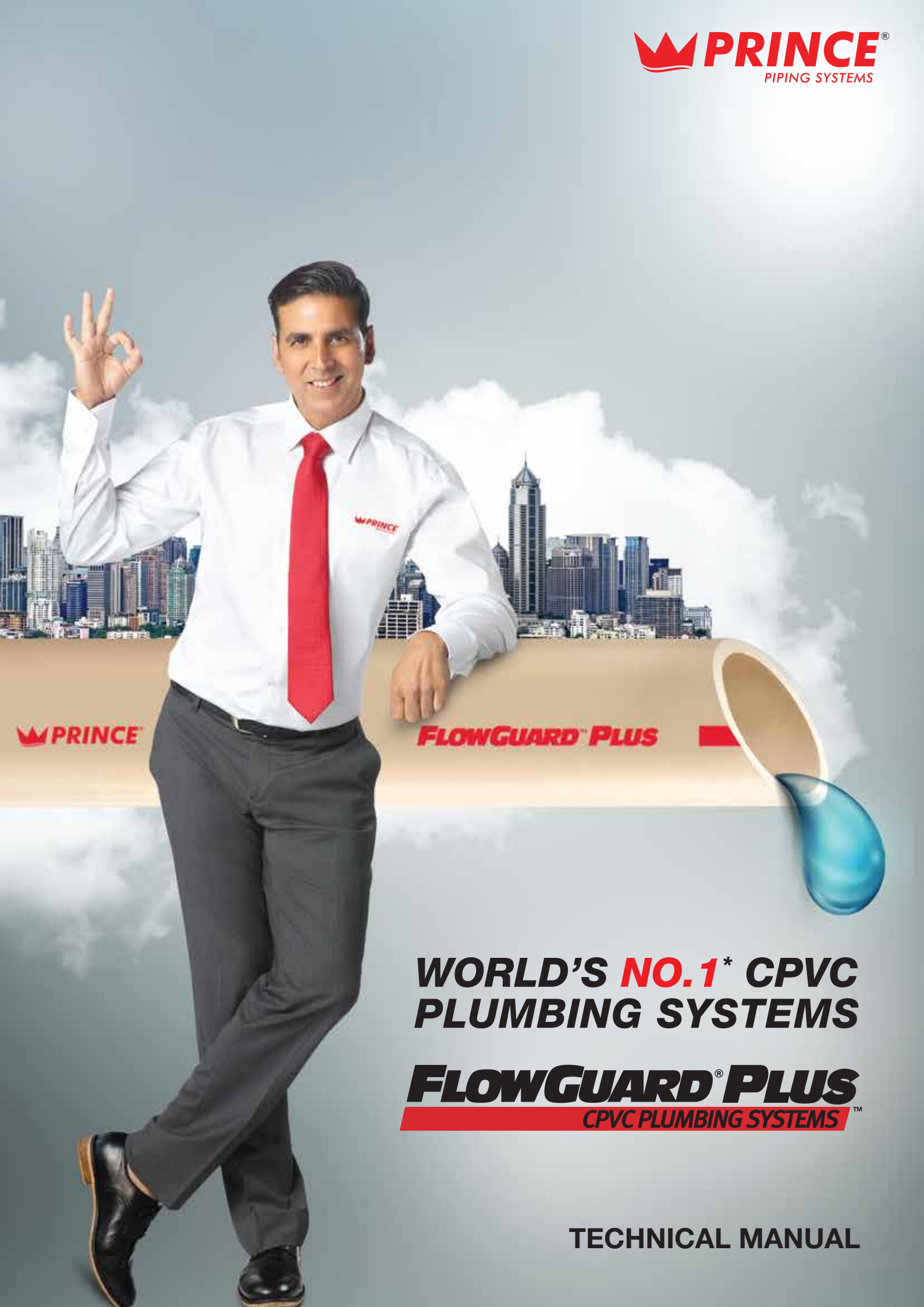
PRINCE®
PIPING SYSTEMS



WORLD'S NO.1* CPVC PLUMBING SYSTEMS

FLOWGUARD® PLUS™
CPVC PLUMBING SYSTEMS

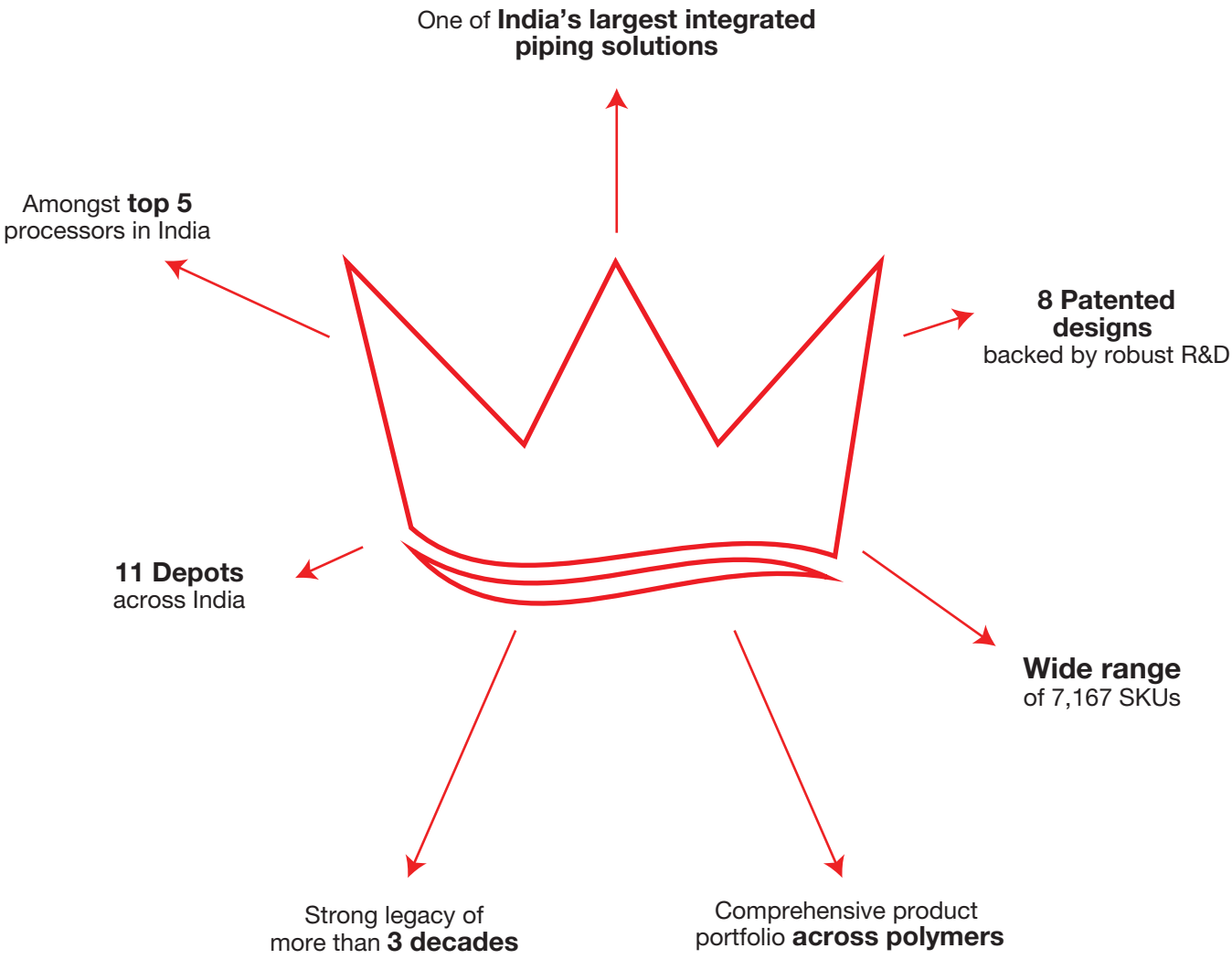
TECHNICAL MANUAL

INDEX

01

02

COMPANY OVERVIEW



RECENTLY VENTURED INTO STORAGE WATER TANKS AND PIPE DUCTING SOLUTIONS

PRINCE STOREFIT™ Paani Ka Bank | CABLEFIT™ CABLE DUCTING PIPES

TECHNICAL COLLABORATION

Tooling holland
A global leader in plastic moulds manufacturing

PRODUCT COLLABORATION

Lubrizol
World's largest manufacturers and also the inventors of CPVC compound

FLOWGUARD® PLUS CPVC PLUMBING SYSTEMS™

STATE-OF-THE-ART MANUFACTURING UNITS

JAIPUR EST. 2019

KOLHAPUR EST. 2012

CHENNAI EST. 2012

HARIDWAR EST. 2008

DADRA EST. 2000

ATHAL EST. 1995

UPCOMING UNIT SANGAREDDY, TELANGANA

CERTIFICATIONS

GRIHA Council

This is to certify that the product of

"LUBRIZOL ADVANCED MATERIALS INDIA PVT LIMITED"

FlowGuard Plus CPVC Pipe
(Ashirvad Pipes Pvt Limited / Prince Pipes & Fittings Limited)
(under typology Innovation)

has been included in the GRIHA Product Catalogue under the following categories:

GRIHA V.3 criterion: 14
GRIHA V.2015 criterion: 31
&
SVAGRIHA criterion: 14

The product can be used in GRIHA & SVAGRIHA registered projects to meet the GRIHA & SVAGRIHA norms, respectively. This is valid only for the product which has been mentioned above.

Sanjay Seth
Chief Executive Officer

Realty+ INEX INTERIOR EXTERIOR EXCELLENCE AWARDS

CO-POWERED BY Inmobel DOORS

INTERIOR & EXTERIOR AWARDS 2021

INEX AWARDS 2021

THIS CERTIFICATE IS PRESENTED TO

Prince Pipes & Fittings Limited

BRAND OF THE YEAR - WATER TECHNOLOGIES - PIPES

In recognition of your exemplary performance and achievement. Your efforts have contributed to making a positive difference in the Indian real estate industry.

DR. ANNURAG BATRA
Chairman & Editor-in-Chief
BW Businessworld & exchange4media Group

FEBRUARY 11, 2021

BSCIC

Certificate

QUALITY MANAGEMENT SYSTEM

PRINCE PIPES AND FITTINGS LTD.

hereby granted the certificate number: BN17702/17383

ISO 9001:2015

Design, Manufacture and Supply of Plastics Piping Systems

BSCIC

Certificate

ENVIRONMENTAL MANAGEMENT SYSTEM

PRINCE PIPES AND FITTINGS LTD.

hereby granted the certificate number: BN17890/17764

ISO 14001:2015

Design and Manufacture of Plastic Piping System

Certificate

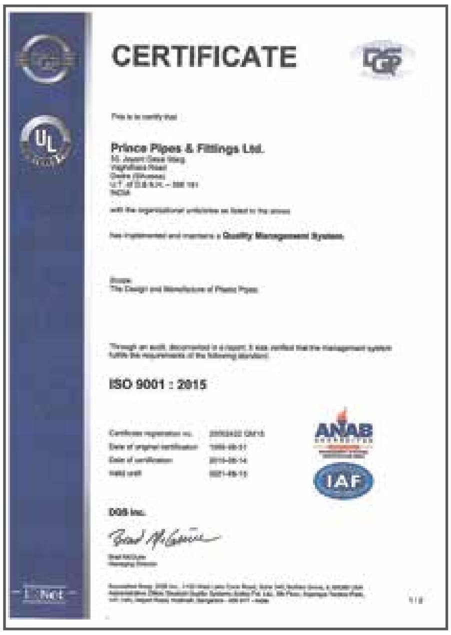
Standard: ISO 50001:2018

Certificate Holder: PRINCE

Prince Pipes and Fittings Ltd.

Scope: Manufacture of uPVC, CPVC, HDPE, PPR Pipes and Fittings

TÜVRheinland



CERTIFICATE

Prince Pipes & Fittings Ltd.

ISO 9001 : 2015

DQS Inc.

Certificate

Standard: ISO 50001:2018

Certificate Registr. No.: 01 407 1836339

Certificate Holder: PRINCE

Prince Pipes and Fittings Ltd

Scope: Manufacture of uPVC Pipes

Certificate

Standard: ISO 50001:2011

Certificate Registr. No.: 01 407 1837547

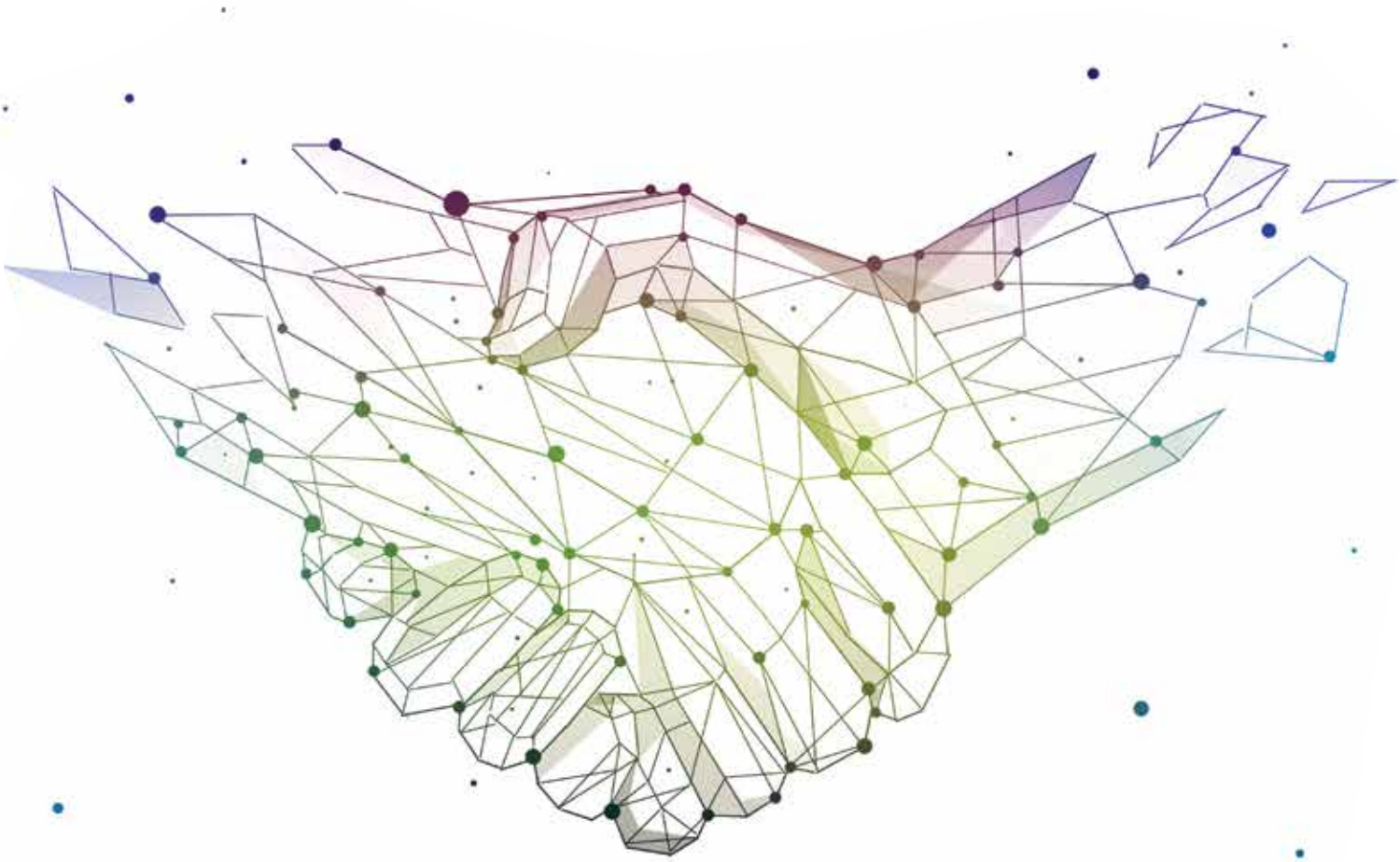
Certificate Holder: PRINCE

Prince Pipes and Fittings Limited

Scope: Manufacture Of uPVC, CPVC, DWC Pipes And Fittings

INNOVATION TO THE NEXT LEVEL
PRINCE PIPES TIES UP WITH TOOLING HOLLAND BV

At Prince Pipes, we believe in non-stop innovation to exceed your expectations. Our technical tie-up with Tooling Holland is another milestone in this journey. Tooling Holland brings over 30 years of proven experience in development and production of injection moulds. Their global skillset will further enhance our technical capabilities and operational efficiency. So you always get world-class products.




FLOWGUARD PLUS
SDR 11

TRUSTED BY THE WORLD, BROUGHT TO YOU BY PRINCE.

Invented in 1959, used all over the world, established as a trusted product and now brought to you by Prince Pipes, FlowGuard Plus CPVC plumbing systems are built to last for generations. Designed for a service life of 50 years, these CPVC pipes and fittings can withstand temperatures up to 93°C and are ideal for hot and cold water applications. But that's not it. FlowGuard Plus advantage means low bacterial growth and therefore, safe and hygienic water. It is fire retardant and does not support combustion. Moreover, it has high tensile strength, 25% better pressure bearing capacity and unparalleled UV resistance. No wonder, it has won so many accreditations and certifications around the world and is hands down,

the world's NO.1* CPVC.

FLOWGUARD® PLUS
CPVC PLUMBING SYSTEMS™

*FlowGuard CPVC is No.1 based on the length of pipes installed.

FEATURES

No Corrosion, Leakage, Scaling and Pitting

Excellent corrosion resistance - prevents contamination, bad taste & odour and water discoloration. Unaffected by the low pH of water, coastal air or corrosive soils.

APPLICATIONS

- Indoor and outdoor installations of hot & cold water plumbing lines
- For concealed, downtake & terrace looping
- Public utilities & swimming pools
- Residential & commercial buildings
- Solar water heaters

Safe for Drinking Water

ADVANTAGES

Approved Compound

Prince FlowGuard Plus CPVC Pipes & Fittings are manufactured from Lubrizol's **NSF/ANSI** 14 certified TEMPRITE® 88619 TAN 311 & TEMPRITE® 88096 TAN 311 CPVC compounds respectively

Suitable for use up to 93°C

High tensile and impact strength

Freedom from toxicity, bad odour & taste

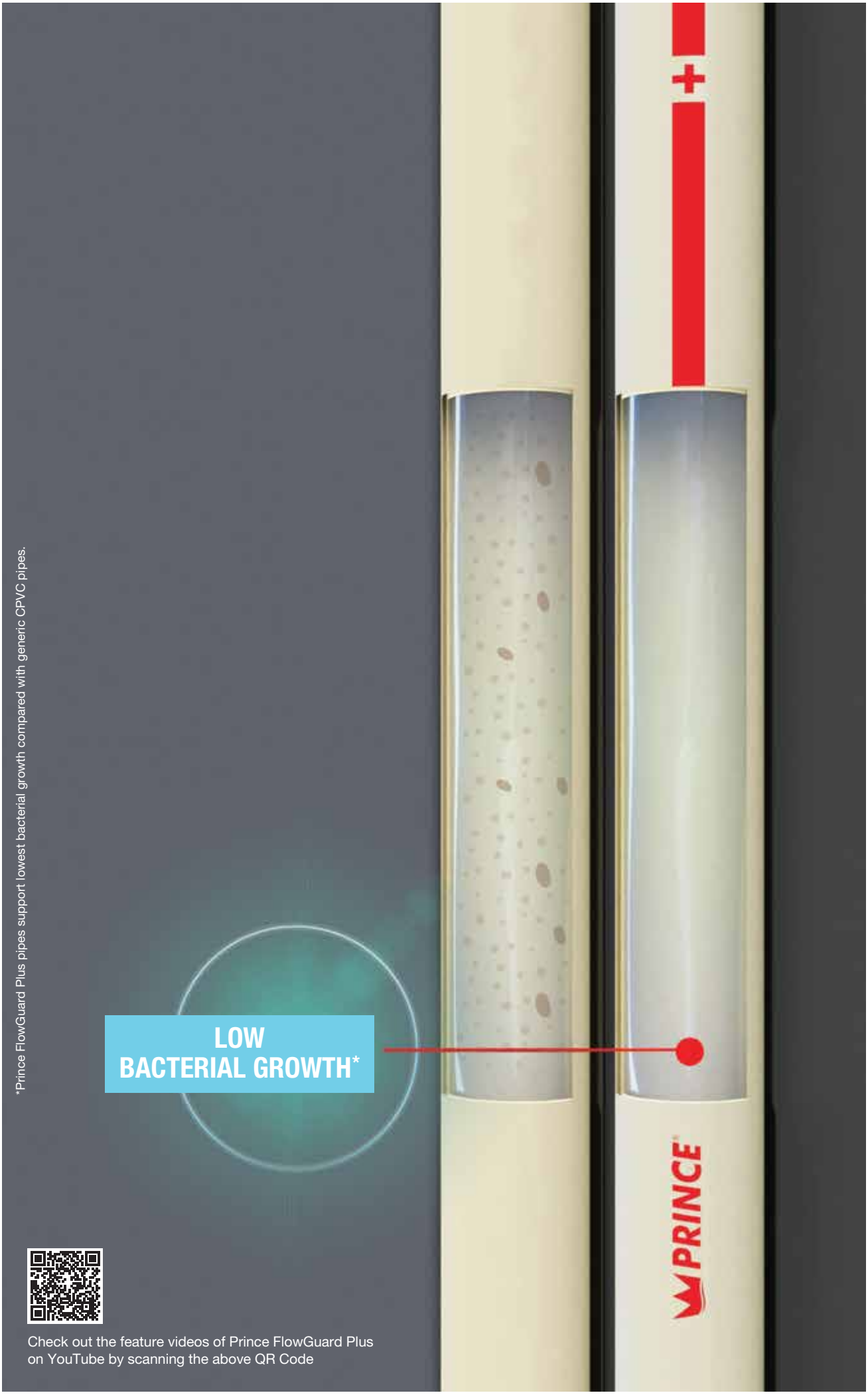
Fire Retardant

Because of high LOI (Limiting Oxygen Index) of 60, it does not propagate fire or support combustion. Once the fire source (flame) is put off, it will self extinguish.

- Low flammability
- Low smoke generation
- Low toxicity

ADVANTAGES

- Low thermal expansion
- UV resistant
- 25% Higher pressure bearing capacity at higher temperatures
- Consistent product quality
- Peace of mind assured



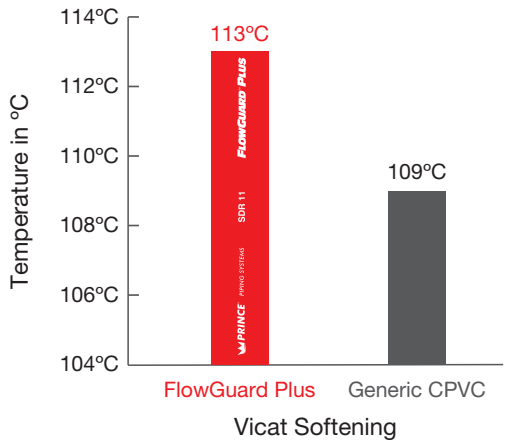
*Prince FlowGuard Plus pipes support lowest bacterial growth compared with generic CPVC pipes.

Check out the feature videos of Prince FlowGuard Plus on YouTube by scanning the above QR Code

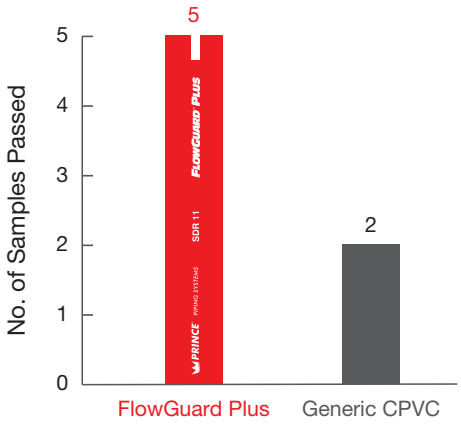
CPVC
THE PREFERRED CHOICE

PROPERTY	PRINCE FLOWGUARD PLUS CPVC	COPPER	GI
Corrosion	High chemical resistance makes it corrosion-free	Over a period of time	Rapid corrosion and deterioration
Scaling, pitting and leaching and full bore flow	Full bore flow, thanks to the absence of scaling, pitting and leaching	Reduced bore flow because of scaling, pitting and leaching	Reduced bore flow because of severe scaling, pitting and leaching
Thermal conductivity	Require reduced insulation as lower thermal conductivity reduces heat loss	Very high - increases heat loss and requires high insulation	Very high thermal conductivity - increases heat loss and requires high insulation
Bacterial growth	Extremely low	Higher than CPVC	Higher than copper
Fire resistance	High LOI of 60 makes it fire-retardant unless exposed to an external fire source continuously	Better fire resistance, copper being a metal	Being metallic, offers better fire resistance
Installation	Quick, easy and cost-effective - through cold welding. No electricity or heat source required.	Highly skilled manpower required to install. Also needs electricity/ heat source	Complicated and very slow. Requires more man hours.
Leakage	Long life leak-free piping systems (Installation to be done as per manual)	If carried out by highly trained manpower, gives a leak-free performance	Highly susceptible to leakage from the time of installation
Thermal expansion	More thermal expansion than metal yet the stress induced is relatively lower	Thermal expansion is lower yet the stress induced is far greater	Lower thermal expansion but the stress induced is far greater
Range of fittings	Preferred choice of architects, consultants, builders and end users as the wide range ensures the layout is compact as well as easy	Involves frequent cutting or welding to achieve the desired layout as the range of fittings is very limited	Limited range of fittings

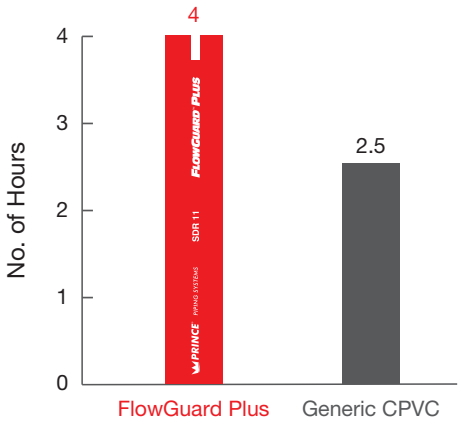
THE 'PLUS' IN PRINCE FLOWGUARD PLUS



Vicat Softening



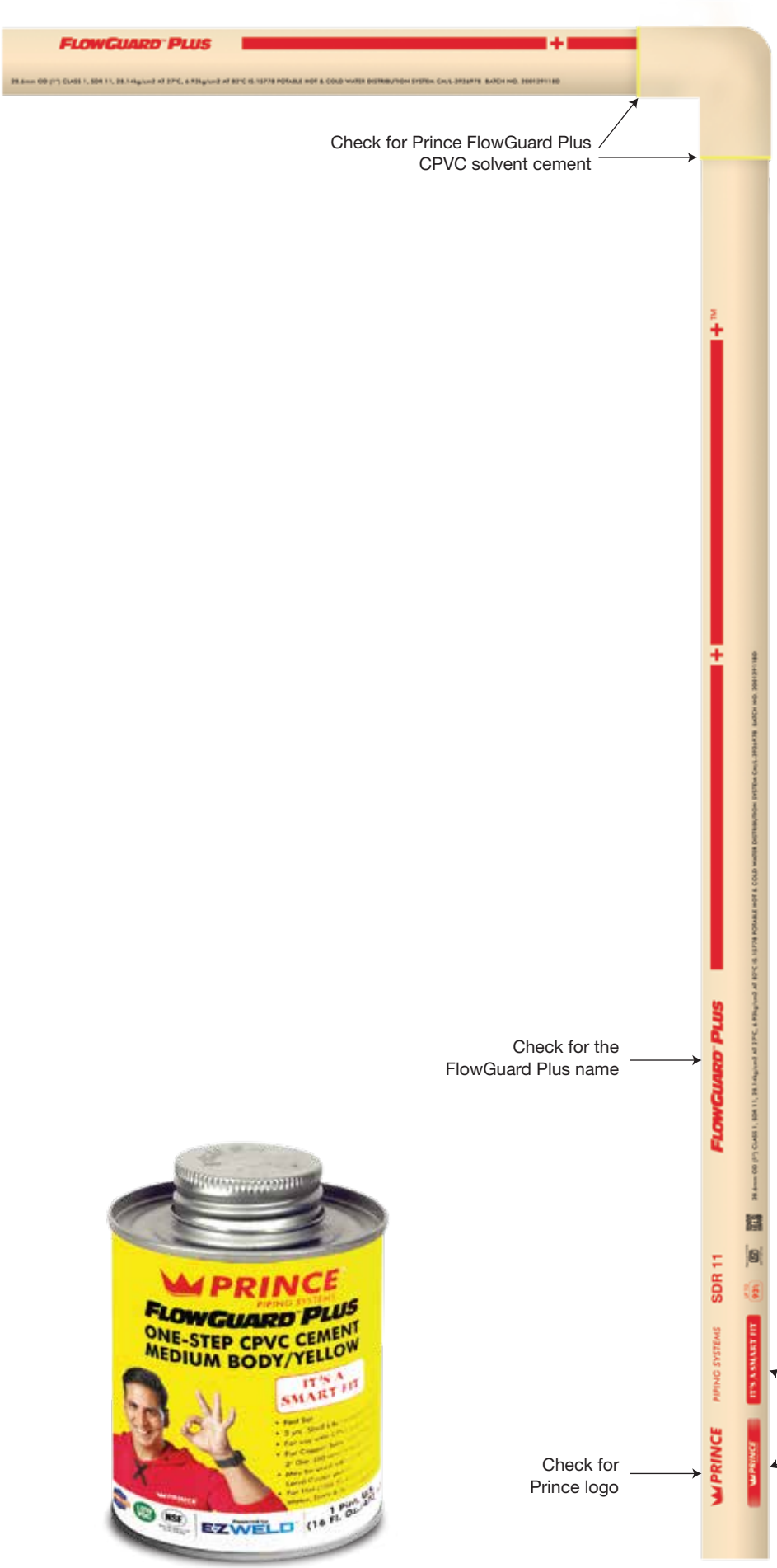
100% Flattening Test



Sustained Pressure Test at 82°C

FACTOR	PRINCE FLOWGUARD PLUS CPVC	GENERIC CPVC
Compound credibility	Inventors of CPVC compound.	New and unproven.
Assembly	Complete system of Prince FlowGuard Plus (Pipes, Fittings & Solvent Cements).	Different sources for making the system complete.
Market reach	Highest number of projects in India.	Piggybacking the success of FlowGuard to capture market.
Material strength	Withstands test duration of 4 hours (Sustained Pressure Test as per ASTM) assuring long life.	Fails before the test duration of 4 Hours, meaning higher probability of failure.
Durability	No cracks or damage observed, ensuring better quality of compound.	Gets damaged easily, questionable quality of compound.
Pressure rating	Higher HDB compounds result in 25% higher pressure rating at elevated temperatures.	Normal compound means no additional pressure rating.
Quality consistency	Finished products manufactured exclusively by our global network of select manufacturing partners to ensure product quality and consistency.	Multiple manufacturers. Raw material from different sources.
Popularity	All top ten national builders specify our technology by name. Leader in testing and code acceptance efforts.	No national specification. Limited code support.
Standard	All compounds and finished goods produced to one standard. Quality Assurance Program helps ensure that only the highest quality CPVC finished goods are delivered to the marketplace.	Multiple formulation processes from raw material to the finished product.
Safety	Product manufactured with a safety factor of 2.0. Designed & manufactured for a service life of 50 years (Time Tested).	No history of the product & no mention of safety factor by manufacturers.

PRINCE FLOWGUARD PLUS IDENTITY



STANDARDS AND CODES

STANDARDS FOR PIPES AND FITTINGS

Prince FlowGuard Plus CPVC pipes and fittings are manufactured in sizes from ½" to 6".

Class of Pipe	Standard	Sizes Available	Class of Fitting	Standard	Sizes Available
Class-1 / SDR 11 Pipe	IS 15778 : 2007	½" - 2"	SDR 11 Fittings	ASTM D 2846 : 2011	½" - 2"
Class-2 / SDR 13.5 Pipe	IS 15778 : 2007	½" - 2"	-	-	-
SCH 40 Pipe	ASTM F 441 : 2013	2½" - 10"	SCH 40 Fittings	ASTM F 438 : 2009	2½" - 6"
SCH 80 Pipe	ASTM F 441 : 2013	2½" - 10"	SCH 80 Fittings	ASTM F 439 : 2013	2½" - 4"

COLOUR CODING OF PIPES AND FITTINGS

Prince FlowGuard Plus CPVC pipes and fittings can be easily distinguished by the manufacturer's trademark and appropriate colour coding on the product.

Class of Pipe	Colour	Class of Fitting	Colour
Class-1 / SDR 11 PIPE	Tan red stripe	SDR 11 FITTINGS	Tan
Class-2 / SDR 13.5 PIPE	Tan brown stripe	SDR 11 FITTINGS	Tan
SCH 40 PIPE	Tan brown stripe	SCH 40 FITTINGS	Tan
SCH 80 PIPE	Tan red stripe	SCH 80 FITTINGS	Tan

BASIC PROPERTIES OF PRINCE FLOWGUARD PLUS CPVC

Sl.No.	Property	Test	Condition	English Units	S.I. Units
GENERAL					
1	Specific Gravity	ASTM D792	73°F/23°C	1.50 - 1.53	1.50 - 1.53
2	Specific Volume	-	73°F/23°C	0.645 cm^3/g	0.645 cm^3/g
3	Water Absorption	ASTM D570	73°F/23°C 212°F/100°C	0.03% 0.55%	0.03% 0.55%
4	Rockwell Hardness	ASTM D785	73°F/23°C	119	-
5	Cell Classification	ASTM D1784	-	23447	-
MECHANICAL					
1	Izod Impact	ASTM D256	73°F/23°C	1.5 ft lbs/in. o.n	80 J/m o.n
2	Tensile Strength	ASTM D638	73°F/23°C	8000 psi	55 N/mm^2
3	Tensile Modulus	ASTM D638	73°F/23°C	360,000 psi	2500 N/mm^2
4	Flexural Strength	ASTM D790	73°F/23°C	15,100 psi	104 N/mm^2
5	Flexural Modulus	ASTM D790	73°F/23°C	415,000 psi	2860 N/mm^2
6	Compressive Strength	ASTM D695	73°F/23°C	10,100 psi	70 N/mm^2
7	Compressive Modulus	ASTM D695	73°F/23°C	196,000 psi	1350 N/mm^2
THERMAL PROPERTIES					
1	Coefficient of Thermal Expansion	ASTM D696	-	3.4x10-5 in/in/°F	6.1x10-5 m/m/K
2	Thermal Conductivity	ASTM C177	-	0.95 BTU in/hr/ft^2/°F	0.14 Wm/K/m^2
3	Heat Distortion Temperature	ASTM D648	-	217°F	103 Watt/m/°K
4	Heat Capacity	DSC	73°F/23°C 212°F/100°C	0.21 BTU/lb°F 0.26 BTU/lb°F	0.90 J/gK 1.10 J/gK
FLAMMABILITY					
1	Flammability Rating	UL94 | Euroclass (EN 13501-1) B-s1 d0	-	0.062 in/0.157cm	V-0, 5VB, 5VA
2	Flame Spread	ASTM E84	-	15	
3	Smoke Developed	ASTM E84	-	70-125	-
4	Limiting Oxygen Index	ASTM D2863	-	60%	-
ELECTRICAL					
1	Dielectric Strength	ASTM D147	-	1250 V/mil	492,000 V/cm
2	Dielectric Constant	ASTM D149	60 Hz, 30°F/-1°C	3.7	3.7
3	Power Factor	ASTM D150	1000 Hz	0.007%	0.007%
4	Volume Resistivity	ASTM D257	73°F/23°C	3.4x10^{15}ohm/cm	3.4x10^{15}ohm/cm

PRODUCT RANGE

• **Pipes:** 1/2 to 10 inches • **Fittings:** 1/2 to 6 inches

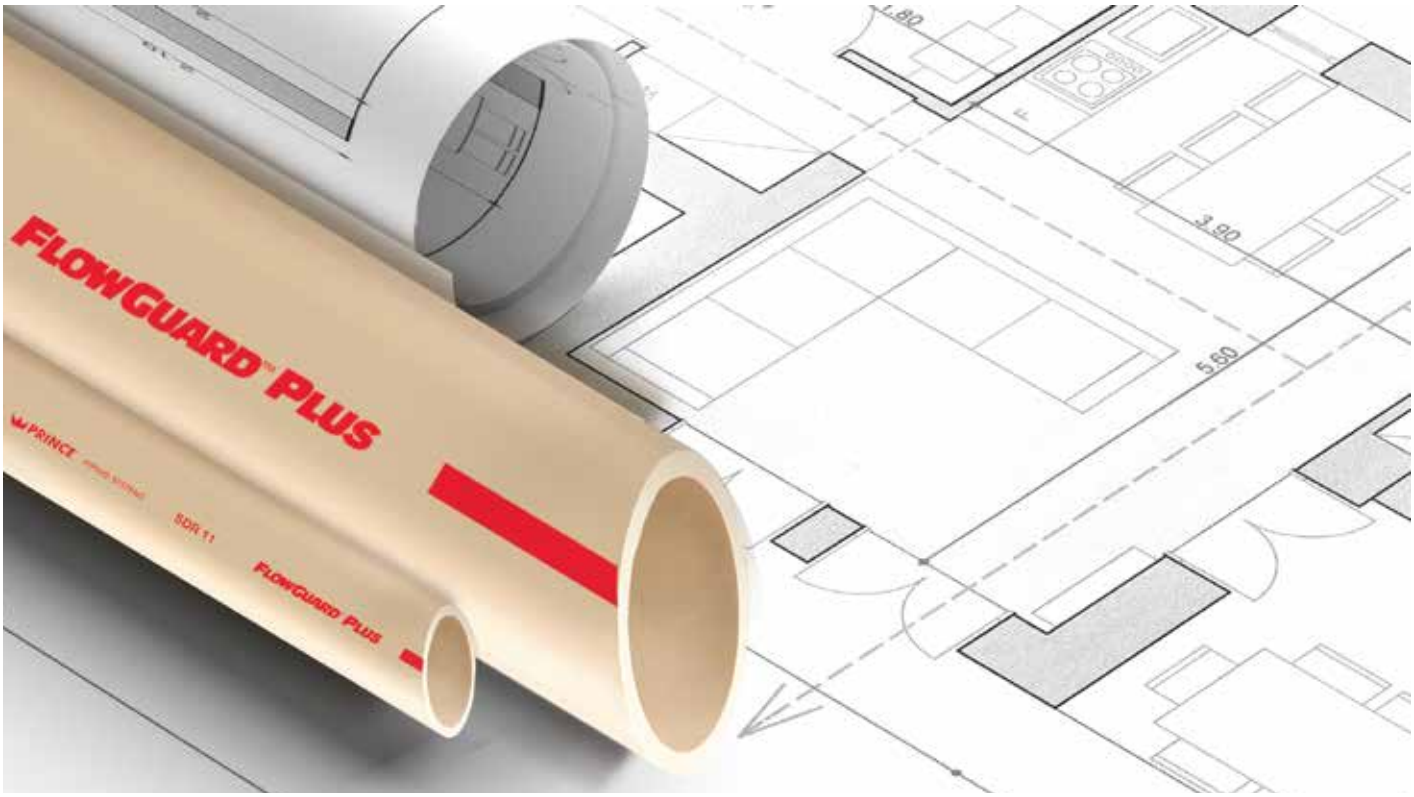
PIPE DIMENSIONS

Prince FlowGuard Plus CPVC has 25% higher pressure bearing capacity at higher temperatures

Nominal Bore		Outside Diameter		SDR-11				SDR-13.5			
				Wall Thickness		Working Pressure		Wall Thickness		Working Pressure	
		Min	Max	Min	Max	At 27°C	At 82°C	Min	Max	At 27°C	At 82°C
(mm)	(inches)	(mm)	(mm)	(mm)	(mm)	(kg/cm^2)	(kg/cm^2)	(mm)	(mm)	(kg/cm^2)	(kg/cm^2)
15	1/2	15.80	16.00	1.70*	2.20*	28.14	6.93	1.40*	1.90*	22.22	5.60
20	3/4	22.10	22.30	2.00	2.50	28.14	6.93	1.70	2.20	22.22	5.60
25	1	28.50	28.70	2.60	3.10	28.14	6.93	2.10	2.60	22.22	5.60
32	1 ¼	34.80	35.00	3.20	3.70	28.14	6.93	2.60	3.10	22.22	5.60
40	1 ½	41.20	41.40	3.80	4.30	28.14	6.93	3.10	3.60	22.22	5.60
50	2	53.90	54.10	4.90	5.50	28.14	6.93	4.00	4.60	22.22	5.60

Nominal Bore		Outside Diameter	Schedule 40				Schedule 80			
			Wall Thickness		Working Pressure		Wall Thickness		Working Pressure	
			Min	Max	At 27°C	At 82°C	Min	Max	At 27°C	At 82°C
(mm)	(inches)	(mm)	(mm)	(mm)	(kg/cm^2)	(kg/cm^2)	(mm)	(mm)	(kg/cm^2)	(kg/cm^2)
65	2 ½	73.00 (+/- 0.18)	5.16	5.77	21.10	5.30	7.01	7.85	29.57	7.34
80	3	88.90 (+/- 0.20)	5.49	6.15	18.25	4.58	7.62	8.53	26.00	6.32
100	4	114.30 (+/- 0.23)	6.02	6.73	15.49	3.87	8.56	9.58	22.53	5.60
150	6	168.30 (+/- 0.28)	7.11	7.97	12.64	3.16	10.97	12.29	19.68	4.89
200	8	219.10 (+/- 0.38)	8.18	9.17	11.21	2.85	12.70	14.22	17.54	4.18
250	10	273.10 (+/- 0.38)	9.27	10.39	9.89	2.44	15.06	16.86	16.21	3.87

Note:
- *Dimensions with '*' are not a function of SDR*
- *Fittings are suitable for corresponding pipe pressure ratings*



PIPE DERATING FACTOR

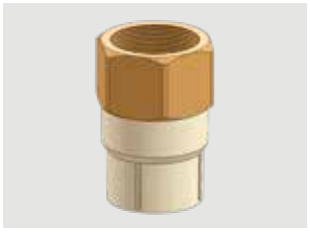
Prince FlowGuard Plus CPVC Plumbing Systems' ability to perform even at increased temperatures gives them a better derating factor. Another reason why FlowGuard Plus CPVC Plumbing Systems come with a promise of 50 years of life.

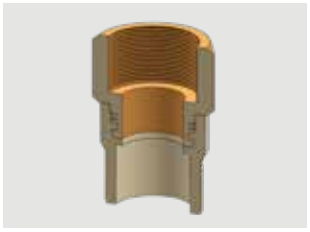
Working Temperature		Pipe Derating Factor	
°F	°C	FlowGuard Plus	Generic CPVC
73 - 80	23 - 27	1.00	1.00
90	32	0.91	0.91
100	38	0.83	0.82
120	49	0.70	0.65
140	60	0.57	0.50
160	71	0.44	0.40
180	82	0.31	0.25

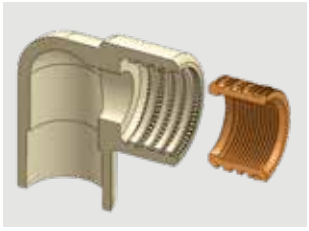
PRINCE FLOWGUARD PLUS FITTINGS
PERFECT FIT ADVANTAGES

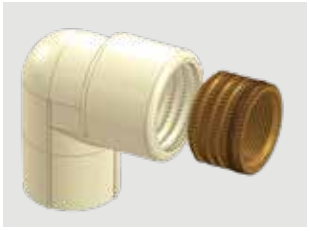
Female Threaded Adaptor (Heavy Brass Insert)

- Hex type heavy design inserts, which can tolerate heavy torque. Special quality brass material ensures long service life of threads.
- O-ring made of EPDM used with brass inserts for avoiding leakage.
- Knurling provided for inserts for firm gripping with CPVC material during moulding process, which ensures high torque.







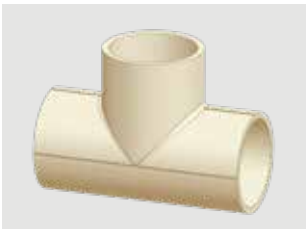


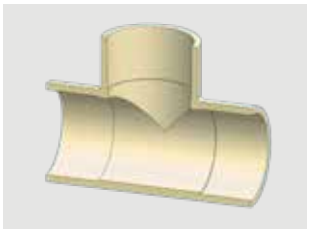
Female Threaded Elbow (Brass Insert)

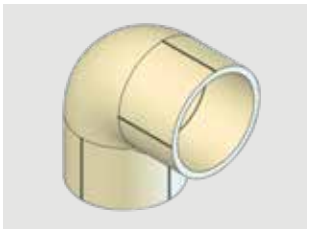
- Hex type heavy design inserts, which can tolerate heavy torque. Special quality brass material ensures long service life of threads.
- O-ring made of EPDM used with brass inserts for avoiding leakage.
- Knurling provided for inserts for firm gripping with CPVC material during moulding process, which ensures high torque.

Tee 2 ½"/3" & 4"

- Ribs provided for plumbing alignment





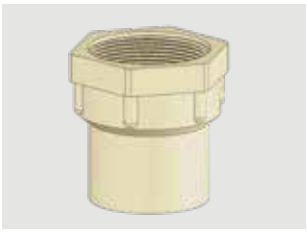


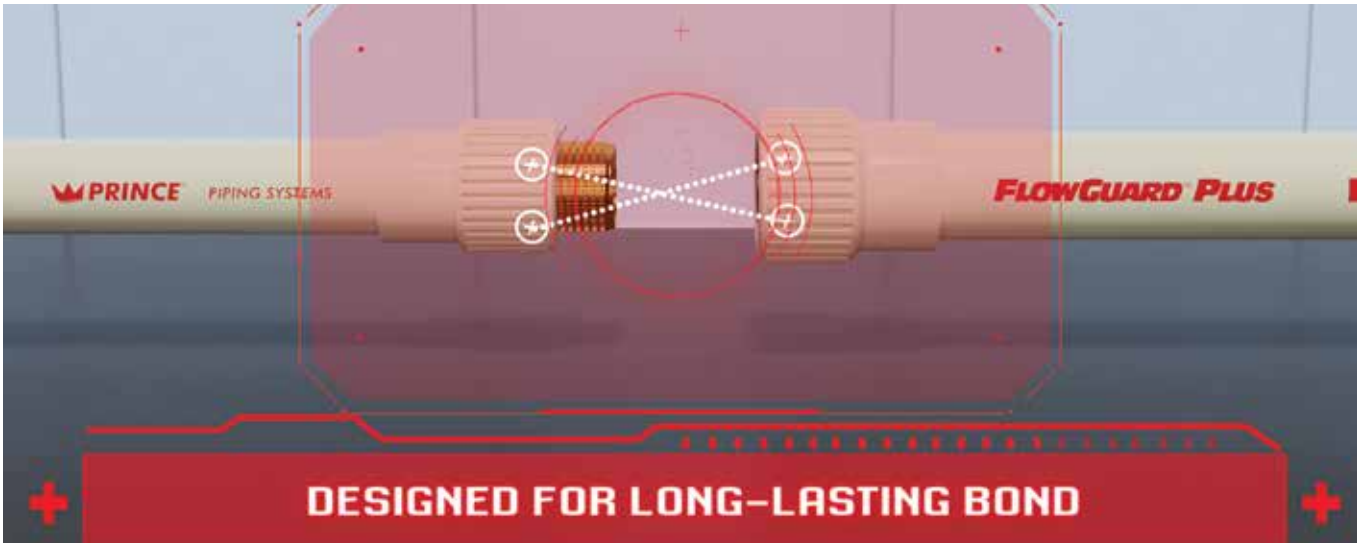
Elbow 2 ½"/3" & 4"

- Ribs provided for plumbing alignment

Female Threaded Adaptor

- Ribs provided near hex portion for a firm wrench grip to provide strength to female threaded adaptor





FITTINGS DIMENSIONS

COUPLER (SDR 11)

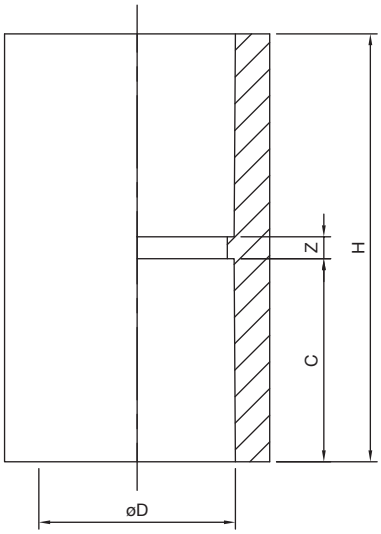
Size (mm)	Size (inch)	ØD	C	Z	H
15	1/2	15.90	12.70	2.60	28.00
20	3/4	22.20	17.80	2.60	38.20
25	1	28.60	22.90	2.60	48.40
32	1 1/4	34.90	27.95	2.60	58.50
40	1 1/2	41.30	33.05	2.60	68.70
50	2	54.00	43.20	2.60	89.00

COUPLER (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	H
65	2 1/2	73.00	44.45	4.80	93.70
80	3	88.90	47.65	4.80	100.10
100	4	114.30	57.15	4.80	119.10

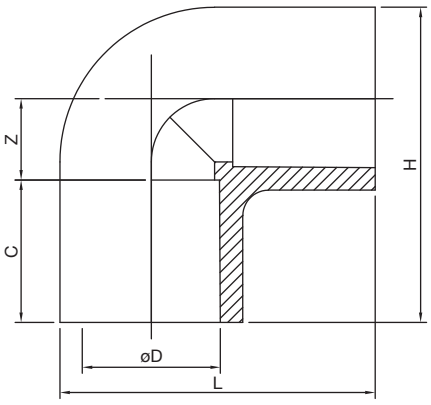
COUPLER (SCH 40)

Size (mm)	Size (inch)	ØD	C	Z	H
65	2 1/2	73.00	45.00	5.00	95.00
80	3	88.90	48.00	5.80	101.80
100	4	114.30	55.00	7.00	117.00
150	6	168.30	77.00	6.20	160.20



ELBOW (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	H & L
15	1/2	15.90	12.70	9.70	32.60
20	3/4	22.20	17.80	12.90	44.75
25	1	28.60	22.90	16.10	56.45
32	1 1/4	34.90	27.95	19.25	68.40
40	1 1/2	41.30	33.05	22.45	80.55
50	2	54.00	43.20	28.85	104.55

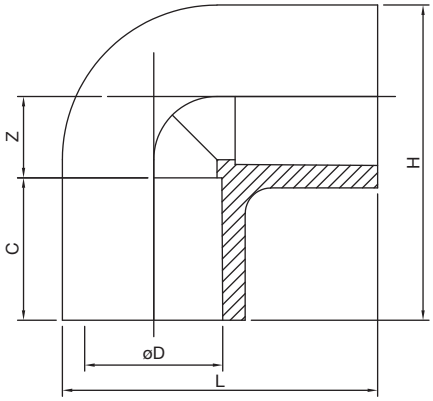


ELBOW (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	H & L
65	2 1/2	73.00	44.45	38.10	127.25
80	3	88.90	47.65	46.05	146.95
100	4	114.30	57.15	58.75	182.85

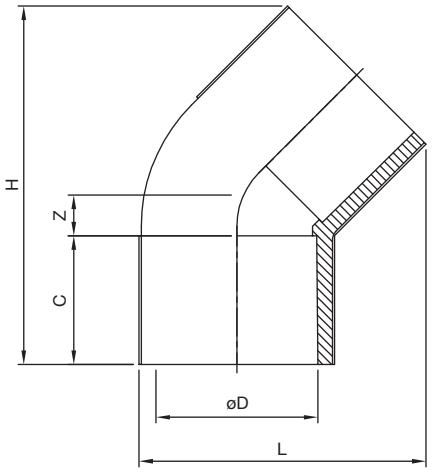
ELBOW (SCH 40)

Size (mm)	Size (inch)	ØD	C	Z	H & L
65	2 1/2	73.00	45.00	41.50	128.35
80	3	88.90	48.00	49.50	147.65
100	4	114.30	55.00	58.75	184.40
150	6	168.30	77.00	89.50	258.15



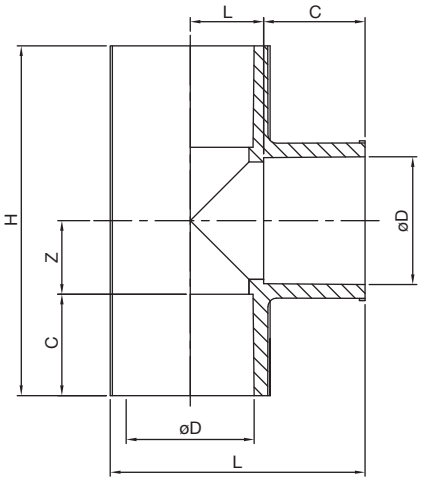
ELBOW 45° (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	H	L
15	1/2	15.90	12.70	4.65	36.85	29.70
20	3/4	22.20	17.80	6.00	50.55	40.75
25	1	28.60	22.90	7.30	63.90	51.10
32	1 1/4	34.90	27.95	8.65	77.55	62.35
40	1 1/2	41.30	33.05	9.95	91.10	73.15
50	2	54.00	43.20	12.60	118.25	94.95



TEE (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	H	L
15	1/2	15.90	12.70	9.70	44.80	32.60
20	3/4	22.20	17.80	12.90	61.40	44.75
25	1	28.60	22.90	16.10	78.00	56.45
32	1 1/4	34.90	27.95	19.25	94.40	68.40
40	1 1/2	41.30	33.05	22.45	111.00	80.55
50	2	54.00	43.20	28.85	144.10	104.55

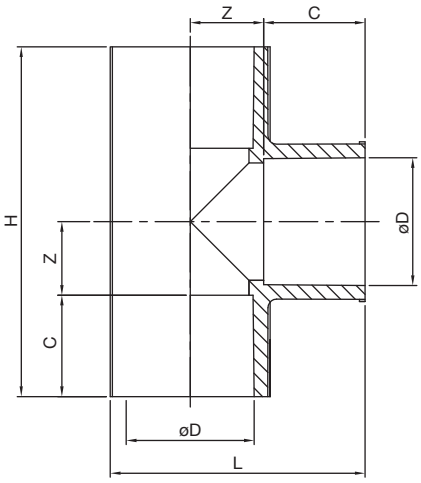


TEE (SCH 80)

Size (mm)	Size (inch)	ØD	C	Z	H	L
65	2 1/2	73.00	44.45	38.10	165.10	127.25
80	3	88.90	47.65	46.05	187.40	146.95
100	4	114.30	57.15	58.75	231.80	182.85

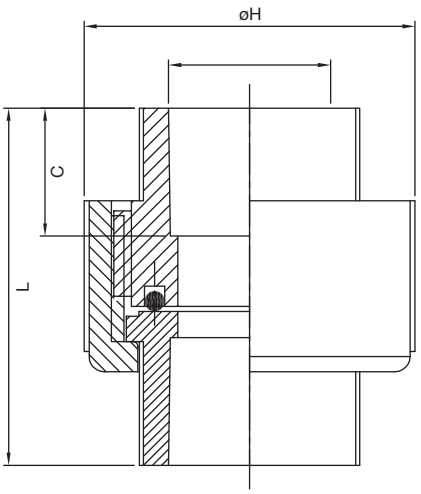
TEE (SCH 40)

Size (mm)	Size (inch)	ØD	C	Z	H	L
65	2 1/2	73.00	45.00	44.00	178.00	130.85
80	3	88.90	48.00	51.50	199.00	149.65
100	4	114.30	55.00	67.00	244.00	185.40
150	6	168.30	77.00	89.50	333.00	258.15



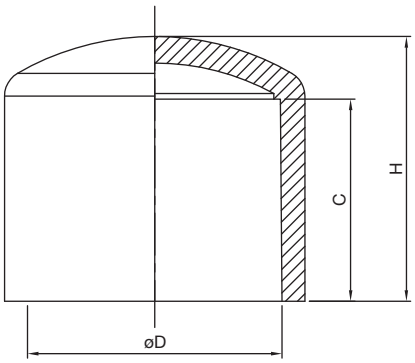
UNION (SDR 11)

Size (mm)	Size (inch)	ØD	C	ØH	L
15	1/2	15.90	12.70	32.60	35.50
20	3/4	22.20	17.80	44.80	46.80
25	1	28.60	22.90	53.90	58.00
32	1 1/4	34.90	27.95	64.50	70.55
40	1 1/2	41.30	33.05	78.50	80.45
50	2	54.00	43.20	91.50	102.00



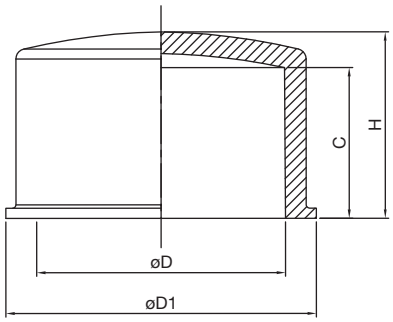
END CAP (SDR 11)

Size (mm)	Size (inch)	ØD	C	H
15	1/2	15.90	12.70	18.00
20	3/4	22.20	17.80	25.00
25	1	28.60	22.90	30.00
32	1 1/4	34.90	27.95	37.00
40	1 1/2	41.30	33.05	42.50
50	2	54.00	43.20	55.50



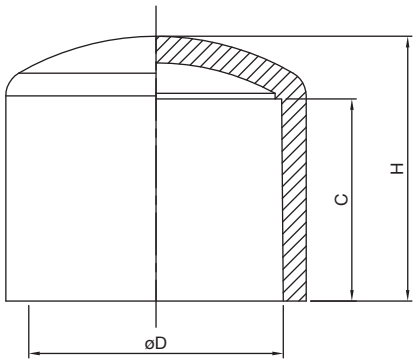
END CAP (COLLAR TYPE) (SCH 80)

Size (mm)	Size (inch)	ØD	ØD1	C	H
65	2 1/2	73.00	91.60	44.45	55.00
80	3	88.90	108.10	47.65	60.00
100	4	114.30	136.65	57.15	71.00



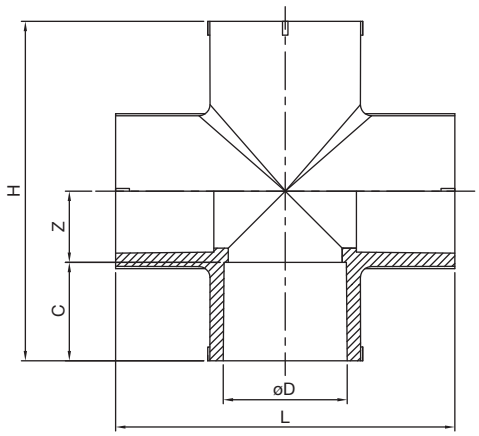
END CAP (SCH 40)

Size (mm)	Size (inch)	ØD	C	H
150	6	168.30	77.00	101.00



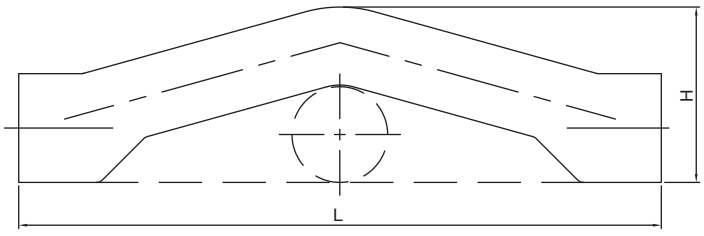
FOUR WAY TEE (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	H & L
15	1/2	15.90	12.70	9.70	44.80
20	3/4	22.20	17.80	12.90	61.40



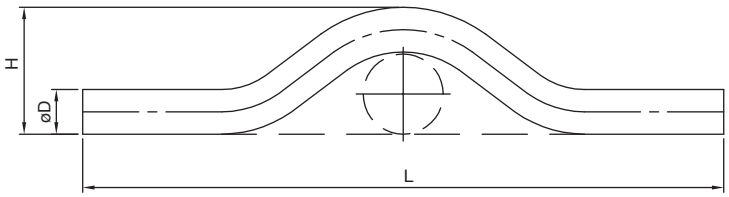
CROSS OVER (MOULDED) (SDR 11)

Size (mm)	Size (inch)	H	L
20	3/4	52.40	192.00
25	1	64.00	252.80



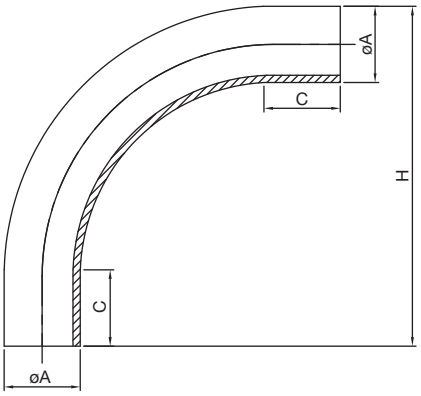
CROSS OVER (FABRICATED) (SDR 11)

Size (mm)	Size (inch)	ØD	H	L
15	1/2	15.90	45.75	229.00
20	3/4	22.20	48.80	251.00
25	1	28.60	58.00	339.00



FABRICATED BEND (SDR 11) New

Size (mm)	Size (inch)	ØA	C	H
15	1/2	15.90	73.00	124.00
20	3/4	22.20	65.00	130.00
25	1	28.60	60.00	150.00
32	1 1/4	34.90	70.00	161.00
40	1 1/2	41.30	65.00	171.00
50	2	54.00	55.00	193.00

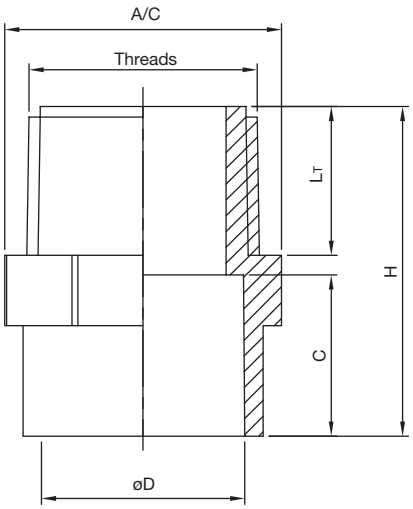


MALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	LT	H	A/C
15	1/2	15.90	12.70	1/2" (14-TPI)	17.00	32.30	24.50
20	3/4	22.20	17.80	3/4" (14-TPI)	16.50	36.90	30.95
25	1	28.60	22.90	1" (11-TPI)	21.10	46.80	39.30
32	1 1/4	34.90	27.95	1 1/4" (11-TPI)	23.15	54.50	48.50
40	1 1/2	41.30	33.05	1 1/2" (11-TPI)	24.60	61.75	56.95
50	2	54.00	43.20	2" (11-TPI)	26.00	74.40	74.15

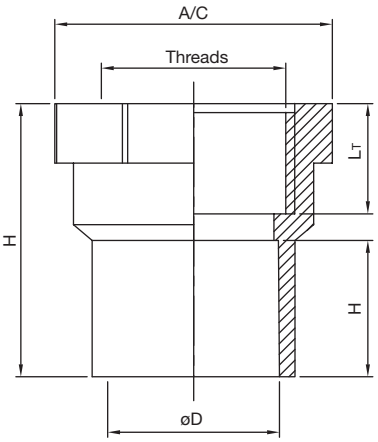
MALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	LT	H	A/C
65	2 1/2	73.00	44.45	2 1/2" (11-TPI)	29.00	79.50	100.30
80	3	88.90	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



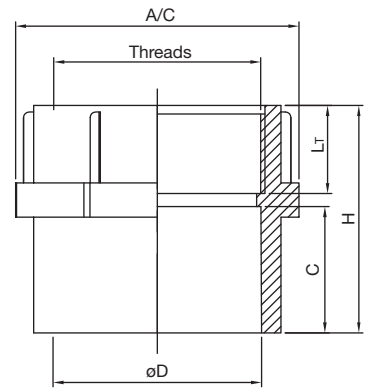
FEMALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
15	1/2	15.90	12.70	1/2” (14-TPI)	15.30	32.50	30.60
20	3/4	22.20	17.80	3/4” (14-TPI)	15.75	38.05	37.20
25	1	28.60	22.90	1” (11-TPI)	18.50	45.90	46.60
32	1 1/4	34.90	27.95	1 1/4” (11-TPI)	20.80	53.75	57.15
40	1 1/2	41.30	33.05	1 1/2” (11-TPI)	22.10	60.15	64.20
50	2	54.00	43.20	2” (11-TPI)	23.40	71.60	80.25



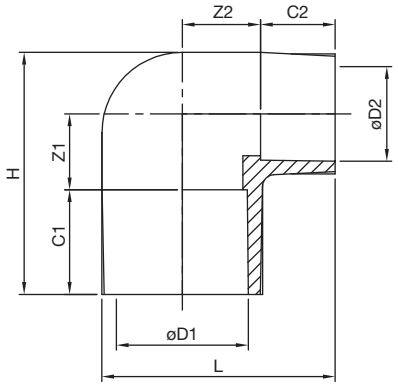
FEMALE THREADED ADAPTOR (SCH 80)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
65	2 1/2	73.00	44.45	2 1/2” (11-TPI)	31.00	80.00	99.70
80	3	88.90	47.65	3” (11-TPI)	34.00	86.00	119.00
100	4	114.30	57.15	4” (11-TPI)	40.00	102.00	149.65



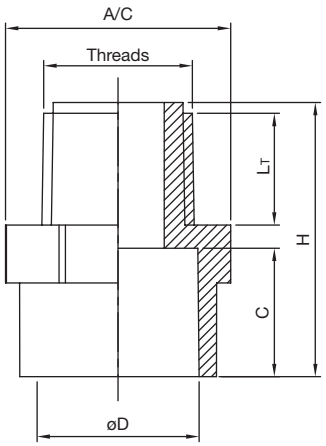
REDUCING ELBOW (SDR 11)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z1	Z2	H	L
20 X 15	3/4 X 1/2	22.20	15.90	17.80	12.70	12.90	13.30	41.15	39.70
25 X 20	1 X 3/4	28.60	22.20	22.90	17.80	17.10	16.20	55.00	51.60



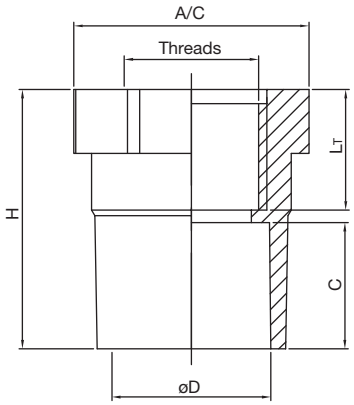
REDUCING MALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
20 X 15	3/4 X 1/2	22.20	17.80	1/2” (14-TPI)	17.00	38.00	31.20
25 X 20	1 X 3/4	28.60	22.90	3/4” (14-TPI)	16.50	42.60	39.00



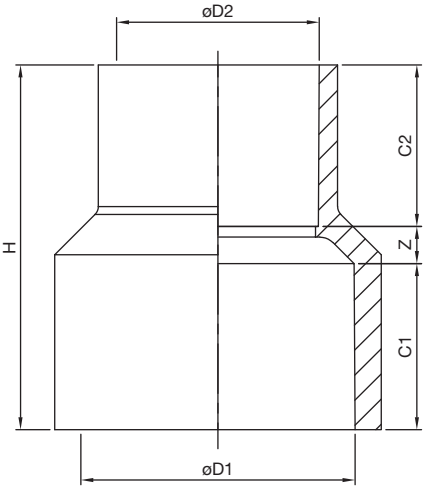
REDUCING FEMALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	L_T	H	A/C
20 X 15	3/4 X 1/2	22.20	17.80	1/2" (14-TPI)	17.00	36.60	33.20



REDUCER (SDR 11)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z	H
20 X 15	3/4 X 1/2	22.20	15.90	17.80	12.70	2.60	33.10
25 X 15	1 X 1/2	28.60	15.90	22.90	12.70	2.60	38.20
25 X 20	1 X 3/4	28.60	22.20	22.90	17.80	2.60	43.30
32 X 15	1 1/4 X 1/2	34.90	15.90	27.95	12.70	2.60	43.25
32 X 20	1 1/4 X 3/4	34.90	22.20	27.95	17.80	2.60	48.35
32 X 25	1 1/4 X 1	34.90	28.60	27.95	22.90	2.60	53.45
40 X 15	1 1/2 X 1/2	41.30	15.90	33.05	12.70	2.60	48.35
40 X 20	1 1/2 X 3/4	41.30	22.20	33.05	17.80	2.60	53.45
40 X 25	1 1/2 X 1	41.30	28.60	33.05	22.90	2.60	58.55
40 X 32	1 1/2 X 1 1/4	41.30	34.90	33.05	27.95	2.60	63.60
50 X 15	2 X 1/2	54.00	15.90	43.20	12.70	2.60	58.50
50 X 20	2 X 3/4	54.00	22.20	43.20	17.80	2.60	63.60
50 X 25	2 X 1	54.00	28.60	43.20	22.90	2.60	68.70
50 X 32	2 X 1 1/4	54.00	34.90	43.20	27.95	2.60	73.75
50 X 40	2 X 1 1/2	54.00	41.30	43.20	33.05	2.60	78.85



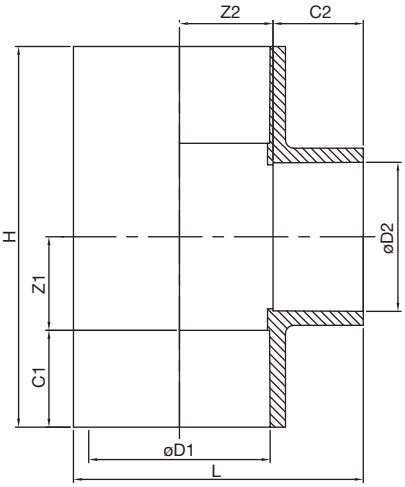
REDUCER (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z	H
65 X 50*	2 1/2 X 2	73.00	54.00	44.45	43.20	9.95	97.60
80 X 50*	3 X 2	88.90	54.00	47.65	43.20	15.15	106.00
80 X 65	3 X 2 1/2	88.90	73.00	47.65	44.45	13.90	106.00
100 X 50*	4 X 2	114.30	54.00	57.15	43.20	35.65	136.00
100 X 65	4 X 2 1/2	114.30	73.00	57.15	44.45	26.40	128.00
100 X 80	4 X 3	114.30	88.90	57.15	47.65	18.70	123.50

*Not in Schedule 80

REDUCING TEE (SDR 11)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z1	Z2	H	L
20 X 15	3/4 X 1/2	22.20	15.90	17.80	12.70	9.70	12.90	55.00	39.25
25 X 15	1 X 1/2	28.60	15.90	22.90	12.70	12.90	16.10	71.60	46.25
25 X 20	1 X 3/4	28.60	22.20	22.90	17.80	12.90	16.10	71.60	51.35
32 X 15	1 1/4 X 1/2	34.90	15.90	27.95	12.70	16.10	19.25	88.10	53.15
32 X 20	1 1/4 X 3/4	34.90	22.20	27.95	17.80	16.10	19.25	88.10	58.25
32 X 25	1 1/4 X 1	34.90	28.60	27.95	22.90	16.10	19.25	88.10	63.35
40 X 15	1 1/2 X 1/2	41.30	15.90	33.05	12.70	19.25	22.45	104.60	60.20
40 X 20	1 1/2 X 3/4	41.30	22.20	33.05	17.80	19.25	22.45	104.60	65.30
40 X 25	1 1/2 X 1	41.30	28.60	33.05	22.90	19.25	22.45	104.60	70.40
40 X 32	1 1/2 X 1 1/4	41.30	34.90	33.05	27.95	19.25	22.45	104.60	75.45
50 X 15	2 X 1/2	54.00	15.90	43.20	12.70	22.45	28.85	131.30	74.05
50 X 20	2 X 3/4	54.00	22.20	43.20	17.80	22.45	28.85	131.60	79.15
50 X 25	2 X 1	54.00	28.60	43.20	22.90	22.45	28.85	131.30	84.25
50 X 32	2 X 1 1/4	54.00	34.90	43.20	27.95	22.45	28.85	131.30	89.30
50 X 40	2 X 1 1/2	54.00	41.30	43.20	33.05	22.45	28.85	131.30	94.40



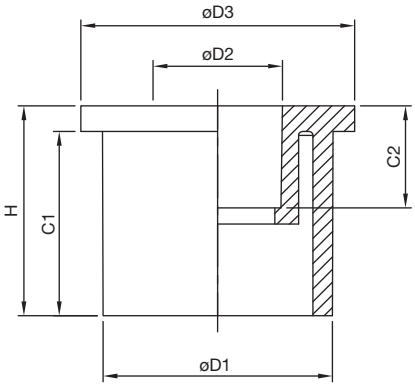
REDUCING TEE (SCH 80)

Size (mm)	Size (inch)	ØD1	ØD2	C1	C2	Z1	Z2	H	L
65 X 50*	2 1/2 X 2	73.00	54.00	44.45	43.20	32.00	38.10	152.90	125.00
80 X 50*	3 X 2	88.90	54.00	47.65	43.20	33.00	46.05	161.30	141.45
80 X 65	3 X 2 1/2	88.90	73.00	47.65	44.45	46.05	46.05	187.40	142.70
100 X 50*	4 X 2	114.30	54.00	57.15	43.20	35.00	58.75	184.30	168.15
100 X 65	4 X 2 1/2	114.30	73.00	57.15	44.45	58.75	58.75	231.80	169.40
100 X 80	4 X 3	114.30	88.90	57.15	47.65	58.75	58.75	231.80	172.60

*Not in Schedule 80

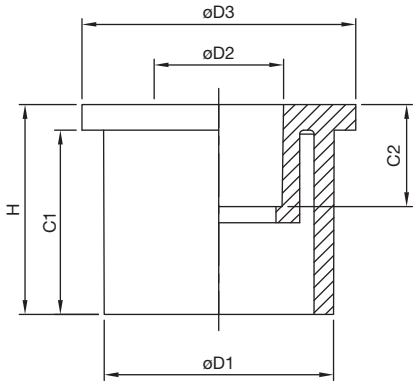
REDUCING BUSH (SDR 11)

Size (mm)	Size (inch)	ØD1	ØD2	ØD3	C1	C2	H
20 X 15	3/4 X 1/2	22.20	15.90	26.55	17.80	12.70	21.00
25 X 15	1 X 1/2	28.60	15.90	34.05	22.90	12.70	26.10
25 X 20	1 X 3/4	28.60	22.20	34.05	22.90	17.80	26.10
32 X 15	1 1/4 X 1/2	34.90	15.90	41.60	27.95	12.70	31.15
32 X 20	1 1/4 X 3/4	34.90	22.20	41.60	27.95	17.80	31.15
32 X 25	1 1/4 X 1	34.90	28.60	41.60	27.95	22.90	31.15
40 X 15	1 1/2 X 1/2	41.30	15.90	49.30	33.05	12.70	36.25
40 X 20	1 1/2 X 3/4	41.30	22.20	49.30	33.05	17.80	36.25



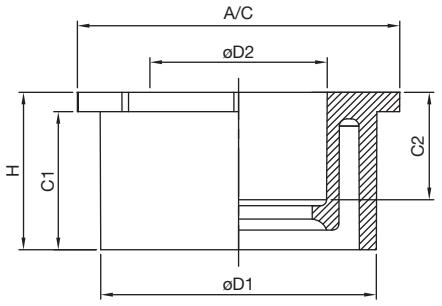
REDUCING BUSH (SDR 11)

Size (mm)	Size (inch)	ØD1	ØD2	ØD3	C1	C2	H
40 X 25	1 1/2 X 1	41.30	28.60	49.30	33.05	22.90	36.25
40 X 32	1 1/2 X 1 1/4	41.30	34.90	49.30	33.05	27.95	36.25
50 X 15	2 X 1/2	54.00	15.90	64.20	43.20	12.70	46.40
50 X 20	2 X 3/4	54.00	22.20	64.20	43.20	17.80	46.40
50 X 25	2 X 1	54.00	28.60	64.20	43.20	22.90	46.40
50 X 32	2 X 1 1/4	54.00	34.90	64.20	43.20	27.95	46.40
50 X 40	2 X 1 1/2	54.00	41.30	64.20	43.20	33.05	46.40



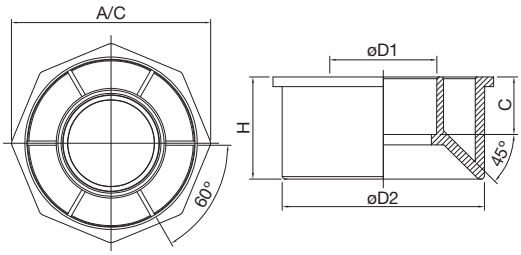
REDUCING BUSH (SCH 80)

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



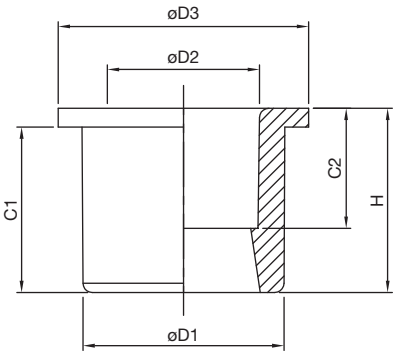
REDUCING BUSH (SCH 40)

Size (mm)	Size (inch)	ØD1	ØD2	C	H	A/C
150 X 80	6 X 3	168.30	77.00	89.50	333.00	258.15
150 X 100	6 X 4	168.30	114.30	51.00	85.00	183.72



TRANSITION BUSH (SDR 11)

Size (mm)	Size (inch)	ØD1	ØD2	ØD3	C1	C2	H
15 X 15	1/2 ITS X 1/2 CTS	21.34	15.90	26.50	17.50	12.70	19.50
20 X 20	3/4 ITS X 3/4 CTS	26.67	22.20	32.50	18.30	17.80	21.30

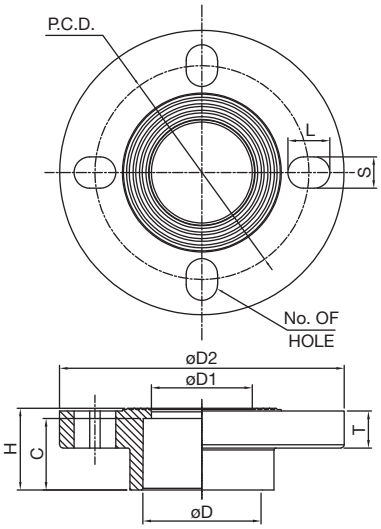


FLANGE WITH SOCKET (1PC) (SDR 11)

Size (mm)	Size (inch)	ØD	ØD1	ØD2	C	H	P.C.D.	No. of Hole	L X S	W
25	1	28.60	23.20	115.00	22.90	28.00	81.50	04	20.50 x 14.00	15.00
32	1 1/4	34.90	28.00	125.00	27.95	33.60	91.00	04	21.50 x 15.50	16.00
40	1 1/2	41.30	33.15	134.50	33.05	40.55	98.00	04	20.50 x 14.00	18.00
50	2	54.00	43.50	160.00	43.20	49.80	118.50	04	25.00 x 17.00	18.00

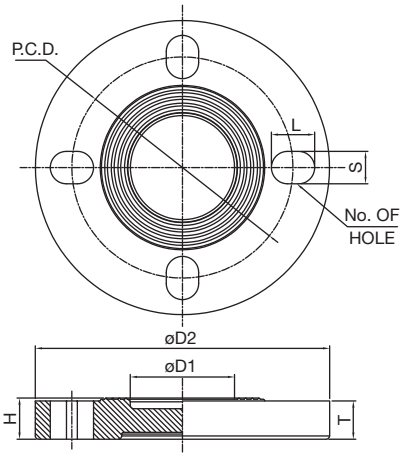
FLANGE WITH SOCKET (1PC) (SCH 80)

Size (mm)	Size (inch)	ØD	ØD1	ØD2	C	H	P.C.D.	No. of Hole	L X S	W
65	2 1/2	73.00	62.75	177.00	44.45	50.85	133.00	04	26.00 x 19.50	23.00
80	3	88.90	77.80	189.00	47.65	55.50	148.00	04	22.00 x 19.00	23.00
100	4	114.30	102.50	227.00	57.15	65.50	183.00	08	25.00 x 19.00	27.50



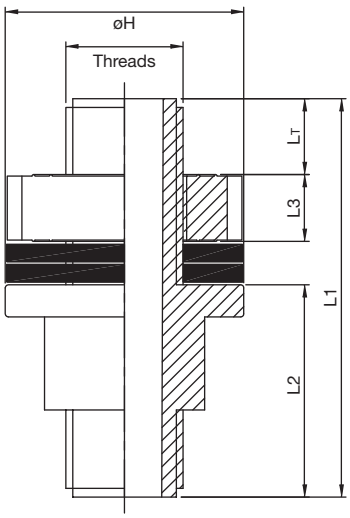
BLIND FLANGE (1PC) (SCH 80)

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



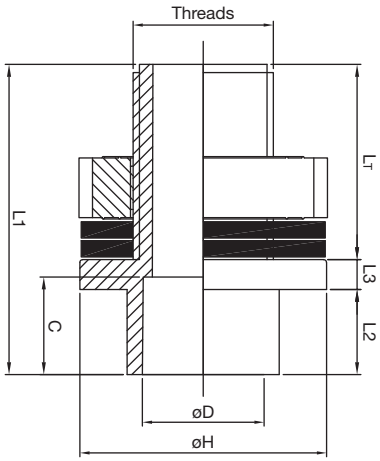
TANK CONNECTOR

Size (mm)	Size (inch)	ØH	Threads	LT	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



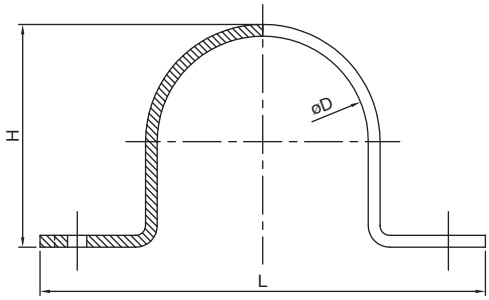
TANK CONNECTOR PLAIN (SOCKET TYPE - MOULDED)

Size (mm)	Size (inch)	ØD	C	ØH	Threads	LT	L1	L2	L3
15	1/2	15.90	12.70	41.00	1/2” (14-TPI)	32.00	47.70	10.20	5.50
20	3/4	22.20	18.00	45.50	3/4” (14-TPI)	36.00	57.20	15.70	5.50
25	1	28.60	23.50	56.00	1” (11-TPI)	41.00	67.50	21.00	5.50
32	1 1/4	34.90	26.00	65.00	1 1/4” (11-TPI)	44.00	74.00	24.00	6.00
40	1 1/2	41.30	26.00	71.00	1 1/2” (11-TPI)	49.00	79.00	24.00	6.00
50	2	54.00	30.00	83.00	2” (11-TPI)	50.00	84.00	28.00	6.00



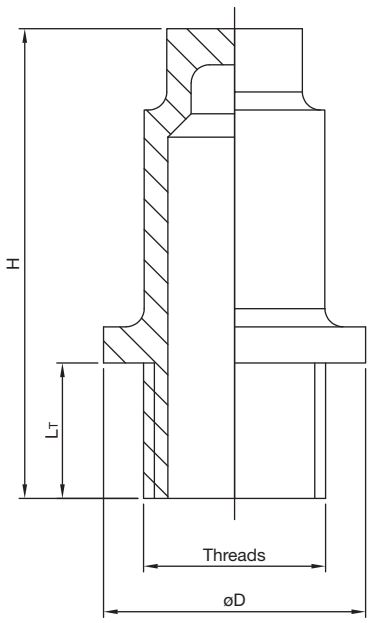
METAL CLAMP* (POWDER COATED)

Size (mm)	Size (inch)	ØD	H	L
15	1/2	15.90	16.40	55.00
20	3/4	22.20	22.70	65.00
25	1	28.60	29.10	72.00
32	1 1/4	34.90	35.40	78.00
40	1 1/2	41.30	41.80	85.00
50	2	54.00	54.50	98.00



EXTENDED END PLUG*

Size (mm)	Size (inch)	ØD	Threads	LT	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

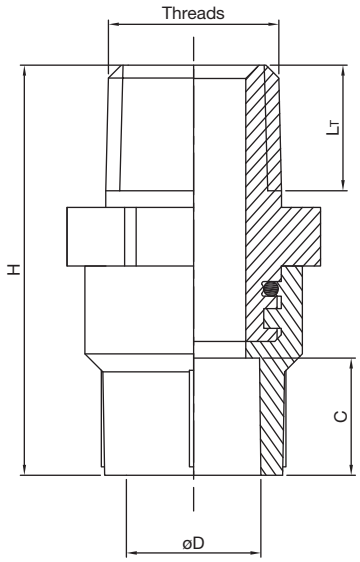


*Non FlowGuard Plus Product

BRASS INSERT FITTINGS

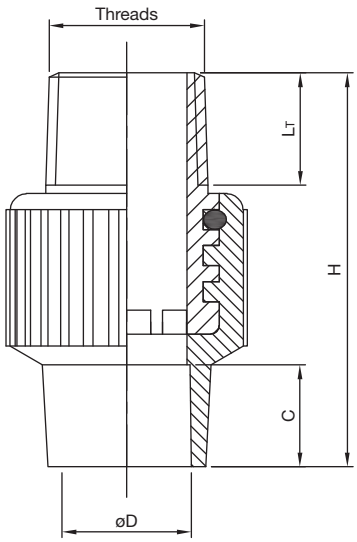
MALE THREADED ADAPTOR (HEAVY) (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	Lт	H
15	1/2	15.90	14.00	1/2” (BSPT)	15.00	49.00
20	3/4	22.20	19.00	3/4” (BSPT)	15.00	56.00
25	1	28.60	24.00	1” (BSPT)	20.15	71.25
32	1 1/4	34.90	27.95	1 1/4” (BSPT)	21.20	80.75
40	1 1/2	41.30	33.05	1 1/2” (BSPT)	21.75	88.15
50	2	54.00	43.80	2” (BSPT)	22.60	102.25



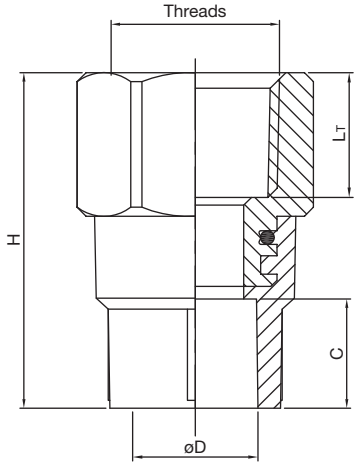
MALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	Lт	H
15	1/2	15.90	12.70	1/2” (14-TPI)	14.00	49.00
20	3/4	22.20	17.80	3/4” (14-TPI)	15.30	57.10
25	1	28.60	22.90	1” (11-TPI)	18.00	65.00
32	1 1/4	34.90	27.95	1 1/4” (11-TPI)	20.40	80.00
40	1 1/2	41.30	33.05	1 1/2” (11-TPI)	20.40	87.00
50	2	54.00	43.20	2” (11-TPI)	24.70	106.10



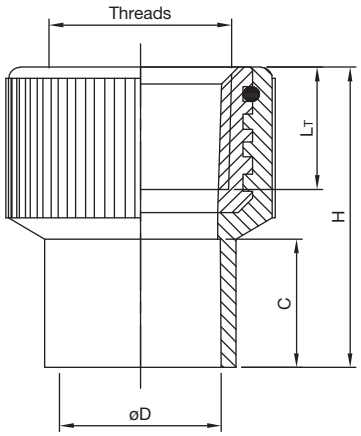
FEMALE THREADED ADAPTOR (HEAVY) (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	Lт	H
15	1/2	15.90	14.00	1/2” (BSPT)	16.00	43.00
20	3/4	22.20	19.00	3/4” (BSPT)	16.75	50.00
25	1	28.60	24.00	1” (BSPT)	22.00	65.20
32	1 1/4	34.90	27.95	1 1/4” (BSPT)	26.60	78.40
40	1 1/2	41.30	33.05	1 1/2” (BSPT)	27.80	83.50
50	2	54.00	43.80	2” (BSPT)	25.40	93.50



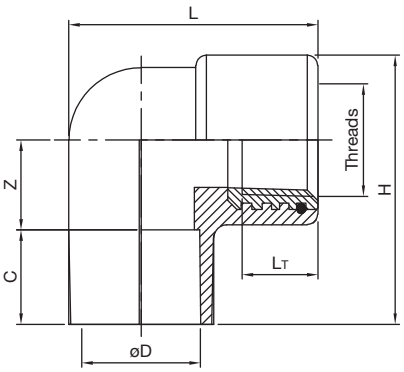
FEMALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	Lт	H
15	1/2	15.90	12.70	1/2” (14-TPI)	15.00	37.20
20	3/4	22.20	17.80	3/4” (14-TPI)	16.30	44.20
25	1	28.60	22.90	1” (11-TPI)	19.00	51.00
32	1 1/4	34.90	27.95	1 1/4” (11-TPI)	21.40	58.00
40	1 1/2	41.30	33.05	1 1/2” (11-TPI)	21.40	65.00
50	2	54.00	43.20	2” (11-TPI)	25.65	80.00



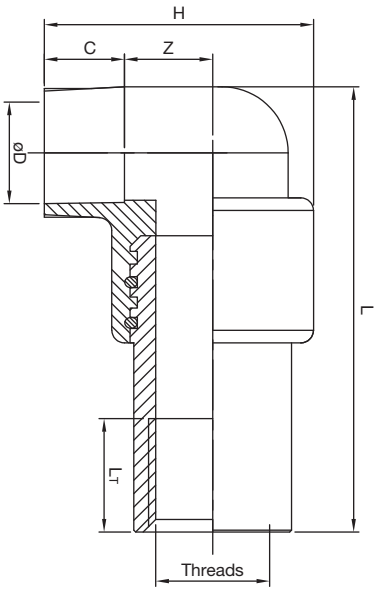
FEMALE THREADED ELBOW (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	Threads	Lт	H	L
15	1/2	15.90	12.70	14.00	1/2” (14-TPI)	15.00	42.70	40.60
20	3/4	22.20	17.80	17.00	3/4” (14-TPI)	16.30	53.80	48.45
25	1	28.60	22.90	21.10	1” (11-TPI)	19.00	67.00	56.40
32	1 1/4	34.90	27.95	21.25	1 1/4” (11-TPI)	21.40	68.70	79.60



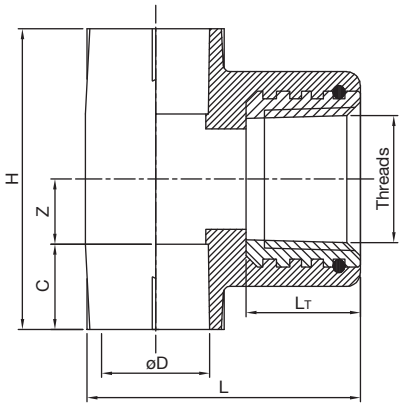
FEMALE THREADED ELBOW (EXTENDED) (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	Threads	Lт	H	L
15	1/2	15.90	12.70	14.00	1/2” (14-TPI)	18.00	42.70	70.60



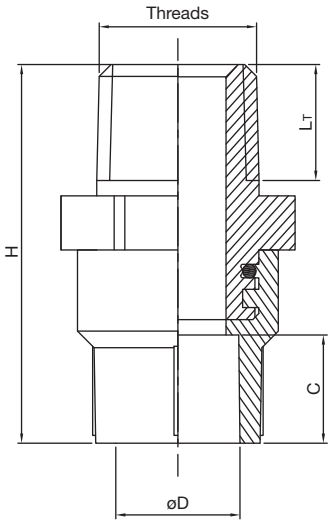
FEMALE THREADED TEE (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	Threads	Lт	H	L
15	1/2	15.90	12.70	9.70	1/2” (14-TPI)	15.00	44.80	41.00
20	3/4	22.20	17.80	12.90	3/4” (14-TPI)	16.30	61.40	48.50
25	1	28.60	22.90	16.10	1” (11-TPI)	19.00	78.00	55.90
32	1 1/4	34.90	27.95	19.25	1 1/4” (11-TPI)	21.40	94.40	68.30



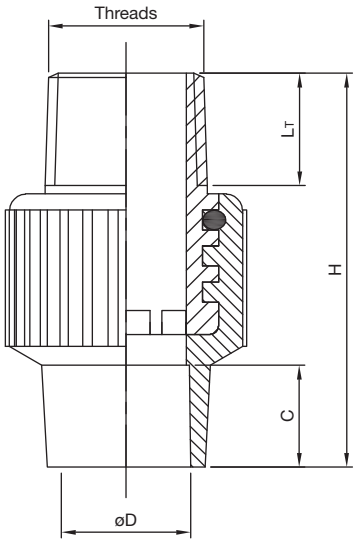
REDUCING MALE THREADED ADAPTOR (HEAVY) (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	Lт	H
20 X 15	3/4 X 1/2	22.20	19.00	1/2” (BSPT)	15.00	56.00



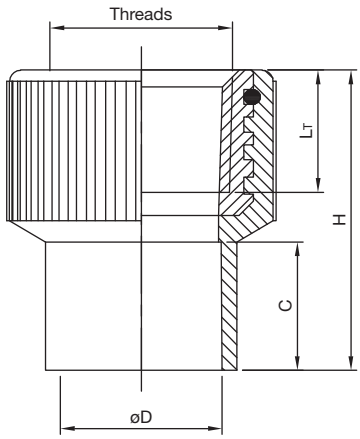
REDUCING MALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	Lт	H
20 X 15	3/4 X 1/2	22.20	17.80	1/2” (14-TPI)	14.00	53.30
25 X 15	1 X 1/2	28.60	22.90	1/2” (14-TPI)	14.00	58.00
25 X 20	1 X 3/4	28.60	22.90	3/4” (14-TPI)	15.30	60.25



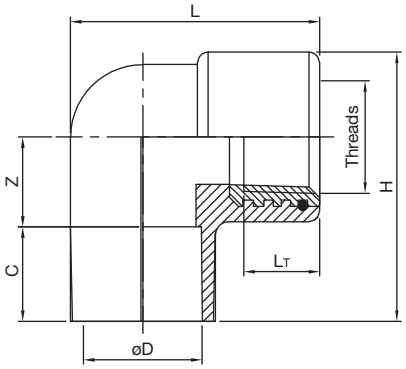
REDUCING FEMALE THREADED ADAPTOR (SDR 11)

Size (mm)	Size (inch)	ØD	C	Threads	LT	H
20 X 15	3/4 X 1/2	22.20	17.80	1/2” (14-TPI)	15.00	41.00
25 X 15	1 X 1/2	28.60	22.90	1/2” (14-TPI)	15.00	45.90
25 X 20	1 X 3/4	28.60	22.90	3/4” (14-TPI)	16.30	47.40



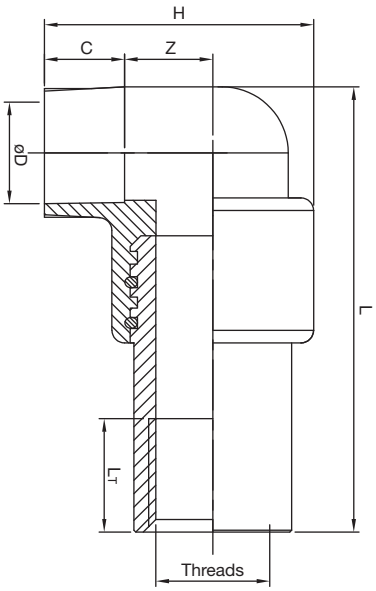
REDUCING FEMALE THREADED ELBOW (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	Threads	LT	H	L
20 X 15	3/4 X 1/2	22.20	17.80	17.00	1/2” (14-TPI)	15.00	50.80	47.00
25 X 15	1 X 1/2	28.60	22.90	14.50	1/2” (14-TPI)	15.00	53.90	53.20
25 X 20	1 X 3/4	28.60	22.90	21.00	3/4” (14-TPI)	16.30	62.90	54.40



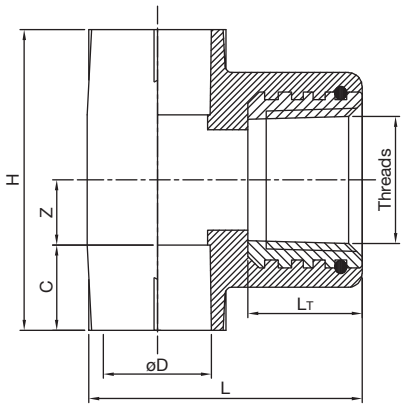
REDUCING FEMALE THREADED ELBOW (EXTENDED) (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	Threads	LT	H	L
20 X 15	3/4 X 1/2	22.20	17.80	17.00	1/2” (14-TPI)	18.00	50.80	73.00



REDUCING FEMALE THREADED TEE (SDR 11)

Size (mm)	Size (inch)	ØD	C	Z	Threads	LT	H	L
20 X 15	3/4 X 1/2	22.20	17.80	12.90	1/2" (14-TPI)	15.00	61.40	49.45
25 X 15	1 X 1/2	28.60	22.90	16.10	1/2" (14-TPI)	15.00	78.00	52.95
25 X 20	1 X 3/4	28.60	22.90	16.10	3/4" (14-TPI)	16.30	78.00	56.15



CONCEALED VALVE*

Size (mm)	Size (inch)
20	3/4
25	1

Details available on request

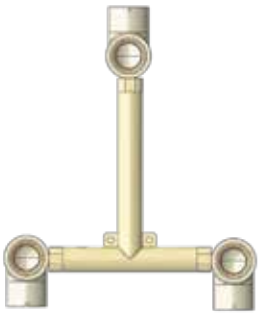
BALL VALVE* (UNION TYPE)

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

Details available on request

*Non FlowGuard Plus Product

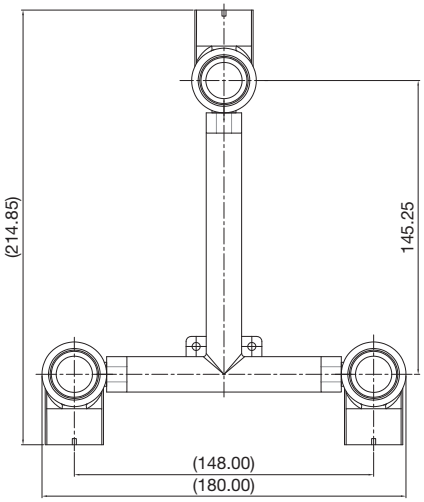
WALL MIXER New

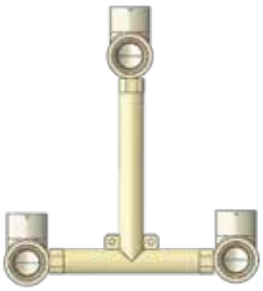


WALL MIXER
(HOT DOWN | COLD DOWN)

20mm (3/4") X 15mm (1/2")

Size (mm)	Size (inch)
150	6

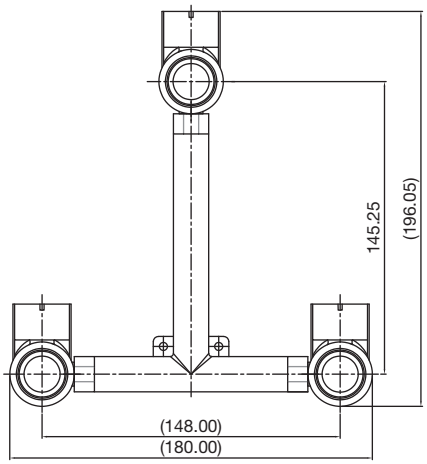


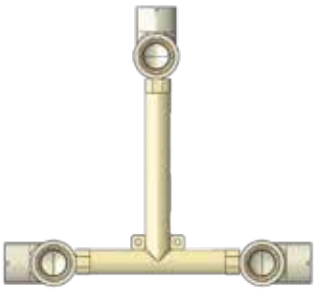


WALL MIXER
(HOT UP | COLD UP)

20mm (3/4”) X 15mm (1/2”)

Size (mm)	Size (inch)
150	6

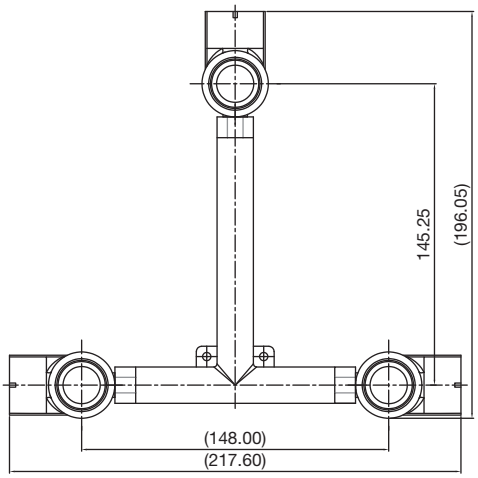


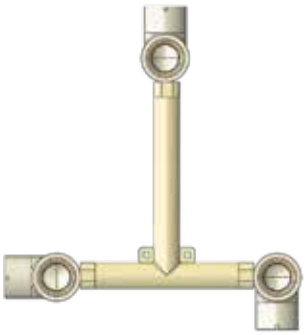


WALL MIXER
(HOT SIDE | COLD SIDE)

20mm (3/4”) X 15mm (1/2”)

Size (mm)	Size (inch)
150	6

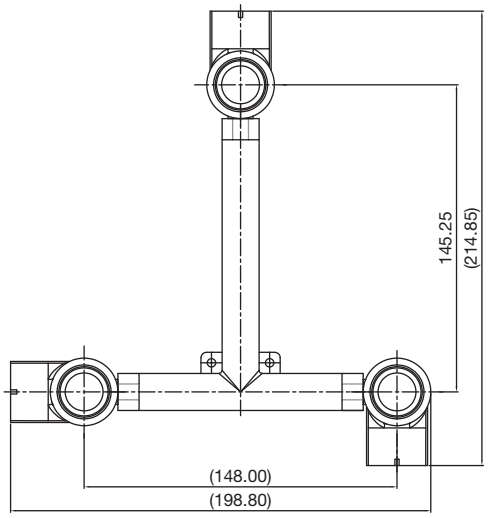


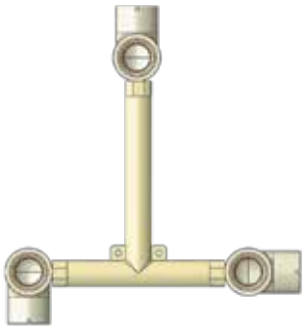


WALL MIXER
(HOT SIDE | COLD DOWN)

20mm (3/4”) X 15mm (1/2”)

Size (mm)	Size (inch)
150	6

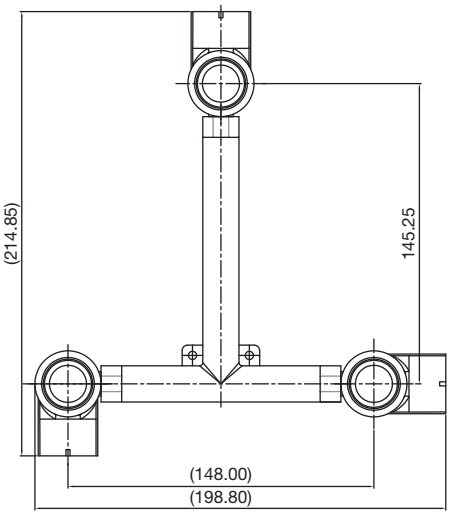


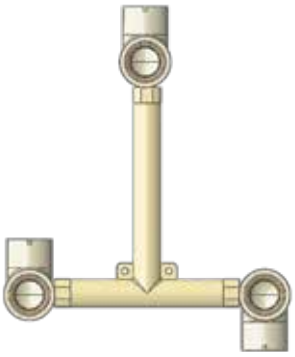


WALL MIXER
(HOT DOWN | COLD SIDE)

20mm (3/4") X 15mm (1/2")

Size (mm)	Size (inch)
150	6

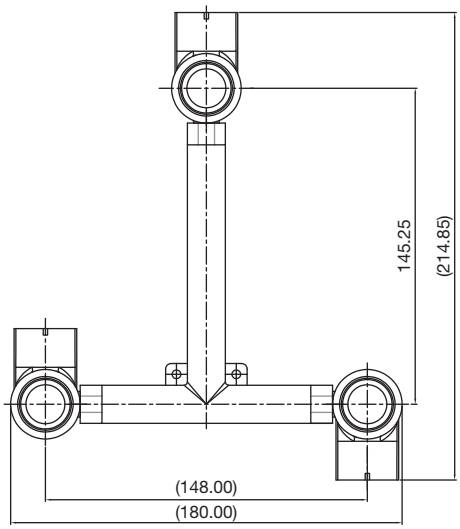


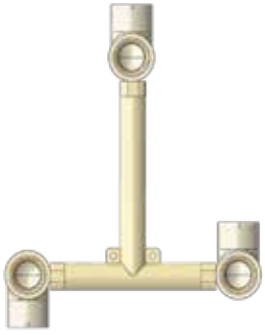


WALL MIXER
(HOT UP | COLD DOWN)

20mm (3/4") X 15mm (1/2")

Size (mm)	Size (inch)
150	6

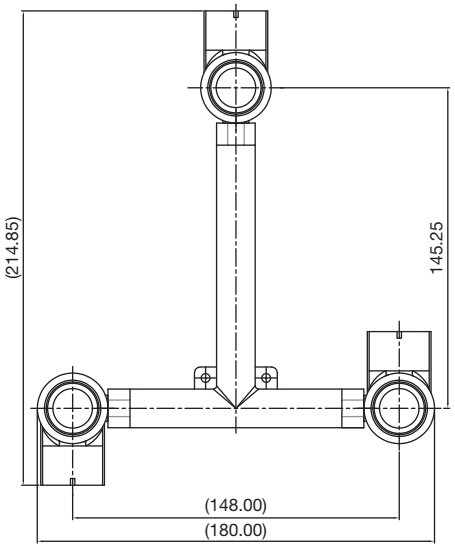




WALL MIXER
(HOT DOWN | COLD UP)

20mm (3/4") X 15mm (1/2")

Size (mm)	Size (inch)
150	6



SOLVENT CEMENT

WORLD'S FIRST CPVC CEMENT WITH **3 YEAR SHELF LIFE#**

TUBE (YELLOW)

Size (ml)
29.5
59

TIN (YELLOW)

Size (ml)
59
118
237
473
964

TIN* (HEAVY)

Size (ml)
118
237
473
964

PRIMER CLEAR* (TIN)

Size (ml)
118
237
473
964

*Non FlowGuard Plus Product

#Applicable for unopened cans from the date of manufacturing

QUALITY CONTROL

All pipes and fittings at Prince Pipes undergo stringent testing for strict control of quality in order to ensure that only the best product reaches its customers. Some of the tests that are performed in-house are:

RAW MATERIALS

- Cell Classification Test
- Tensile Strength
- Modulus of Elasticity in Tension
- Izod Impact Strength
- Heat Deflection Temperature Under Load
- Density
- Color

FITTINGS

- Burst Pressure Test
- Heat Distortion Test
- Dimensions
- Visual Appearance
- Thermocycling Test
- Torque Test

COMPLETE SYSTEM TEST: ASSEMBLY OF PIPES & FITTINGS WITH SOLVENT CEMENT

- Quick pressure test at 23°C @36kg/cm^2 for 10 minutes.
- Malfunction test at 95°C @ 10kg/cm^2 for 1000 Hrs.
- Hydrostatic sustained pressure test at 82°C @ 28kg/cm^2 for 4 hours
- Effect on water
- Flattening Test

PIPES

- Tensile Strength Test
- Hydrostatic Pressure Test
  - Short Term
  - Long Term
- Maximum Burst Pressure Test
- Drop Impact Test
- Heat Reversion Test
- Opacity Test
- UV Stability Test
- Visual Appearance
- Dimensions and Ovality
- Vicat Softening Temperature Test

THERMAL EFFECTS

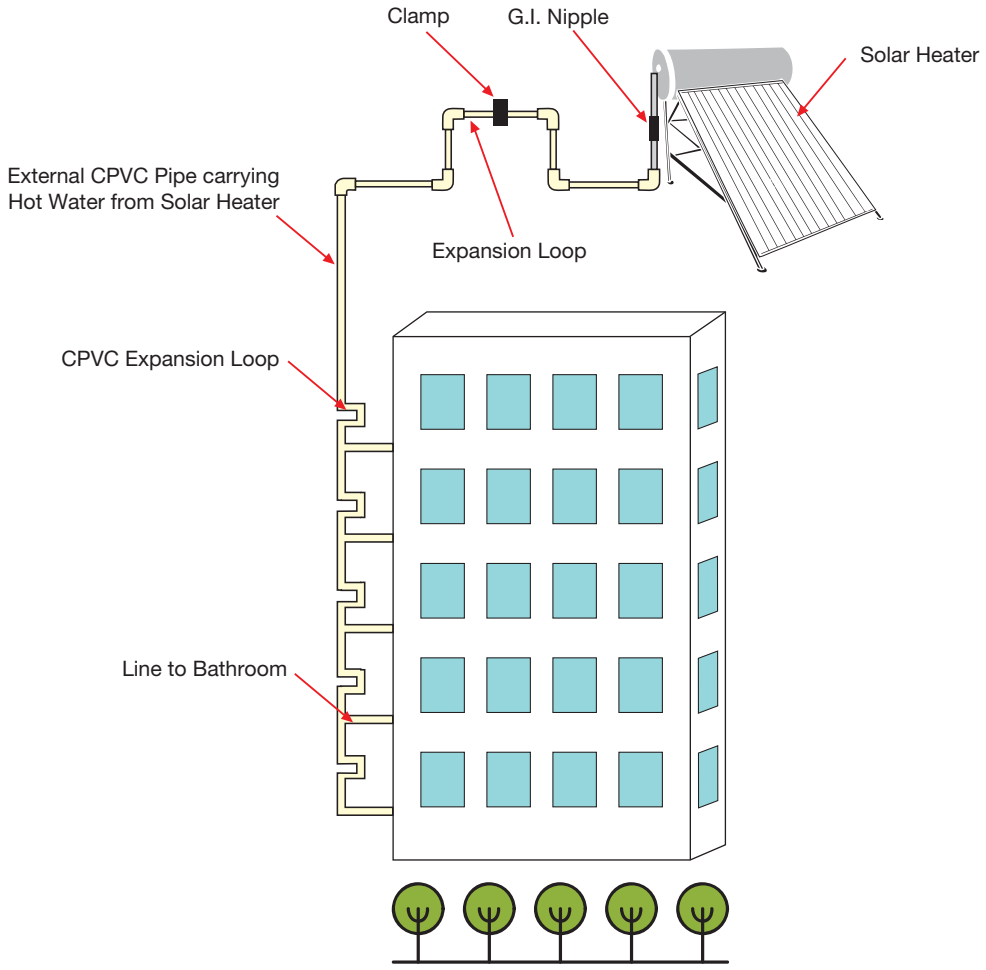
EXPANSION AND CONTRACTION

For CPVC pipes which are not embedded inside the wall but are carrying hot water from boiler/ solar water heater etc., it is important to make provision for expansion loop for every 12 feet run of the pipe, between two fixed joints.

For longer lines and longer distances, kindly refer to the below link for calculations or call our executive.
https://www.flowguard.com/en-in/resources

Use only one brand in expansion loop between two consecutive fixed joints.

CARRYING HOT WATER FROM SOLAR HEATING SYSTEM



RESIDENTIAL TOWER

CORRECT INSTALLATION IN SOLAR WATER HEATER LINES

It is not recommended to directly connect CPVC pipes to the water heater outlet.

One meter long metal nipple should be connected directly to the heater so that the CPVC pipe is not damaged by the buildup of excessive radiant heat from the flue.

HEAT LOSS PREVENTION

In closed loop systems or plumbing systems with long run lengths, in order to conserve energy, it is recommended to use appropriate and compatible thermal insulation material.

EXPANSION AND CONTRACTION LOOP

EXPANSION LOOP FORMULA

$$L = \sqrt{\frac{3ED(\Delta L)}{2S}}$$

WHERE:

- L = Loop length (in.)
- E = Modulus of elasticity at maximum temperature (psi)
- S = Working stress at maximum temperature (psi)
- D = Outside diameter of Pipe (in.)
- ΔL = Change in length due to change in temperature (in.)

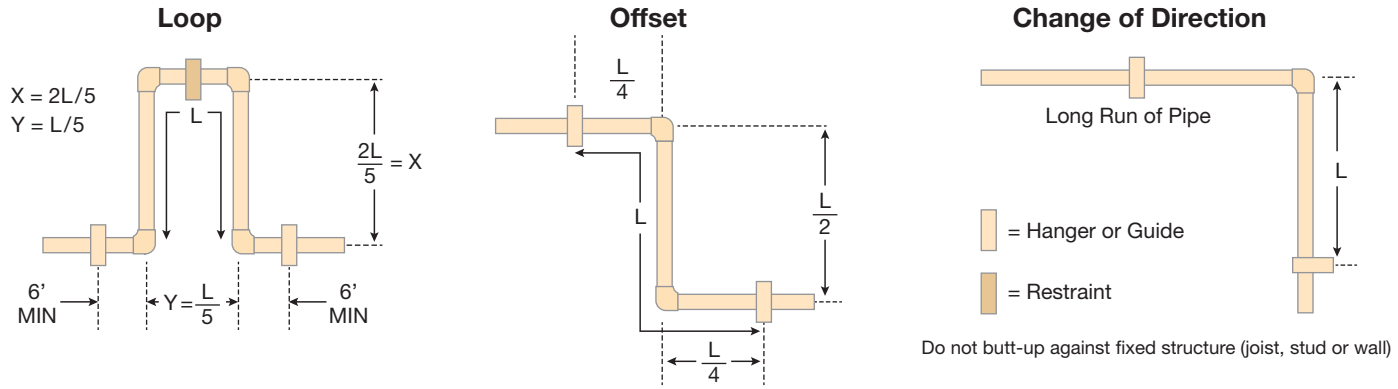
THERMAL EXPANSION FORMULA

$$\Delta L = L_p \, C \, \Delta T$$

WHERE:

- ΔL = Change in length due to change in temperature (in.)
- L_p = Length of pipe (in.)
- C = Coefficient of thermal expansion (in./in./°F)
  = 3.4×10^5 in./in./ °F for CPVC
- ΔT = Change in temperature (°F)

EXPANSION LOOP DIAGRAM



The Clamp should be placed away from the elbows so that they do not restrict free movement of the pipe.

HORIZONTAL AND VERTICAL SPACING IN INSTALLATION

A typical hot and cold water distribution system operating at 60° - 70°C requires support for horizontal lines every 90 cm for diameters below 32 mm and every 120 cm for larger sizes.

However, the following spacings are based on assumptions and can be used at water temperatures indicated below.

Nominal in	Size mm	68°F ft	20°C mtr	122°F ft	50°C mtr	158°F ft	70°C mtr	176°F ft	80°C mtr
½	12.70	5.5	1.7	4.5	1.4	3.0	0.9	2.5	0.8
¾	19.05	5.5	1.7	5.0	1.5	3.0	0.9	2.5	0.8
1	25.40	6.0	1.8	5.5	1.7	3.5	1.1	3.0	0.9
1¼	31.75	6.5	2.0	6.0	1.8	3.5	1.1	3.0	0.9
1½	38.10	7.0	2.1	6.0	2.0	3.5	1.1	3.5	1.1
2	50.80	7.0	2.1	6.5	2.0	4.0	1.2	5.5	1.1
2½	63.50	8.0	2.4	7.5	2.3	4.5	1.4	4.0	1.2
3	76.20	8.0	2.4	7.5	2.3	4.5	1.4	4.0	1.2
4	101.60	9.0	2.7	8.5	2.6	4.5	1.4	4.5	1.4
6	152.40	10.0	3.0	9.0	2.7	5.5	1.7	5.0	1.5

WORLD'S FIRST CPVC CEMENT WITH 3-YEAR SHELF LIFE

E-Z WELD®

PRINCE PIPES IN ASSOCIATION WITH E-Z WELD, WORLD LEADERS IN SOLVENT CEMENTS, BRING TO YOU THE BEST-IN-CLASS ADHESIVE. THIS SOLVENT CEMENT IS FAST-SETTING, MAKING THE INSTALLATION PROCESS QUICK AND EASY.

- 3-Year shelf life (unopened cans from the date of manufacturing)
- For copper tube size CPVC hot and cold potable water pipe & fittings up to 2" Dia (50 mm) interference fit
- Adherence to the parameters of ASTM D2846 and F493
- Sets faster resulting in quicker installation
- Environment friendly
- NSF certified for solvent cement only

pw-G-dwv-sw
U.P. Code

JOINTING METHODS

PROCESS: **Solvent Joint**

DOs

CUTTING

It is imperative to mark the pipe from all sides so that pipe is cut with the help of a hand saw. It should be a right angle cut from all the sides. The cut piece should not be with burr on edge.

CHAMFERING

After cutting, the pipe needs to be chamfered from the outer sides. It is advisable to provide approximately 2 mm wide, 15° chamfer on spigot end.

DEBURRING AND RIDGE REMOVAL

Remove all the burrs and ridges accumulated on the inner as well as the outer edges of the pipe with the help of a deburring knife, file or abrasive paper.

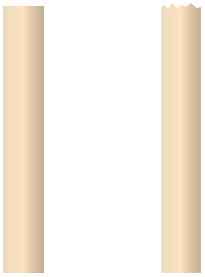
DRYFIT TEST

Before applying solvent cement, insert the pipe end into the socket of the next pipe or fitting to check that interference occurs at about 1/3 to 2/3 of the socket depth.

DON'Ts

CUTTING

Do not cut or slant unevenly.



Uniform cut Uneven cut

CHAMFERING

Do not proceed with installation of pipe without chamfering.

DEBURRING AND RIDGE REMOVAL

Do not proceed with the installation of pipe without deburring.

DRYFIT TEST

Do not apply solvent cement without dryfit test.

CLEANING

Thoroughly clean the pipe with dry cloth where the solvent cement is going to be applied to avoid dust, dirt, oil, moisture and other foreign materials during the installation process.

CLEANING

Do not join the pipes without cleaning the pipe ends.

APPLICATION OF SOLVENT CEMENT

Mark the pipe length to be inserted for jointing.
Apply a coat of solvent cement with the help of a brush on the marked surface of the pipe and inside of the fitting.

APPLICATION OF SOLVENT CEMENT

Do not apply excess solvent cement. Ensure there is no run down of the solvent cement on the pipe or inside of the fitting.

JOINTING

Push the pipe inside the fitting till it is seated in the fitting and quarter turn it. Wipe off the excess solvent cement that come out at the edge. Hold the joint for one to two minutes so that the jointing is perfect.

JOINTING

Do not use a hammer or half push the pipe.

Note - For higher diameter pipes above 2" a primer coat has to be used before the solvent cement (2-step solvent cement).

PROCESS: Threaded Joint

DOs

FOR THREADED JOINTS

a) Clean the male & female threads.
b) Apply teflon tape in the direction of thread tightening.
c) Hand-tighten the threads firmly.
d) Tighten the joint further by using pipe wrench.
   Do not over-tighten.
   Use rubber packing to avoid scratches on pipe.

DON'Ts

FOR THREADED JOINTS

Don't over tighten with pipe wrench.

INSTALLATION AND COMMISSIONING

a) Pipeline should be installed in proper alignment and along with necessary clamps.
b) Pressure testing to be done before concealed work using clean water (preferably potable water).
c) Pressure testing may be carried out after a curing period of 24 hours and should not be done before that.

FREQUENTLY ASKED QUESTIONS

DO PRINCE CPVC PIPES COME WITH UV PROTECTION?

FlowGuard Plus piping systems have been used exposed to sunlight for many years since inception and have shown no signs of deterioration even after many years of exposure to UV from the sunlight. However, some discoloration may occur after a few years of exposure, however, no change in the pressure bearing capacity of the FlowGuard system has been seen. We recommend painting the pipe with water-based/ latex paint to ensure no change in color. Please do not use oil/ solvent-based paints as these paints can drastically reduce the life of the system.

WHAT ABOUT PIPES WITH CONCEALED INSTALLATIONS? CAN THE PUNCTURES BE REPAIRED & HOW?

Repair of the punctured and damaged pipes due to drilling/chiseling can be done by removing the adhesive plaster and using the pipe repair piece supplied by the company. Thoroughly clean the area of pipe damaged and make it dry. Apply solvent adhesive on the surface of the pipe's amaged portion along the circumference. Also, apply solvent adhesive on the inner surface of the pipe repair piece and snap it over the damaged area. Tie a small piece of string/binding wire around the repair piece and pipe for some time to allow it to set. This is a unique system available with CPVC pipe where the damaged pipe need not be cut or shifted back and forth for repair. Do a pressure test before replastering.

HOW ABOUT THERMAL CONDUCTIVITY? DO CPVC PIPES NEED INSULATION?

The thermal conductivity of FlowGuard Plus CPVC pipes and fittings is 0.14 W/MK whereas the same of copper is 400 W/MK. Since CPVC is a very bad conductor of heat, light insulation is recommended only for installations where there is recirculation of hot water, this shall help in reducing the cost of reheating of water. In bathrooms with independent heaters within 3 meters location insulation may not be necessary.

Please ensure that the insulation material or glue which is being used to hold the insulation material does not contain any phthalate plasticizer as it is not compatible with CPVC and can cause failure to the plumbing system in the long run.

At the end of this section, a list of all incompatible materials with CPVC is given for ready reference.

IS IT NECESSARY TO HAVE EXPANSION LOOPS IN HOT WATER LINES?

For CPVC pipes that are not embedded inside the wall but are carrying hot water from a boiler/ solar water heater, etc it is most important to use a ready-made expansion loop supplied by Prince Pipes. Use one readymade loop for every 9-12 ft. run of the pipe, between two fixed joints. The loops are designed for a max and min differential temp of 70°C. For longer lines and longer distances between the fixed joints expansion loops can be made at the site with calculations as per the FlowGuard Plus manual or existing available loops can be used after every 12 feet length of pipe.

HOW HEALTHY AND RELIABLE IS A COMBINATION OF CPVC AND UPVC PIPES?

It is strictly advised to use CPVC pipes in all internal plumbing for both Hot and Cold water line. There have been instances of the nonreturn valve failure or pressure differential in the Hot and Cold water line due to which hot water has entered into the cold line. If the cold water line pipe is not temperature resistant then it will lead to leakage or bursting causing huge loss and inconvenience to the customer.

IS IT REALLY SAFE TO DRINK WATER THAT PASSES THROUGH SOLVENT ADHESIVE JOINTS?

The solvent cement products comply with NSF/ANSI Standard 61 and NSF/ANSI Standard 372 and have been tested by NSF International. So, it is safe for drinking water applications.

PUMP ROOM APPLICATIONS CAN BE COMPLICATED. ANY SUGGESTIONS ON THAT?

Any pump, when switched on, initially if generates very high pressure. This pressure may cause damage to initial fittings in the system. To avoid this damage following precautions to be followed:

a. The ramp-up time to be increased. Because of increased ramp-up time, the pump gradually builds the pressure. This will not damage the initial fittings in the system.

b. Immediately after the pump, 1st and 2nd fitting used should be of metal.

c. After the metal bends, the pipe and fitting selection should be of Schedule 80, and jointing to be done with 2 step solvent cement.

d. Proper supports to be used provided to avoid the sagging of piping.

WATER HAMMER ARRESTOR (WHA)

WATER HAMMER is the term used to define the destructive forces, pounding noises, and vibration which develops in a piping system when a column of non-compressible liquid flowing through a pipeline is stopped abruptly. Fast closing positive shutoff valves incorporated in the plumbing system contribute to creating water shock which is not only annoying but damaging to pipes and appliances.

FRICTION LOSS FORMULA

$$f = 0.2082 \times \left(\frac{100}{C}\right)^{1.852} \frac{g^{1.852}}{d^{4.8655}}$$

f - Friction head in feet of water per 100 feet of pipe

C - Pipe surface roughness constant

g - Flow rate in gallons per minute

d - Inside diameter of pipe in inches

OUR NETWORK


JAMMU & KASHMIR
HIMACHAL PRADESH
PUNJAB
HARYANA
UTTARAKHAND
HARIDWAR
DELHI
GHAZIABAD
JAIPUR
RAJASTHAN
UTTAR PRADESH
ASSAM
HAJIPUR
BIHAR
SILIGURI
KOLKATA
WEST BENGAL
HOWRAH
GUJARAT
MADHYA PRADESH
ATHAL, DADRA
(D & N.H)
ORISSA
BHUBANESWAR
TELANGANA
MAHARASHTRA
NAGPUR
MUMBAI
ANDHRA PRADESH
PUNE
VIJAYAWADA
KOLHAPUR
GOA
KARNATAKA
CHENNAI
HUBLI
PALAKKAD
TAMIL NADU
TRICHY
KERALA
Legend
CORPORATE OFFICE
BRANCH OFFICES
MANUFACTURING UNITS
DEPOTS
UPCOMING UNIT
CHANNEL PARTNERS

PRINCE®
PIPING SYSTEMS

PRINCE PIPES AND FITTINGS LIMITED

Mfg. & Exporters of UPVC, CPVC, PPR & HDPE Pipes, Fittings, Valves & Water Tanks

Corporate Office:
The Ruby, 8th Floor, 29, Senapati Bapat Marg (Tulsi Pipe Road),
Dadar (W), Mumbai - 400028, Maharashtra, India.
F: 022-6602 2220 I E: info@princepipes.com

Branch Offices:
Ahmedabad I Chennai I Delhi I Kolkata I Pune

Depots
Ghaziabad I Siliguri I Howrah I Hajipur I Bhubaneswar
Nagpur I Vijayawada I Hubli I Palakkad I Trichy

Zero Defect
Manufacturing Process

Toll Free: 1800 267 7555
Please call between 10 am to 6 pm

www.princepipes.com

Follow us on:

PPF/ FGP+Prince CPVC Technical Manual/Rev. No. 00/ January 2021
Printed in January 2021