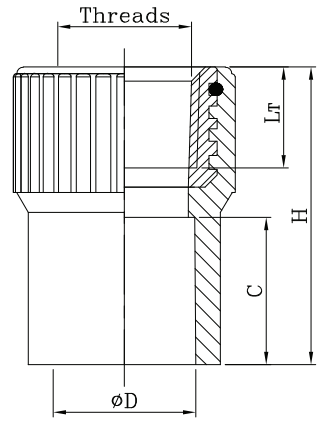


Figure - 1

FEMALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
65	2 1/2	73.02	47.00	2 1/2" (11-TPI)	28.00	87.40	109.50
80	3	89.90	50.50	3" (11-TPI)	28.00	90.20	126.70

Refer Figure - 2

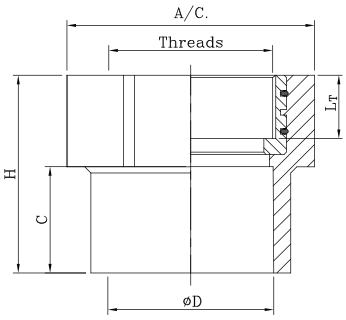


Figure - 2

REDUCING FEMALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H
20 X 15	3/4 X 1/2	26.67	25.40	1/2" (14-TPI)	15.00	48.40
25 X 15	1 X 1/2	33.40	28.60	1/2" (14-TPI)	15.00	52.00
25 X 20	1 X 3/4	33.40	28.60	3/4" (14-TPI)	16.30	53.50

Refer Figure - 3

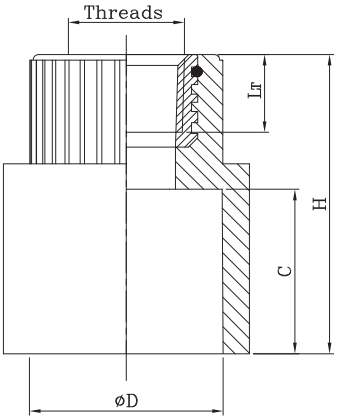


Figure - 3

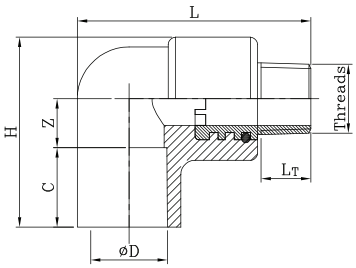
MALE THREADED ELBOW

MALE THREADED ELBOW (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
15	1/2	21.34	22.25	13.75	1/2" (14-TPI)	14.00	53.25	65.50
20	3/4	26.67	25.40	17.10	3/4" (14-TPI)	15.30	63.50	74.00
25	1	33.40	28.60	22.00	1" (11-TPI)	18.00	75.60	84.75

REDUCING MALE THREADED ELBOW (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
20 X 15	3/4 X 1/2	26.67	25.40	16.73	1/2" (14-TPI)	14.00	59.50	71.80
25 X 15	1 X 1/2	33.40	28.60	15.00	1/2" (14-TPI)	14.00	65.00	77.75
25 X 20	1 X 3/4	33.40	28.60	18.00	3/4" (14-TPI)	15.30	67.95	81.25



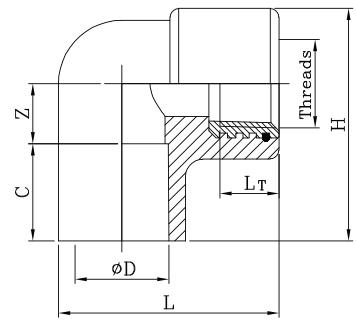
FEMALE THREADED ELBOW

FEMALE THREADED ELBOW (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
15	1/2	21.34	22.25	13.75	1/2" (14-TPI)	15.00	53.25	50.50
20	3/4	26.67	25.40	17.10	3/4" (14-TPI)	16.30	63.50	57.00
25	1	33.40	28.60	22.00	1" (11-TPI)	19.00	75.60	65.75
32	1 1/4	42.16	31.75	26.75	1 1/4" (11-TPI)	21.40	88.25	77.05

REDUCING FEMALE THREADED ELBOW (SCH 80)

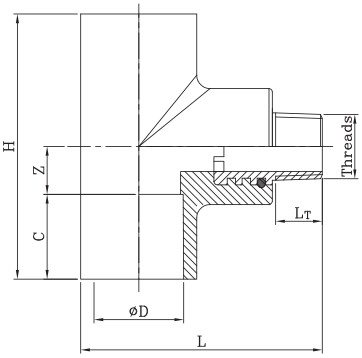
Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
20 X 15	3/4 X 1/2	26.67	25.40	16.73	1/2" (14-TPI)	15.00	59.50	56.80
25 X 15	1 X 1/2	33.40	28.60	15.00	1/2" (14-TPI)	15.00	65.00	62.75
25 X 20	1 X 3/4	33.40	28.60	18.00	3/4" (14-TPI)	16.30	67.95	81.25



MALE THREADED TEE

MALE THREADED TEE (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
15	1/2	21.34	22.25	12.70	1/2" (14-TPI)	14.00	69.90	65.55
20	3/4	26.67	25.40	14.30	3/4" (14-TPI)	15.30	79.40	74.40
25	1	33.40	28.60	17.45	1" (11-TPI)	18.00	92.10	84.75



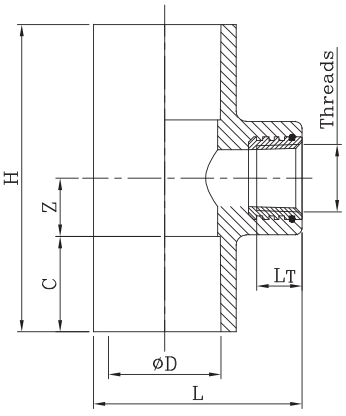
REDUCING MALE THREADED TEE (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
20 X 15	3/4 X 1/2	26.67	25.40	14.30	1/2" (14-TPI)	14.00	79.40	72.40
25 X 15	1 X 1/2	33.40	28.60	17.45	1/2" (14-TPI)	14.00	92.10	77.50
25 X 20	1 X 3/4	33.40	28.60	17.45	3/4" (14-TPI)	15.30	92.10	81.00

FEMALE THREADED TEE

FEMALE THREADED TEE (SCH 80)

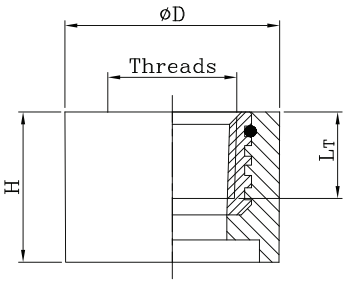
Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
15	1/2	21.34	22.25	12.70	1/2" (14-TPI)	15.00	69.90	50.55
20	3/4	26.67	25.40	14.30	3/4" (14-TPI)	16.30	79.40	57.40
25	1	33.40	28.60	17.45	1" (11-TPI)	19.00	92.10	65.75



REDUCING FEMALE THREADED TEE (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	Threads	L_T	H	L
20 X 15	3/4 X 1/2	26.67	25.40	14.30	1/2" (14-TPI)	15.00	79.40	57.40
25 X 15	1 X 1/2	33.40	28.60	17.45	1/2" (14-TPI)	15.00	92.10	62.50
25 X 20	1 X 3/4	33.40	28.60	17.45	3/4" (14-TPI)	16.30	92.10	64.00

REDUCING FEMALE THREADED BUSH



(SCH 80)

Size (mm)	Size (inch)	ØD	Threads	L_T	H
25 X 15	1 X 1/2	33.40	1/2" (14-TPI)	15.00	23.50

SOLVENT CEMENT

TIN

Size (ml)
50
100
250
500
1000

TIN (HEAVY)

Size (ml)
118
237
473
946

PRIMER CLEAR (TIN)

Size (ml)
118
237
473
964

TUBE

Size (ml)
25
50

PLASTIC STRIP P.T.F.E. TAPE

Size
12mm X 10mtr

QUALITY TEST

In order to assure high consistent quality level, PRINCE EASYFIT uPVC products undergo strict quality control at every stage of their realization. PRINCE PIPES & FITTINGS has established a laboratory with modern equipment's, which are handled by highly skilled and trained technicians.

- **VISUAL APPEARANCE:**
  Visual appearance of pipes and fittings are checked for uniformity of colour, surface finish and defect-free surface at production level.
- **DIMENSIONS:**
  All pipe and fittings dimensions are measured against relevant standard requirement, to ensure compatibility with other similar products.
- **DENSITY:**
  Density test for pipes and fittings is carried out to check the degree of uniformity among different samples, which indicates the accuracy of compound mixing.
- **HYDROSTATIC SYSTEM PRESSURE TEST:**
  All pipes & fittings are assembled and tested for 15 minutes with 1.5 times the rated pressure of lowest pressure rating of product for joint leakage.
- **TENSILE STRENGTH:**
  The pipes have been tensile-tested to check the materials' ability for pulling force at a constant rate, until the point of material break.
- **LONGITUDINAL HEAT REVERSION TEST:**
  This test is conducted to ensure that stresses embedded in the product during production process are within the limits so as to avoid operational failures.
- **STRESS RELIEF TEST:**
  This test is carried out to check residual stress in injection-moulded fitting parts which might lead to performance issues. Fittings are tested in air circulated oven at 150°C to check blisters & weld line split.
- **FLATTENING TEST:**
  Pipe samples are compressed in between two metal parallel metal plates with uniform loading till the opposite walls of pipe touch each other without splitting or cracking the pipe. This test is conducted to correct processing parameters of extrusion process.
- **IMPACT TEST:**
  Generally, at low temperatures, the impact energy of the material decreases. Hence to check the behaviour of the pipes at low temperature according to norms; the pipe should not crack & fail during this test.
- **OPACITY TEST:**
  Opacity test is carried out to check optical characteristics of pipes and fittings wall.
- **BURST PRESSURE:**
  Burst testing is used to determine the maximum pressure at which a given component will fail when pressurized under controlled conditions. Pipes and fittings needs to satisfy the burst pressure test value given in standard.

TESTING THE INSTALLATION

- Only water is recommended for conducting pressure test of installation; do not use air or any gases for pressure testing of installation.
- The installation should be adequately clamped to limit the movement, because water under pressure exerts thrust force in piping system.
- The piping system should be slowly filled with water and velocity must not exceed 0.3m/s, taking care to prevent surge and air entrapment.
- All trapped air must be slowly released. Vents must be provided to at all high points of the piping system. All valves and relief mechanisms should be opened so that the air can be vented while the system is being filled. Trapped air is extremely dangerous and it must be slowly and completely vented prior to testing.
- Once an installation is completed and cured the system should be filled with water and pressure tested for 1.5 times of lowest pressure rated component installed in system.
- The pressure test up to half an hour is sufficient. Any leaking joints or pipe must be cut out and replaced and the line recharged and retested using the same procedure.

HANDLING AND STORAGE OF uPVC PIPES, FITTINGS & SOLVENT CEMENT

A. HANDLING

1. On receipt of pipes and fittings, check & inspect for any damages during transportation. Inspect pipe and fittings ends for cracks or damage.
2. Do not drop pipe from truck and do not step on pipe.
3. Do not handle pipe carelessly during unloading, shifting, jointing practices etc. This may cause permanent damage to the pipe and fittings.
4. Do not drag or drop the pipes & fittings while unloading, shifting, etc.
5. Avoid contact of pipes & fittings with any sharp edges/object.

B. STORAGE & SITE TRANSPORTATION

1. Pipe shall be stored under covered area to protect from sunlight & UV discoloring effect.
2. Pipe shall be stored on leveled flat ground which is free of sharp edged stones.
3. Different class pipes of same diameter should not be stacked together, if such pipes are stacked together, higher thickness pipes should be at the bottom & lower thickness above them.
4. Ideally pipe shall be stored on timber support of at least 100mm width & breadth. These supports should be placed from side at an interval of 0.9 meters distance from eachother.
5. The stacking height of pipe stack shall be less than 1.5 meter.
6. While transporting pipes at site using trollies, etc. ensure full length of pipe is supported on flat surface of trolley.
7. If various diameter and class of pipes need to be transported together, keep pipes with higher diameter and wall thickness at the bottom.

C. HANDLING AND STORAGE OF SOLVENT CEMENT

1. Always keep solvent and primers in dry & cool place.
2. Does not use or store solvent cement near source of ignition like spark, heat, flame, open flame, etc.
3. Do not smoke, eat & drink when working with solvent cement for jointing.
4. Ensure work area is well ventilated; avoid breathing of solvent vapors which can pose serious safety hazards.
5. Keep containers of solvent & primers tightly closed except when the product is being used.
6. Follow instructions given on solvent and primer container by the solvent cement manufacturer.
7. Avoid contact with eye and skin. In case of eye contact, flush the eyes with water for 15 minutes and call physician immediately.
8. Do not use rags and bare hands to apply solvent cement: use swabs, brush, etc. to apply solvent cement.
9. Wear personal protection equipment like safety glass and solvent resistant gloves while working with solvents & primers.
10. Protect solvent cement from freezing, if solvent cements looks like a gel then it should be discarded as it cannot be recovered.

Refer ASTM F 402 “Standard Practice for Safe Handling of Solvents, Primers and Cleaners Used for Joining Thermoplastic Pipe and Fitting”.

THERMAL EXPANSION & CONTRACTION

Thermal expansion & contraction is a common occurence in most plastic piping materials, it is the ratio of change in pipe length per degree change in temperature. While dealing with plastic piping system one should remember that PVC expands about 5 times more than steel piping system. So while designing plastic piping system pipe run more than 30 meter length allowance of 1/3rd expansion and contraction should be calculated for every 10° change between ambient installation temperatures & maximum operating temperatures. The change in pipe length can be significant if the temperature variation is large between installation temperature and operating temperature. Therefore, allowances must be made for this resulting change in length. However the stresses developed in PVC pipe are generally smaller than those developed in steel/metal pipes for equal temperature changes because of the differences in elastic modulus of PVC & metal pipe. **Generally, thermal expansion and contraction can be accommodated with change in direction; long straight run may require an offset or expansion loop.**

Expansion and contraction can be calculated using following formula,

$$\delta = L^* \alpha * \Delta T$$

WHERE:

- δ = expansion (+) or contraction (-) in length, (mm)
- L = Initial pipe length in, (meter)
- α = coefficient of thermal expansion (for PVC = 0.06mm/m.°C)
- ΔT = Change in temperature (°C)

FRICTION LOSS

FRICTION LOSS IN PIPE

The Hazen-william equation is generally used for calculating frictional head loss in any piping system. The “C” value which is surface roughness constant for PRINCE EASYFIT uPVC pipes is 150. As uPVC pipes are resistant to scaling & fouling means that friction pressure losses in the flow of fluid are very negligible against the metal pipes subject to scaling.

$$f = 0.2167^* \left(\frac{100}{C}\right)^{1.852} * \frac{g^{1.852}}{d^{4.8655}} * L$$

WHERE:

- ‘f = frictional head loss in meter
- ‘d = inside diameter of pipe in meter
- ‘g = flow rate in (m^3/sec)
- C = surface roughness constant for pipe
- L = Length of pipe line

Below table provides surface roughness constant “C” for different piping materials

“C” Surface roughness constant	Pipe type
150	PVC & CPVC pipe
130-140	New steel, CI & Copper pipes
120	Old steel, CI & Copper pipes
110	GI (galvanized) pipes
60 - 80	Worn/pitted CI pipes

FRICTION LOSS TABLE FOR CPVC SCH 40 & SCH 80 PIPES AS PER ASTM F 441

Flow in lpm	Velocity in m/s	Pressure loss in mbar/ meter	Velocity in m/s	Pressure loss in mbar/ meter	Velocity in m/s	Pressure loss in mbar/ meter	Velocity in m/s	Pressure loss in mbar/ meter	Velocity in m/s	Pressure loss in mbar/ meter	Velocity in m/s	Pressure loss in mbar/ meter
	1/2" SCH 40		3/4" SCH 40		1" SCH 40		1.1/4" SCH 40		1.1/2" SCH 40		2" SCH 40	
10	0.87	5.039	0.49	1.389	0.30	0.441	0.17	0.124	0.13	0.061	0.08	0.0189
15	1.30	10.264	0.74	2.829	0.45	0.898	0.26	0.252	0.19	0.123	0.19	0.0927
20	1.74	17.014	0.99	4.688	0.60	1.486	0.35	0.417	0.25	0.204	0.25	0.1534
25	2.17	25.189	1.23	6.937	0.75	2.198	0.43	0.616	0.32	0.302	0.32	0.2268
30	2.61	34.721	1.48	9.558	0.91	3.026	0.52	0.848	0.38	0.415	0.38	0.3122
35	-	-	1.72	12.535	1.06	3.966	0.61	1.111	0.45	0.544	0.45	0.4090
40	-	-	1.97	15.858	1.21	5.014	0.69	1.404	0.51	0.687	0.51	0.5168
45	-	-	2.22	19.515	1.36	6.166	0.78	1.726	0.57	0.845	0.57	0.6354
50	-	-	2.46	23.499	1.51	7.420	0.87	2.077	0.64	1.016	0.64	0.7643
60	-	-	2.96	32.420	1.81	10.224	1.04	2.860	0.76	1.399	0.76	1.0522
70	-	-	-	-	2.11	13.408	1.21	3.749	0.89	1.834	0.89	1.3789
80	-	-	-	-	2.41	16.962	1.39	4.740	1.02	2.318	1.02	1.7431
90	2 1/2" SCH 40		-	-	2.72	20.874	1.56	5.830	1.15	2.851	1.15	2.1435
100	0.54	0.5503	3" SCH 40		-	-	1.73	7.016	1.27	3.430	1.27	2.5793
125	0.68	0.8137	0.44	0.3597	4" SCH 40		2.17	10.390	1.59	5.077	1.59	3.8178
150	0.81	1.1203	0.53	0.4951	0.31	0.1788	2.60	14.325	1.91	6.996	1.91	5.2613
175	0.95	1.4683	0.61	0.6487	0.36	0.2342	6" SCH 40		2.23	9.177	2.23	6.9017
200	1.08	1.8561	0.70	0.8198	0.41	0.2960	0.18	0.0641	2.55	11.611	2.55	8.7327
250	1.35	2.7466	0.88	1.2125	0.51	0.4376	0.23	0.0947	8" SCH 40			
300	1.62	3.7841	1.05	1.6698	0.61	0.6024	0.27	0.1303	0.16	0.0463		
400	2.17	6.2777	1.40	2.7676	0.82	0.9978	0.36	0.2157	0.21	0.0766		
500	2.71	9.3020	1.75	4.0973	1.02	1.4761	0.45	0.3189	0.26	0.1133		
600	-	-	2.10	5.6474	1.22	2.0331	0.54	0.4390	0.31	0.1559		

	1/2" SCH 80		3/4" SCH 80		1" SCH 80		1.1/4" SCH 80		1.1/2" SCH 80		2" SCH 80	
10	1.13	8.200	0.60	2.032	0.36	0.630	0.20	0.167	0.15	0.080	0.09	0.0243
15	1.69	16.707	0.91	4.140	0.55	1.282	0.31	0.340	0.22	0.163	0.22	0.1220
20	2.25	27.700	1.21	6.860	0.73	2.122	0.41	0.563	0.30	0.269	0.30	0.2020
25	2.82	41.021	1.51	10.153	0.91	3.138	0.51	0.833	0.37	0.398	0.37	0.2986
30			1.81	13.990	1.09	4.321	0.61	1.146	0.44	0.548	0.44	0.4110
35			2.11	18.351	1.28	5.664	0.71	1.502	0.52	0.717	0.52	0.5384
40			2.41	23.218	1.46	7.160	0.81	1.898	0.59	0.906	0.59	0.6804
45			2.72	28.577	1.64	8.806	0.92	2.334	0.66	1.114	0.66	0.8365
50					1.82	10.598	1.02	2.808	0.74	1.340	0.74	1.0062
60					2.19	14.604	1.22	3.867	0.89	1.846	0.89	1.3854
70					2.55	19.155	1.43	5.069	1.03	2.419	1.03	1.8157
80					2.92	24.235	1.63	6.410	1.18	3.058	1.18	2.2953
90	2 1/2" SCH 40						1.83	7.884	1.33	3.760	1.33	2.8227
100	0.61	0.6961	3" SCH 40				2.04	9.489	1.48	4.524	1.48	3.3967
125	0.77	1.0294	0.49	0.4475	4" SCH 40		2.55	14.055	1.85	6.697	1.85	5.0284
150	0.92	1.4173	0.59	0.6160	0.34	0.2159			2.21	9.230	2.21	6.9305
175	1.07	1.8576	0.69	0.8071	0.39	0.2828	6" SCH 40		2.58	12.109	2.58	9.0926
200	1.23	2.3483	0.79	1.0201	0.45	0.3574	0.20	0.0771	2.95	15.323	2.95	11.5063
250	1.53	3.4753	0.98	1.5088	0.56	0.5284	0.25	0.1140	8" SCH 40			
300	1.84	4.7885	1.18	2.0780	0.68	0.7275	0.30	0.1569	0.17	0.0555		
400	2.46	7.9454	1.58	3.4445	0.90	1.2049	0.40	0.2597	0.23	0.0918		
500	-	-	1.97	5.0999	1.13	1.7826	0.50	0.3839	0.29	0.1357		
600	-	-	-	-	1.35	2.4554	0.60	0.5285	0.34	0.1868		

FRICTION LOSS IN FITTINGS

Frictional losses through various types of injection moulded uPVC fittings are calculated from the equivalent length of straight pipe. The equivalent lengths of pipe for various common uPVC fittings for frictional loss are given in the below table.

MINOR LOSS FOR PVC FITTING IN EQUIVALENT LENGTH OF STRAIGHT PIPE IN METER

Fitting	Size in (inch)									
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6
90° Standard Elbow	1.10	1.37	1.62	2.04	2.29	2.62	2.99	3.38	3.99	6.07
45° Elbow	0.24	0.34	0.43	0.55	0.64	0.79	0.95	1.22	1.55	2.44
Tee straight run Flow	0.30	0.43	0.52	0.70	0.82	1.31	1.55	1.89	2.53	3.81
Tee branch Flow	1.22	1.52	1.83	2.13	2.44	3.66	4.57	4.88	6.71	9.97

SUPPORT SPACING

PRECAUTIONS TO BE TAKEN WHEN CLAMPING THE PIPES

- Pipe Support spacing are a function of size, thickness, rating, material operating condition /temperature, fluid density & concentrated weight (such as flanges, valves, fittings etc).
- Pipes should be installed in such a way as to ensure that the minimum amount of stress is induced in the system from movement caused by expansion contraction or any forces.
- uPVC Pipes should not be restrained in the hoop direction by straps or clamps made from unyielding material.
  The use of a compressible material such as rubber of foamed polyethylene between clamp and pipe is recommended.
- Pipes should be free to more in the longitudinal direction unless otherwise fixed for expansion / contraction control.
- Recommended distance for horizontal or vertical support centers are given in below table.
- uPVC pipes should be installed at sufficient distance from sources of heat to prevent damages due to radiant heat.
- uPVC pipes and fittings installed above ground should be protected from direct sunlight.

CLAMPING DISTANCE

Pipe Diameter	(mm)		15	20	25	32	40	50	65	80	100	150	200	250
	(inch)		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
Horizontal Clamp Spacing Distance for SCH - 40 Pipes	27°C	(cm)	135	150	165	165	180	180	210	210	225	244	274	290
	40°C	(cm)	120	120	135	150	150	150	180	180	195	229	259	274
	50°C	(cm)	75	75	90	90	105	105	120	120	135	152	168	198
Horizontal Clamp Spacing Distance for SCH - 80 Pipes	27°C	(cm)	160	180	195	195	210	210	250	250	270	290	305	335
	40°C	(cm)	140	140	160	180	180	180	210	210	230	259	290	320
	50°C	(cm)	90	90	105	105	120	120	140	140	160	198	229	244

Note:

1. The above spacing figures are only to be used as reference.
2. The above support spacing are based on of water fluid having density about 1gm/cm3.
3. For Vertical installations, use 27° spacing distance or according to vertical load involved

WATER HAMMER & SURGE PRESSURE

When the flow rate of a fluid in a pipeline is changed, the velocity of fluid changes, causing a pressure surge that is called as Surge pressure or Water hammer. Such surges take place wherever there is a change in direction in the pipe, but potentially more seriously, they may be generated by any of the following:

- Pump start or stop
- Trapped air in the system
- Fast opening or closing of valves

The longer the pipelines and faster the velocity, the greater the shock load will be. And this shock load can be of sufficient force to cause a failure in pipe, fitting or valve. For this, due consideration must be given when designing a pipeline.

THE WATER HAMMER SURGE PRESSURE + THE SYSTEM OPERATING PRESSURE SHOULD NOT EXCEED 1.5 TIMES THE RECOMMENDED WORKING PRESSURE RATING OF THE SYSTEM.

In order to minimize hydraulic shock due to water hammer, linear fluid velocity should generally be limited to 1.5 meter/second. Velocity at system startup/testing should be limited to 0.3 meter/second during filling the system, until it is ensured that all entrapped air is removed from the system before startup or testing the system with pressure.

Air should not be allowed to accumulate in the system while it is operating. Pump should not be allowed to draw in air. Wherever necessary, extra protective equipment may be used to prevent water hammer damage.

SOLVENT CEMENT - HANDLING, CURING & NUMBER OF JOINTS

AVERAGE INITIAL SET TIME SCHEDULE FOR uPVC SOLVENT CEMENTS*

Temperature Range	Pipe diameter 1/2" to 11/4" 15mm to 32mm	Pipe diameter 1 1/2" to 2" 40mm to 50mm	Pipe diameter 2 1/2" to 6" 65mm to 150mm	Pipe diameter 8" onwards 200mm
20° to 45°C	2 minutes	5 minutes	30 minutes	2 hours
5° to 20°C	5 minutes	10 minutes	2 hours	6 hours
0° to 5°C	10 minutes	15 minutes	12 hours	24 hours

*Note: Initial set time is the necessary time to allow before the joint can be handled.

AVERAGE INITIAL CURE TIME SCHEDULE FOR uPVC SOLVENT CEMENTS*

Temperature Range (during assembly)	Pipe diameter 1/2" to 1 1/4" 15mm to 32mm		Pipe diameter 1 1/2" to 2" 40mm to 50mm		Pipe diameter 2 1/2" to 6" 65mm to 150mm		Pipe sizes 8" onwards 200mm
	Up to 11 Kg/cm² (160 psi)	11 to 26 kg/cm² (160 to 370 psi)	Up to 11 Kg/cm² (160 psi)	11 to 22 Kg/cm² (160 to 315 psi)	Up to 11 Kg/cm² (160 psi)	11 to 22 Kg/cm² (160 to 315 psi)	Up to 7 Kg/cm² (100 psi)
20° to 45°C	15 min	6 hours	30 min	12 hours	1 1/2 hours	24 hours	2 days
5° to 20°C	20 min	12 hours	45 min	24 hours	4 hours	2 days	4 days
0° to 5°C	30 min	48 hours	24 hours	96 hours	72 hours	8 days	8 days

*Note: Joint cure time is the necessary time to allow before pressurizing system.
Celcius to Fahrenheit : F = C x (9/5) + 32 | Conversion Kg/cm² to psi : 1kg/cm² = 14.223 psi

AVERAGE NUMBER OF JOINTS PER PINT (473ml) FOR uPVC**

Pipe Diameter	(mm)	15	20	25	32	40	50	65	80	100	150	200	250
	(inch)	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
Number of Joints	27°C	150	100	62	51	45	30	25	20	15	5	2 1/2	1 1/2

** Figures are estimate based on the laboratory test. Due to the number of variation in the field, these figures should be use as a general guide only.

BASIC PRINCIPLE OF SOLVENT WELDING

Solvent cement manufacturer recommendations:

We strongly recommend users to follow the instructions and recommendation given by solvent cement manufacturer before use of solvent cement.

- **One Step Solvent Cement is recommended for pipe & fitting diameter of up to 2" only. Use sky blue color solvent cement.**
- **Two Step Solvent Cement is recommended for joining of pipes and fittings diameter of 2 1/2" onwards. Initially use primer followed by heavy duty (Translucent) solvent cement.**

To consistently make good joints using solvent cement, the following should be carefully understood and followed.

ONE STEP SOLVENT CEMENTING PROCEDURE

1. The joining surface of socket & spigot must be softened and made semi-fluid.

   1/2" to 2" diameter pipes & fitting socket and spigot surface can be softened by using one step solvent cement (refer sketch 1). PRIMER IS NOT REQUIRED WITH ONE STEP SOLVENT CEMENT.

2. Apply sufficient quantity of solvent cement to fill the gap between pipe and fitting.

   Sufficient one step cement to fill the loose part of joint must be applied. Besides filling the gap, adequate thick cement layers will penetrate the surface and also remain wet until the joint is assembled (refer sketch 2).

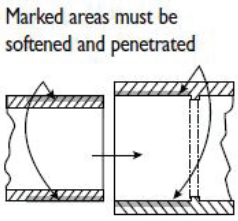
3. Assembly of pipe and fittings must be made while the surface are still wet and solvent cement is still fluid.

   If the one step solvent cement coating on the pipes and fittings are wet and fluid when assembly take place, they will tend to flow together and become one layer. Also, if the cement is wet, the surfaces beneath them will still be part of joint and these softened surfaces in the tight part of the joint will tend to fuse together (refer sketch 3).

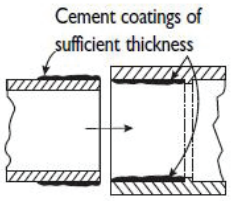
4. Joint strength develops as the cement dries. In the tight part of the joint, the surface will tend to fuse together; in the loose part, the cement will bond to both surfaces.

   As the solvent dissipates, the cement layer and the softened surfaces will harden with a corresponding increase in joint strength. A good joint will take the required working pressure long before the joint fully cured & become dry and final strength can be obtained (refer sketch 4). In the tight fused part of the joint, strength will develop more quickly than loose fused part of joint. The development of bond strength information about solvent cement joint is discussed in further pages of this technical manual.

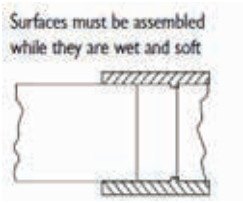
Remember solvent cement weld joint shall not be disturbed until the joint fully cured.



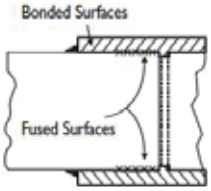
Sketch 1



Sketch 2



Sketch 3



Sketch 4

JOINTING PROCEDURE

1. Take the desired diameter of EF pipe which needs to be solvent welded. Mark the required length with the help of marker and measuring tape on pipe. Cut the pipe with the help of hack saw/carpenter saw. Ensure cut should be square to pipe axis.
2. Roughen the pipe insertion surface (externally) and socket of fitting (internally) by using emery paper.
3. Clean the cutting bur with the help of file/knife, make a chafer on external edge of pipe with the help of saw. Clean the pipe with the help of cloth. Ensure no cutting bur dust remain inside of the bore of pipe.
4. Take the EF fitting which is going to be welded with the pipe. Measure the socket length of the fitting & mark it on the pipe's external surface. Clean the fitting with dry cloth. Ensure no moisture shall remain on the pipe's external surface and the fitting's socket area of fitting.
5. Check for dry fitment of pipe and fitting. Pipe should enter fitting socket 2/3rd length easily and till the fitting socket end tightly up to mark which was marked with marker pen.
6. Use only PRINCE Easyfit solvent cement for one step and two step solvent welding joint.

ONE STEP SOLVENT CEMENTING PROCEDURE

- Apply even coat of solvent cement to the pipe spigot and to equal depth of fitting socket. Remember, the amount of solvent cement should be sufficient to fill the gap between spigot and socket. Repeat the procedure of applying solvent cement again to pipe spigot and fitting socket.

Avoid splashing of solvent cement on unwanted area of pipe and fitting

- While pipe spigot and fitting socket are still wet, immediately insert the pipe into the fitting socket with rotating the pipe 1/4th turns till it touches the bottom of the fitting with proper alignment. Ensure that the pipe touches the bottom of the fitting completely. Hold the assembly for 30 seconds for initial bonding.

Holding for 30 seconds is necessary due to tapered interference fitment of socket, otherwise pipe may come back again.

- If the bead of solvent cement is seen even at assembled joint juncture is the evidence of strong and good joint. It is the indication of sufficient solvent application for joint.

If bead is not form evenly around the joint juncture means solvent cement is insufficiently applied. In this situation joint must be discarded and joint must be begun again by cutting the discarded joint.

- Wipe the solvent cement excess bead with a cotton cloth/rag.
- Allow the assembled solvent cement joint to be set and cured.

TWO STEP (HEAVY DUTY) SOLVENT CEMENTING PROCEDURE

- The meaning of two step solvent cementing is to apply a primer to prepare the surface for making a good joint followed by solvent cement.

Primer must be applied on the surface of pipes spigot and fitting socket to prepare the bonding area for the addition of solvent cement and subsequent assembly. Use proper size swab/brush for applying primer.

- First apply primer inside of fitting socket surface then to the pipe external spigot surface end. Again apply primer second coat to fitting socket and pipe spigot. This repeated application is necessary to keep surface need to be welded wet. Ensure primer should not be splashed

Ensure splashing of primer and solvent cement within fitting surface and external pipe spigot surface where softening is not needed, this may cause damage.

- Apply solvent cement even coat to the pipe spigot to equal depth of fitting socket and fitting socket immediately while primer is still gluey. Remember the amount of solvent cement should be sufficient to fill the gap between spigot and socket. Repeat the procedure of applying solvent cement again to pipe spigot and fitting socket.

Avoid splashing of solvent cement on unwanted area of pipe and fitting.

- While pipe spigot and fitting socket are still wet, immediately insert the pipe into the fitting socket with rotating the pipe 1/4th turns till it touches to bottom of fitting with proper alignment. Ensure pipe must bottom completely too fitting end. Hold the assembly for 30 seconds for initial bonding.

Holding for 30 second is necessary due to tapered interference fitment of socket, otherwise the pipe may get undone.

- If the bead of solvent cement is seen even at assembled joint juncture that is evidence of a strong and good joint. It is the indication of sufficient solvent application for joint.

If bead is not form evenly around the joint juncture means solvent cement is insufficiently applied. In this situation joint must be discarded and joint must be begun again by cutting the discarded joint.

- Wipe the solvent cement excess bead with a cotton cloth/rag.
- Allow the assembled solvent cement joint to be set and cured.

TIPS FOR SOLVENT CEMENTING

IN HOT WEATHERS

A. Store solvent cement in cool place or shaded area prior to use.

B. If possible, store pipes & fittings, or end of the pipes to be solvent welded, in shaded area before using for solvent cementing.

C. Carry-out the solvent cement jointing activity under shaded area.

D. Wipe the surface of pipes & fitting which is to be joined with the help of cloth/rag. Ensure the surfaces are dry prior to applying solvent cement.

E. Try to do the solvent cementing jointing in cool morning hours.

F. Ensure that the pipe spigots and fitting sockets to be joined are still wet with solvent cement before inserting pipe spigot in fitting socket.

G. Before using solvent cement shake the container and stir the solution with swab/brush.

H. Final anchoring of uPVC piping system shall be carried in cooler hours of the day on account of expansion and contraction phenomenon.

IN COLD WEATHERS

A. Prefabricate system as much as possible in warm work area.

B. Store solvent cement in warm area and make sure it remain in fluid condition.

C. Special care to be taken to remove moisture from pipes and fittings which are to be welded with solvent cement.

D. Allow longer cure time to the joints of the system before putting them in operation.

THREADED FITTINGS

Male and female threaded fittings are available as transition fittings with purely & solely molded from uPVC material as well as with uPVC Brass insert moulding options.

- Don't use uPVC threaded female adaptors while using as a transition fitting with metallic threaded fitting or pipe. It is recommended to use uPVC male threads be screwed into metallic female threads rather than metallic male threads into uPVC female threads.
- Use of Teflon tape is recommended for all threaded connections. While applying Teflon tape on threads start with two wraps at the end of fitting end and wrap further threads overlapping half the width of the tape in the direction of the threads on each wind wrap.
- Before applying any type of thread sealant, check for its chemical compatibility with uPVC & brass material. Do not use sealant compound containing ammonia or chlorine on brass insert threaded fittings.
- Initially brass insert threaded fittings and uPVC fittings are tightened with hand and then with the help of wrench apply just half turn torque for final thread joint tightening.
- Pneumatic tools are not recommended for tightening.
- Do not clamp brass threads of fitting in bench vice.

DO's & DON'ts

DO's

A) DESIGN STAGE :

1. Consider provision for expansion and contraction of piping installation.
2. Consider pressure de-rating factor for use of pipe line at higher temperatures of maximum up to 45°C.

B) HANDLING, TRANSPORTATION & STORAGE:

1. Pipes & fittings shall be stored under covered area.
2. Pipe shall be stored on leveled flat ground.
3. The stacking height of pipe stack shall not be more than 1.5 meters.

C) JOINTING & INSTALLATION:

1. In case of threads to be done on pipes, parallel threads are recommended.
2. Use only Easyfit uPVC solvent cement for jointing. Other types of solvent cements may contain ingredients which are not recommended.
3. Cut the pipe at right angle to its axis.
4. Before making a joint, remove burr and clean the pipe surface/threads.
5. For solvent cement joint, rotate the pipe through a quarter turn while inserting in the fitting
6. Clean excess solvent cement which comes out from joint.
7. Cure the solvent joint at least for 24 hours in dry weather & 48 hours in humid weather.
8. For threaded joint, use Teflon tape for thread sealing.
9. Keep at least 200mm distance from geyser for pipeline passing nearby.
10. Use recommended spacing while clamping the installation.
11. In case of concealed pipeline, plastering with 1:4 mortar is recommended.

D) TESTING & COMMISSIONING:

1. Pressure test the installation with water only.
2. Before testing, ensure that all joints are cured fully.
3. Ensure that all valves and air relief mechanisms at the end of elevation are opened.
4. During initial filling of pipe line, limit water velocity up to 0.3 m/s for releasing the entrapped air.
5. Continue filling until entrapped air is completely removed from installation.

DON'ts

A) HANDLING, TRANSPORTATION & STORAGE:

1. Do not drag or drop/throw the pipes while loading/unloading & shifting.
2. Do not overhang the pipes out of vehicle body while transporting.
3. Do not stack the pipes for more than 1.5 meters height.

B) JOINTING & INSTALLATION:

1. Do not use solvent cement which is gelled/not free flowing.
2. While solvent cementing avoid source of heat or open flame.
3. Do not hammer the pipeline.
4. Do not over-tighten the threaded joints.

C) TESTING & COMMISSIONING:

1. Do not use air or gas for installation testing.

CHEMICAL RESISTANCE CHART OF uPVC

Chemical	23°C (73°F)	60°C (140°F)
A		
Acetaldehyde	N	N
Acetaldehyde, aq 40%	C	N
Acetamide - -	-	-
Acetic acid, vapor	R	R
Acetic acid, glacial	R	N
Acetic acid, 25%	R	R
Acetic acid, 60%	R	N
Acetic acid, 85%	R	N
Acetic anhydride	N	N
Acetone	N	N
Acetylene	N	N
Acetyl chloride	N	N
Acetylnitrile	N	N
Acrylonitrile	N	N
Acrylic acid	N	N
Adipic acid	R	R
Alcohol, allyl	R	C
Alcohol, amyl	N	N
Alcohol, benzyl	N	N
Alcohol, butyl (n-butanol)	R	R
Alcohol, diacetone	N	N
Alcohol, ethyl (ethanol)	R	R
Alcohol, hexyl (hexanol)	R	R
Alcohol, isopropyl (2-propanol)	R	R
Alcohol, methyl (methanol)	R	R
Alcohol, propyl (1-propanol)	R	R
Alcohol, propargyl	R	R
Allyl chloride	N	N
Alums	R	R
except Aluminim fluoride	R	N
Ammonia, gas	R	R
Ammonia, liquid	N	N
Ammonium salts	R	R
except Ammonium Dichromate	R	N
Ammonium fluoride, 10%	R	R
Ammonium fluoride, 25%	R	C
Amyl acetate	N	N

Chemical	23°C (73°F)	60°C (140°F)
Amyl chloride	N	N
Aniline	N	N
Aniline chlorohydrate	N	N
Aniline hydrochloride	N	N
Anthraquinone	R	R
Antimony trichloride	R	R
Anthraquinone sulfonic acid	R	R
Aqua regia	C	N
Arsenic acid, 80%	C	N
Aryl-sulfonic acid	R	R
B		
Barium salts	R	R
except Barium nitrate	R	N
Beer	R	R
Beet sugar liquor	R	R
Benzaldehyde, 10%	R	N
Benzene (benzol)	R	N
Benzene sulfonic acid, 10%	R	R
Benzene sulfonic acid, > 10%	N	N
Benzoic acid	R	R
Black liquor – paper	R	R
Bleach, 12% active chlorine	R	R
Bleach, 5% active chlorine	R	R
Borax	R	R
Boric acid	R	R
Brine	R	R
Bromic acid	R	R
Bromine, aq	R	R
Bromine, liquid	N	N
Bromine, gas, 25%	R	R
Bromobenzene	N	N
Bromotoluene	N	N
Butadiene	R	R

R - Generally Resistant

C - Less resistant than R but still suitable for some conditions

N - Not resistant

CHEMICAL RESISTANCE CHART OF uPVC

Chemical	23°C (73°F)	60°C (140°F)
Butane	R	R
Butynediol	R	N
Butyl acetate	N	N
Butyl stearate	R	N
Butyl phenol	R	N
Butylene, liquid	R	R
Butyric acid	R	N
C		
Cadmium Cyanide	R	R
Calcium salts	R	R
except Calcium bisulde	N	N
Calcium hypochlorite, 30%	R	R
Calcium hydroxide	R	R
Calcium Nitrate	R	R
Calcium Oxide	R	R
Calcium Sulfate	R	R
Camphor	R	N
Cane sugar liquors	R	R
Carbon disulfide	N	N
Carbon dioxide	R	R
Carbon dioxide, aq	R	R
Carbon monoxide	R	R
Carbitol	R	N
Carbon tetrachloride	R	N
Carbonic Acid	R	R
Castor oil	R	R
Caustic potash (potassium hydroxide),50%	R	R
Caustic soda (sodium hydroxide), <40%	R	R
Cellosolve	R	N
Cellosolve acetate	R	N
Chloral hydrate	R	R
Chloramine, dilute	R	N
Chloric acid, 20%	R	R
Chlorine, gas, dry	C	N
Chlorine, gas, wet	N	N
Chlorine, liquid	N	N
Chlorine water	R	R
Chloracetic acid, 50%	R	R

Chemical	23°C (73°F)	60°C (140°F)
Chloroacetyl Chloride	R	N
Chlorobenzene	N	N
Chlorobenzyl chloride	N	N
Chloroform	N	N
Chloropicrin	N	N
Chlorosulfonic acid	R	N
Chromic acid, 10%	R	R
Chromic acid, 30%	R	R
Chromic acid, 40%	R	C
Chromic acid, 50%	N	N
Chromium potassium sulfate	R	N
Citric acid	R	R
Coconut oil	R	R
Coffee	R	R
Coke oven gas	R	R
Copper acetate	R	N
Copper salts, aq	R	R
Corn oil	R	R
Corn syrup	R	R
Cottonseed oil	R	R
Cresote	N	R
Cresol, 90%	N	N
Cresylic acid, 50%	R	R
Croton aldehyde	N	N
Crude oil, sour	R	R
Cupric Salts, aq	R	R
Cyclohexane	N	N
Cyclohexanol	N	N
Cyclohexanone	N	N
D		
Detergents, aq	R	R
Dextrin	R	R
Dextrose	R	R
Dibutoxyethyl phthalate	N	N
Diesel fuels	R	R
Diethylamine	N	N
Diethyl Ether	R	N
Disodium phosphate	R	R

CHEMICAL RESISTANCE CHART OF uPVC

Chemical	23°C (73°F)	60°C (140°F)
Diglycolic acid	R	R
Dioxane -1,4	N	N
Dimethylamine	R	R
Dimethyl formamide	N	N
Dibutyl phthalate	N	N
Dibutyl sebacate	R	N
Dichlorobenzene	N	N
Dichloroethylene	N	N
E		
Ether	N	N
Ethyl ether	N	N
Ethyl halides	N	N
Ethylene halides	N	N
Ethylene glycol	R	R
Ethylene oxide	N	N
F		
Fatty acids	R	R
Ferric salts	R	R
Fish Oil	R	R
Fluorine, dry gas	R	N
Fluorine, wet gas	R	N
Fluoboric acid	R	R
Fluosilicic acid, 50%	R	R
Formadehyde	R	R
Formic acid	R	N
Freon - F11, F12, F113, F114	R	R
Freon - F21, F22	R	N
Fructose	R	R
Furfural	N	N
G		
Gallic acid	R	R
Gas, coal, manufactured	N	N
Gas, natural, methane	R	R
Gasolines	C	C
Gelatin	R	R
Glucose	R	R
Glue, animal	R	R
Glycerine (glycerol)	R	R

Chemical	23°C (73°F)	60°C (140°F)
Glycolic acid	R	R
Glycols	R	R
Grape Sugar	R	R
Green liquor, paper	R	R
H		
Heptane	R	R
Hexane	R	N
Hexanol	R	R
Hydraulic Oil	R	N
Hydrobromic acid, 20%	R	R
Hydrochloric acid	R	R
Hydrofluoric acid, 30%	R	N
Hydrofluoric acid, 50%	R	N
Hydrofluoric acid, 100%	N	N
Hydrofluosilic acid	R	R
Hydrocyanic acid	R	R
Hydrogen	R	R
Hydrogen cyanide	R	R
Hydrogen fluoride	N	N
Hydrogen phophide	R	R
Hydrogen peroxide, 50%	R	R
Hydrogen peroxide, 100%	R	R
Hydrogen sulfide, aq	R	R
Hydrogen sulfide, dry	R	R
Hydroquinone	R	R
Hydroxylamine sulfate	R	R
Hydrazine	N	N
Hypochlorous acid	R	R
I		
Iodine, aq, 10%	N	N
J		
Jet fules, JP-4 and JP-5	C	C

R - Generally Resistant

C - Less resistant than R but still suitable for some conditions

N - Not resistant

CHEMICAL RESISTANCE CHART OF uPVC

Chemical	23°C (73°F)	60°C (140°F)
K		
Kerosene	R	R
Ketones	N	N
Ketchup	R	N
Kraft paper liquor	R	R
L		
Lctic acid, 25%	R	R
Lactic acid, 80%	R	N
Lard oil	R	R
Lauric acid	R	R
Lauryl acetate	R	R
Lauryl chlorie	R	R
Lead salts	R	R
Lime sulfur	R	R
Linoleic acid	R	R
Linoleic oil	R	R
Linseed oil	R	R
Liqueurs	R	R
Lithium salts	R	R
Lubricating oils	R	R
M		
Magnesium salts	R	R
Maleic acid	R	R
Malic acid	R	R
Manganese sulfate	R	R
Mercuric salts	R	R
Mercury	R	R
Methane	R	R
Methoxyethl oleate	R	N
Methyl acetate	N	N
Methyl amine	N	N
Methyl bromide	N	N
Methyl cellosolve	N	N
Methyl chloride	N	N
Methyl chloroform	N	N
Methyl ethyl ketone	N	N
Methyl isobutyl carbinol	N	N
Methyl isopropyl ketone	N	N

Chemical	23°C (73°F)	60°C (140°F)
Methyl methacrylate	R	N
Methyl sulfate	R	N
Methyl sulfuric acid	R	R
Methylene bromide	N	N
Methylene chloride	N	N
Methylene iodide	N	N
Milk	R	R
Mineral oil	R	R
Molasses	R	R
Monochloroacetic acid	R	R
Monochlorobenzene	N	N
Monoethanolamine	N	N
Motor oil	R	R
N		
Naptha	R	R
Naphthalene	N	N
Natural Gas	R	R
Nickel acetate	R	N
Nickel salts	R	R
Nicotine	R	R
Nicotinic acid	R	R
Nitric acid, 0 to 40%	R	R
Nitric acid, 50%	R	C
Nitric acid, 100%	N	N
Nitrobenzene	N	N
Nitroglycerine	N	N
Nitrous acid, 10%	R	R
Nitrous oxide, gas	R	N
Nitroglycol	N	N
O		
Oleic acid	R	R
Oleum	N	N
Olive oil	R	R
Oxalic acid	R	R
Oxygen, gas	R	R
Ozone, gas	R	R

CHEMICAL RESISTANCE CHART OF uPVC

Chemical	23°C (73°F)	60°C (140°F)
P		
Palmitic acid, 10%	N	N
Palmitic acid, 70%	R	N
Paraffin	R	R
Pentane	C	C
Peracetic acid, 40%	R	N
Perchloric acid, 15%	R	N
Perchloric acid, 70%	R	N
Perchloroethylene	R	N
Perphosphate	R	N
Phenol	R	N
Phenylhydrazine	N	N
Phosphoric anhydride	R	N
Phosphoric acid	R	R
Phosphorus pentoxide	R	N
Phosphorous trichloride	N	N
Photographic chemicals, aq	R	R
Phthalic acid	N	N
Plating solutions, metal	R	R
Potash	R	R
Potassium amyl xanthate	R	N
Potassium salts, aq	R	R
except Potassium iodide	R	N
Potassium permanganate, 10%	R	R
Potassium permanganate, 25	R	N
Propane	R	R
Propylene dichloride	N	N
Propylene oxide	N	N
Pyridine	N	N
Pyrogallic acid	R	N
R		
Rayon coagulating bath	R	R
S		
Salicylic acid	R	R
Salicyladehyde	N	N
Selenic acid, aq.	R	R
Silicic acid	R	R
Silicone oil	R	N

Chemical	23°C (73°F)	60°C (140°F)
Silver salts	R	R
Soaps	R	R
Sodium salts, aq	R	R
except Sodium chlorite	N	N
except Sodium chlorate	R	N
except Sodium hypochlorite	R	N
Stannic chloride	R	R
Stannous chloride	R	R
Starchy	R	R
Stearic acid	R	R
Stoddard solvent	N	N
Succinic acid	R	R
Sulfamic acid	N	N
Sulfate & Sulfite liquors	R	R
Sulfur	R	R
Sugars, aq	R	R
Sulfur dioxide, dry	R	R
Sulfur dioxide, wet	R	N
Sulfur trioxide, gas, dry	R	R
Sulfur acid, wet	R	N
Sulfuric acid, up to 80%	R	R
Sulfuric acid,90 to 93%	R	N
Sulfuric acid, 94 to 100%	N	N
Sulfurous acid	R	R
T		
Tall oil	R	R
Tannic acid	R	R
Tanning liquors	R	R
Tar	N	N
Tartaric acid	R	R
Terpineol	C	C
Tetrachloroethane	C	C
Toluene	N	N

R - Generally Resistant

C - Less resistant than R but still suitable for some conditions

N - Not resistant

CHEMICAL RESISTANCE CHART OF uPVC

Chemical	23°C (73°F)	60°C (140°F)
Tomato juice	R	R
Transformer oil	R	R
Tributyl phosphate	N	N
Tributyl citrate	R	R
Trichloroacetic acid	R	R
Trichloroethylene	R	N
Triethanolamine	R	N
Triethylamine	R	R
Trimethyl propane	R	N
Trisodium phosphate	R	R
Turpentine	R	R
U		
Urea	R	R
Urine	R	R

Chemical	23°C (73°F)	60°C (140°F)
V		
Vaseline	N	N
Vegetable oils	R	R
Vinegar	R	R
Vinyl acetate	N	N
W		
Water, deionized	R	R
Water, distilled	R	R
Water, salt	R	R
White Liquor	R	R
Whiskey	R	R
Wines	R	R
X		
Xylene	N	N
Z		
Zinc salts	R	R

WARRANTY

PRINCE PIPES AND FITTINGS LIMITED warrants to the original owner of the structure in which its Easyfit uPVC Pipe and Fittings have been installed, that the Products will be free from manufacturing defects and conform to applicable standards under normal use. Buyer's remedy for breach of this warranty is limited to replacement of, or credit for, the defective product. This warranty excludes any expense for removal or reinstallation of any defective product and any other incidental, consequential, or punitive damages.

This limited warranty is the only warranty made by seller and is expressly in lieu of all other warranties, express and implied, including any warranties of merchantability and fitness for a particular purpose.

No statement, conduct or description by Prince Pipes or its representative, in addition to or beyond this Limited Warranty, shall constitute a warranty. This Limited Warranty may only be modified in writing signed by an officer of Prince Pipe.

This Limited Warranty will not apply if:

1. The Products are used for purposes other than the transmission of domestic water.
2. The Products are not installed in good and workmanship consistent with normal industry standards; installed in compliance with the latest instructions published by Prince Pipes and good plumbing practices; and installed in conformance with all applicable plumbing and building code requirements.
3. Products of Prince Pipes are used with the products of other manufacturers.
4. The Products fail due to normal wear and tear or deficiencies in design, engineering, or installation of the water distribution system of which they are a part.
5. The Products have been the subject of modification; misuse; misapplication; improper maintenance or repair; damage caused by the fault or negligence of anyone other than Prince Pipe; or any other act or event beyond the control of Prince Pipes.
6. Improper storage, failure to observe the operating instructions, over stressing or overloading, unsuitable operating media, unsuitable construction work or unsuitable building ground.
7. The Products fail due to the freezing of water in the Products.
8. The Products fail due to contact with incompatible material list provided below.
9. Prince Pipe cannot accept responsibility for the performance, dimensional accuracy, or compatibility of pipe, fittings, gaskets, or couplings not manufactured or sold by Prince Pipes.
10. This Limited Warranty will not apply unless written notice of a claim is mailed to Prince Pipes at the address below within 30 days of the day of discovery of the allegedly defective product. Any Prince Pipes products alleged to be defective must be made available to Prince Pipes at the following address for verification, inspection and determination of cause:

    PRINCE PIPES AND FITTINGS LIMITED

    The Ruby, 8th Floor, 29, Senapati Bapat Marg (Tulsi Pipe Road), Dadar (W), Mumbai - 400 028, Maharashtra, India.

Purchaser must obtain a return materials authorization and instructions for return shipment to Prince Pipes of any product claimed defective or shipped in error. Any Prince Pipes product proved to be defective in manufacture will be replaced F.O.C. point of original delivery, or credit will be issued, at the discretion of Prince Pipes.

NOTES:

PRINCE®
PIPING SYSTEMS

PRINCE PIPES AND FITTINGS LIMITED

Mfg. & Exporters of UPVC, CPVC, PPR & HDPE Pipes,
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DISPOSAL OF WASTE & RESIDUES IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS.

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