

FIBERSTRONG®

PRODUCT INFORMATION



DISCLAIMER

All information was correct at the time of going to press. However, we reserve the right to alter, amend and update any product, information and service described in this brochure.

No part of this brochure may be reproduced in any form, by printing, photo print, microfilm, photocopies or any other means without the written permission of Future Pipe Industries.

©2009 by Future Pipe Group.

OVERVIEW

Future Pipe Industries, member of Future Pipe Group, is a leading manufacturer of high performance, anti-corrosive pipe systems for Oil & Gas, Petrochemical, Power Generation, Desalination and Civil Industries, in addition to the municipal applications. The group was founded in 1973, and since then, has evolved into the leading provider of composite thermosetting pipe systems and technologies in Europe, Africa and the Middle East.

ACCREDITATIONS

Future Pipe Group is accredited for the Quality Management System (BS EN ISO 9001:2000) and Environmental Management System (BS EN ISO 14001:1996). In addition, certificates of the suitability to transmit potable water from the Water Regulation Advisory Scheme (WRAS) Great Britain and the National Sanitation Foundation (NSF) USA.



Table of Contents

GLASS REINFORCED PLASTIC PIPE PRODUCT INFORMATION

1	DESCRIPTION	2
	A. General	2
	B. Construction	2
	C. Applicable Codes/Standards	2
2	FEATURES AND BENEFITS	3
3	USE AND APPLICATION	3
4	PRESSURE AND LOADING RESTRICTIONS	4
	A. Pressure Restrictions	4
	B. Stiffness Classes and Allowable Vacuum	4
5	JOINTS	5
	A. Double Bell Reka Couplings	5
	B. Alternative Jointing Systems	5
6	PRODUCT QUALIFICATION	5
7	QUALITY CONTROL	6
8	PHYSICAL / MECHANICAL PROPERTIES	7
	A. Spigot Outside Diameter	7
	B. Dimensions	7
	C. Specific Tangential Initial Stiffness (STIS)	8
	D. Mechanical Properties	8
	E. Approximate Pipe and Joint Weights for Handling Purposes Only-(Based on PN6)	8
9	FITTINGS	9
	A. Elbows	10
	B. Reducers	12
	C. Tees	16
	D. Wyes	47
	E. Flanges	71
	F. Custom Designed Fittings	71
10	VISUAL PROPERTIES	72
	A. EXTERIOR VISUAL PROPERTIES	72
	B. VISUAL DEFECTS LIMITS	72
11	REPAIR WORK	73
12	MARKING AND IDENTIFICATION	73

GLASS REINFORCED PLASTIC PIPE PRODUCT INFORMATION

1. DESCRIPTION

A. GENERAL

FIBERSTRONG® non-restrained pipe and joint are Glass Reinforced Plastic (GRP) flexible corrosion resistant pipe system intended for underground use*. It consists of a Thermosetting Chemical resistant polyester resin, Fiberglass Reinforcements and fine Silica sand aggregates to BS EN 1796 / BS EN 14364 / AWWA C-950.

Large diameter pipes are available in nominal diameters ranging from 80 to 4000 mm.

Available standard pressure classes are PN1, 3, 6, 10, 12, 16, 20 and 25 and stiffness classes of 2,500, 5,000 and 10,000 N/m².

* With special engineering procedures the pipes can also be used for above ground installation.

B. CONSTRUCTION


The pipe consists of a resin-rich reinforced liner, structural wall and a resin-rich exterior layer. "C" glass is used at the internal and external pipe surfaces.



C. APPLICABLE CODES/STANDARDS

Standards	Main Applications
ASTM D-3262	Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
ASTM D-3517	Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe
ASTM D-3754	Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe
AWWA C-950	Fiberglass Pressure Pipe
AWWA M-45	Fiberglass Pipe Design Manual
BS EN 1796	Plastics Piping Systems for Water Supply With or Without Pressure – Glass-Reinforced Thermosetting Plastics (GRP) Based on Unsaturated Polyester Resin (UP).
BS EN 14364	Plastics Piping Systems for Drainage and Sewerage With or Without Pressure – Glass-Reinforced Thermosetting Plastics (GRP) Based on Unsaturated Polyester Resin (UP) – Specifications for Pipes, Fittings and Joints.

2. FEATURES AND BENEFITS

Features	Benefits
<p>Manufactured with corrosion resistant composite material.</p> 	<ul style="list-style-type: none"> • Long, effective service life. • No need for expensive cathodic protection. • No need for costly pipe coating, wrapping, lining, painting, or use of polyethylene wraps. • Low maintenance costs. • Hydraulic characteristics essentially remain unchanged over time.
<p>Double bell coupling joints manufactured with corrosion resistant glass fiber and sealed with elastomeric gaskets.</p>	<ul style="list-style-type: none"> • Ease of jointing helps reduce installation time. Tight, efficient joints designed to eliminate infiltration and ex-filtration. • Costly joint diapers are not required. • Allows for flexible alignment, accommodating changes in line direction with fewer fittings.
<p>Light weight. 1/4 the weight of ductile iron and 1/10 of concrete pipe.</p>	<ul style="list-style-type: none"> - Easy to install. - Low delivery costs. No need for expensive handling equipment.
<p>Manufactured in long sections up to 12m.</p>	<ul style="list-style-type: none"> - Fewer joints reduce installation time.
<p>Extremely smooth bore.</p>	<ul style="list-style-type: none"> - Low friction loss means less pumping energy needed. - Minimum slime build up can help lower cleaning costs.
<p>Pipe specifications meet or exceed worldwide standards.</p>	<ul style="list-style-type: none"> - Assures high quality product specifications. Easy for engineers to specify Fiberstrong pipe with confidence.
<p>High technology pipe manufacturing system.</p>	<ul style="list-style-type: none"> - Helps ensure consistent product quality worldwide.

3. USE AND APPLICATION

FIBERSTRONG® GRP pipe is Suitable for underground use in potable water, raw water, seawater and corrosive environments including sanitary sewage, and many industrial effluents with a temperature range of -40 ° C to +50 ° C. All industrial pipe applications must be approved by Future Pipe Industries.



4. PRESSURE AND LOADING RESTRICTIONS

A. PRESSURE RESTRICTIONS

Pipe manufactured per this specification will have the following pressure capabilities regardless of pipe stiffness.

Pressure Class (KPa)	PN1	PN3	PN6	PN10	PN12	PN16	PN20	PN25
Maximum operating pressure (KPa)	100	300	600	1,000	1,200	1,600	2,000	2,500
Maximum surge pressure (KPa)	140	420	840	1,400	1,680	2,240	2,800	3,500
Maximum field test pressure (KPa)	150	450	900	1,500	1,800	2,400	3,000	3,750
Maximum factory test pressure (KPa)	200	600	1,200	2,000	2,400	3,200	4,000	5,000



B. STIFFNESS CLASSES AND ALLOWABLE VACUUM

GRP pipes shall have the following characteristics regardless of pressure class.

Stiffness Class	SN 2500	SN 5000	SN 10000
Minimum Specific Tangential Initial Stiffness STIS = EI/D^3 (N/m ²) Maximum allowable vacuum level in KPa at cover with hard soil & water table at grade and pipe installed in: Installation Type*	2,500	5,000	10,000
(I) Full compacted gravel @maximum cover depth	-100	-100	-100
(II) Full Sand compacted to 90%standard proctor density (@depth shown in m)	-60 (4m)	-100 (6m)	-100 (13m)

*Maximum vacuum level varies with the type of installation and burial depth. Refer to the current Future Pipe Industries FIBERSTRONG® Installation Guide for Underground Pipe System for the allowable vacuum levels for other installation types.

5. JOINTS

A. DOUBLE BELL REKA COUPLINGS

FIBERSTRONG® pipes and fittings are jointed using Double Bell Reka Couplings. The sealing of the joints is achieved by the compression of two rubber gaskets when the joint is assembled.



B. ALTERNATIVE JOINTING SYSTEMS

- a) In certain applications Pipe sections may be laminated* together utilizing an external (and internal) lay-up "butt-strap" consisting of layers of fiberglass mats and/or tapes impregnated with polyester resin. The strength of the lay-up exceeds the pipe wall strength.
- b) Mechanical couplings manufactured by Straub, Teekay, Dresser, VJ or equivalent may be used for jointing to different pipe materials. Refer to section SPIGOT OUTSIDE DIAMETER for FIBERSTRONG® pipe O.D's.
- c) GRP flanges drilled to any standard dimensions requested by client, such as ANSI, DIN, ISO, etc...



*Laminated pipes may have different design if lamination is intended to avoid thrust blocks. 6.

6. PRODUCT QUALIFICATIONS

FIBERSTRONG® Pipes have been tested and qualified for the following tests:

ASTM D 3681:	Chemical resistance of "Fiberglass" (Glass - Fiber - Reinforced Thermosetting - Resin) pipe in deflected condition (Strain corrosion performance).
BS 5480: 1990 (Appendix L):	British standard specification for glass reinforced plastics (GRP) pipes, joints and fittings for use for water supply or sewerage - method for determination of long term specific ring stiffness and creep factor under ring deflection.
ASTM D 4161:	Standard specification for "Fiberglass" (Glass - Fiber - Reinforced Thermosetting - Resin) pipe joint using flexible elastomeric seals.
ASTM D 1599	Short time Hydraulic failure pressure of pipes, fittings and prefabricated spools
BS 5480:1990 (Appendix J):	British standard specification for glass reinforced plastics (GRP) pipes, joints and fittings for use for water supply or sewerage - method for determination of Impact Resistance
ASTM D 2992:	Standard practice for obtaining hydrostatic or pressure design basis for "Fiberglass" (Glass - Fiber - Reinforced Thermosetting - Resin) pipe and fittings. (Hydrostatic Design Basic (HDB)).
ASTM D 5365:	Standard Test Method for Long-Term Ring-Bending Strain of "Fiberglass" Pipe

7. QUALITY CONTROL

Quality Control testing will include thorough checks for all incoming raw materials and finished products against Future Pipe Industries strict written standards. The following physical and dimensional checks will be made:

Type of Test	Each Pipe	Once per LOT*	Standard Reference
Visual Inspection	x		FPI
Wall Thickness	x		FPI
Spigot end Outside diameter	x		FPI
Length	x		FPI
Hydrostatic Pressure**	x		FPI
Barcol Hardness	x		ASTM D 2583
Stiffness		x	ASTM D 2412
Constituents by Wt % (LOI)		x	ASTM D 2584
Axial Tensile Strength		x	ASTM D 638/ BS 5480
Circumferential Tensile Strength		x	ASTM D2290/D638/ BS5480
Impact Resistance		x	BS 5480 Ap. J
Deflection to crack		x	ASTM D 2412

Records of all testing on pipe sections will be maintained by Future Pipe Industries and provided upon request.

* 1 in 100 pipes or as required by the project specifications

** As per AWWA C950 section 5.1.2.1

8. PHYSICAL / MECHANICAL PROPERTIES

A. SPIGOT OUTSIDE DIAMETER

Nominal Diameter: DN (mm)	DOS** _{MIN} (mm)	Nominal Diameter: DN (mm)	DOS** _{MIN} (mm)
300	313.5*	2100	2146.0
350	365.5*	2200	2248.0
400	412.0*	2300	2350.0
450	463.0*	2400	2452.0
500	514.0*	2500	2554.0
600	616.0*	2600	2656.0
700	718.0	2700	2758.0
800	820.0	2800	2860.0
900	922.0	2900	2962
1000	1024.0	3000	3064.0
1100	1126.0	3100	3166
1200	1228.0	3200	3268.0
1300	1330.0	3300	3370
1400	1432.0	3400	3472
1500	1534.0	3500	3574.0
1600	1636.0	3600	3676
1700	1738.0	3700	3778.0
1800	1840.0	3800	3880
1900	1942.0	3900	3982
2000	2044.0	4000	4084.0

* Check with your local Future Pipe Industries sales office for the applicable spigot OD values.

** For High pressure pipes i.e. PN20 and PN25, an additional 0.5 mm to be added to the tabulated values of DOSMIN, DOSNOM and DOSMAX.

B. DIMENSIONS

Dimensions	Specifications	Tolerances
Standard Pipe Length (L)	Standard Lengths 12m. Random Length or factory jointed lengths supplied shall not exceed 10% of the order.	±25mm
End Squareness/ End Planeness	Ends shall be square to both axis of the pipe plane.	Not to exceed 2+0.005D (mm) where D is the nominal diameter of the pipe or 10mm, whichever is smaller.
Straightness	Pipes shall be straight.	Not to exceed 0.3% of the effective length of the pipe or 15mm, whichever is smaller.
Thickness	As per FPI design values.	Single point 87.5% of minimum average.
Roundness Deviation *	Pipes shall be round.	±1%

C. SPECIFIC TANGENTIAL INITIAL STIFFNESS (STIS)

Stiffness Class	Minimum STIS*	Minimum Pipe Stiffness (PS**)
	(EI/D ³) Pa	F/ AY=EI/(0.149 r ³) KPa
SN 2500	2500	124
SN 5000	5000	248
SN 10000	10000	496

* Specific Tangential Initial Stiffness determined as per ASTM D-2412 or BS 5480

** As per ASTM D-2412

D. MECHANICAL PROPERTIES

All Pipes will exhibit the following properties

Linear Coefficient of thermal expansion (mm/mm/°C) 25 to 30 x 10⁻⁶
 Poisson's Ratio 0.25 to 0.3

E. Approximate Pipe and Joint Weights for Handling Purposes Only-(Based on PN6)

DN	SN 2500	SN 5000	SN 10000	SN 12500	Couplings
	(Kg/m)	(Kg/m)	(Kg/m)	(Kg/m)	(Kg)
80	2	3	6	6	5
100	3	4	7	8	6
150	4	5	8	9	7
200	5	7	9	10	8
250	6	8	10	11	9
300	7	9	11	12	10
350	10	12	15	16	12
400	13	16	20	20	13
450	16	20	25	26	15
500	19	24	31	31	18
600	27	34	44	45	24
700	36	46	59	61	30
800	47	60	76	79	36
900	59	75	96	100	42
1000	73	92	119	123	49
1100	87	111	142	148	56
1200	103	131	170	176	63
1300	120	153	199	206	70
1400	138	177	230	238	77
1500	159	203	265	273	83
1600	178	230	300	311	90
1700	203	260	337	349	97
1800	228	291	379	393	104

DN	SN 2500	SN 5000	SN 10000	SN 12500	Couplings
	(Kg/m)	(Kg/m)	(Kg/m)	(Kg/m)	(Kg)
1900	253	323	421	437	111
2000	280	361	466	484	118
2100	307	396	513	533	125
2200	335	435	564	584	132
2300	368	474	615	639	139
2400	398	517	669	695	146
2500	434	559	723	754	153
2600	469	604	783	815	162
2700	505	652	844	878	172
2800	541	700	904	945	183
2900	595	760	965	1012	195
3000	650	830	1030	1086	210
3100	662	858	1102	1158	230
3200	704	913	1175	1233	235
3300	750	970	1248	1312	245
3400	794	1031	1326	1391	255
3500	841	1091	1403	1475	265
3600	890	1156	1483	1559	275
3700	940	1218	1570	1646	285
3800	991	1283	1657	1737	295
3900	1041	1353	1743	1828	305
4000	1095	1420	1832	1921	315

9. FITTINGS

Future Pipe Industries has established a standardized line of GRP fittings. The most common fittings are (Elbows, Reducers, Tees, Wyes and Flanges) and can be supplied either as standard pieces or custom designed spools making it easier for the erection contractor to install.

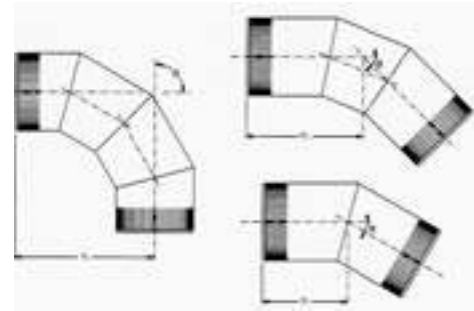


Fittings are jointed to GRP pipes with standard double bell couplings and require thrust blocks for pressure systems. Please refer to "FIBERSTRONG® Installation Guide for Underground Pipe System" for further details on proper construction of thrust blocks.



The method of fabrication of all GRP fittings is essentially the same. Pipes, after plant hydro-testing, are cut to the required dimensions. Pipe sections are then jointed together by lamination. The thickness and width of the lamination is designed to exceed the pipe performance.

A. ELBOWS

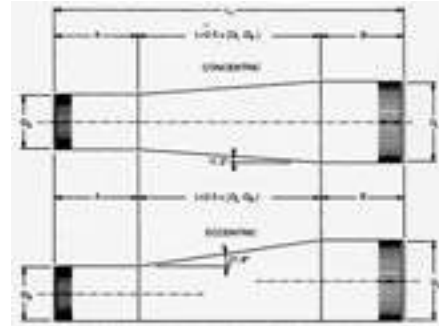


Mitered Elbows. Effective Laying Length (mm) = BL
The below dimensions are valid for all pressure classes

Angle α	1° to 15°	16° to 30°	31° to 45°	46° to 60°	61° to 90°
DN	# of Mitres	# of Mitres	# of Mitres	# of Mitres	# of Mitres
(mm)	1	1	2	2	3
80	250	250	250	300	350
100	250	250	250	300	350
150	250	250	300	300	400
200	300	300	350	400	500
250	300	300	400	450	600
300	375	425	500	550	725
350	400	450	525	600	825
400	425	475	575	625	900
450	450	525	600	700	975
500	450	525	625	700	1025
600	375	475	600	700	1075
700	375	475	625	750	1200
800	400	525	700	825	1350
900	425	550	750	900	1475
1000	450	600	800	975	1625
1100	475	625	850	1050	1750
1200	475	650	925	1125	1900
1300	500	700	975	1200	2025
1400	525	725	1025	1275	2175
1500	575	775	1100	1375	2325
1600	575	800	1150	1425	2450
1700	575	825	1175	1475	2550
1800	575	850	1225	1550	2675
1900	600	875	1275	1600	2800
2000	625	900	1325	1700	2950

Angle α	1° to 15°	16° to 30°	31° to 45°	46° to 60°	61° to 90°
DN	# of Mitres	# of Mitres	# of Mitres	# of Mitres	# of Mitres
(mm)	1	1	2	2	3
2100	625	925	1375	1750	3075
2200	625	950	1425	1800	3200
2300	650	975	1475	1875	3325
2400	675	1025	1525	1950	3475
2500	700	1075	1600	2050	3625
2600	725	1125	1675	2125	3775
2700	775	1150	1725	2200	3925
2800	775	1175	1775	2275	4050
2900	800	1225	1850	2350	4200
3000	825	1250	1875	2425	4325
3100	825	1050	1925	2475	4450
3200	850	1075	2000	2575	4600
3300	875	1100	2050	2625	4725
3400	900	1125	2100	2725	4875
3500	900	1150	2150	2775	5000
3600	925	1200	2225	2850	5150
3700	950	1200	2275	2925	5275
3800	975	1250	2325	3000	5425
3900	975	1250	2375	3075	5550
4000	975	1275	2425	3125	5650

B. REDUCERS



Concentric and Eccentric Reducers. Taper Length (L) = 2.5 x (D_L - D_S)
The below dimensions are valid for all pressure classes

DN Large End	DN Small End	Pipe length	Taper Length	Pipe Length	Laying Length
DL(mm)	Ds(mm)	A (mm)	L(mm)	B (mm)	LL(mm)
150	80	200	175	200	575
150	100	200	125	200	525
200	80	250	300	200	750
200	100	250	250	200	700
200	150	250	125	200	575
250	80	250	425	200	875
250	100	250	375	200	825
250	150	250	250	250	750
250	200	250	125	250	625
300	100	350	500	200	1,050
300	150	350	375	200	925
300	200	350	250	350	950
300	250	350	125	350	825
350	100	400	625	200	1,225
350	150	400	500	200	1,100
350	200	400	375	350	1,125
350	250	400	250	350	1,000
350	300	400	125	350	875
400	100	400	750	200	1,350
400	150	400	625	200	1,225
400	200	400	500	350	1,250
400	250	400	375	350	1,125
400	300	400	250	350	1,000
400	350	400	125	400	925
450	150	400	750	200	1,350
450	200	400	625	350	1,375

DN Large End	DN Small End	Pipe length	Taper Length	Pipe Length	Laying Length
DL(mm)	Ds(mm)	A (mm)	L(mm)	B (mm)	LL(mm)
450	250	400	500	350	1,250
450	300	400	375	350	1,125
450	350	400	250	400	1,050
450	400	400	125	400	925
500	200	400	750	350	1,500
500	250	400	625	350	1,375
500	300	400	500	350	1,250
500	350	400	375	400	1,175
500	400	400	250	400	1,050
500	450	400	125	400	925
600	300	500	750	350	1,600
600	400	500	500	400	1,400
600	450	500	375	400	1,275
600	500	500	250	400	1,150
700	400	500	750	400	1,650
700	450	500	625	400	1,525
700	500	500	500	400	1,400
700	600	500	250	500	1,250
800	500	500	750	400	1,650
800	600	500	500	500	1,500
800	700	500	250	500	1,250
900	600	500	750	500	1,750
900	700	500	500	500	1,500
900	800	500	250	500	1,250
1,000	700	500	750	500	1,750
1,000	800	500	500	500	1,500
1,000	900	500	250	500	1,250
1,100	800	500	750	500	1,750
1,100	900	500	500	500	1,500
1,100	1,000	500	250	500	1,250
1,200	900	500	750	500	1,750
1,200	1,000	500	500	500	1,500
1,200	1,100	500	250	500	1,250
1,300	1,000	500	750	500	1,750
1,300	1,100	500	500	500	1,500
1,300	1,200	500	250	500	1,250

DN Large End	DN Small End	Pipe length	Taper Length	Pipe Length	Laying Length
DL(mm)	Ds(mm)	A (mm)	L(mm)	B (mm)	LL(mm)
1,400	1,100	500	750	500	1,750
1,400	1,200	500	500	500	1,500
1,400	1,300	500	250	500	1,250
1,500	1,200	500	750	500	1,750
1,500	1,300	500	500	500	1,500
1,500	1,400	500	250	500	1,250
1,600	1,300	600	750	500	1,850
1,600	1,400	600	500	500	1,600
1,600	1,500	600	250	500	1,350
1,700	1,400	600	750	500	1,850
1,700	1,500	600	500	500	1,600
1,700	1,600	600	250	600	1,450
1,800	1,500	600	750	500	1,850
1,800	1,600	600	500	600	1,700
1,800	1,700	600	250	600	1,450
1,900	1,600	600	750	600	1,950
1,900	1,700	600	500	600	1,700
1,900	1,800	600	250	600	1,450
2,000	1,700	600	750	600	1,950
2,000	1,800	600	500	600	1,700
2,000	1,900	600	250	600	1,450
2,100	1,800	750	750	600	2,100
2,100	1,900	750	500	600	1,850
2,100	2,000	750	250	600	1,600
2,200	1,900	750	750	600	2,100
2,200	2,000	750	500	600	1,850
2,200	2,100	750	250	750	1,750
2,300	2,000	750	750	600	2,100
2,300	2,100	750	500	750	2,000
2,300	2,200	750	250	750	1,750
2,400	2,100	750	750	750	2,250
2,400	2,200	750	500	750	2,000
2,400	2,300	750	250	750	1,750
2,500	2,200	750	750	750	2,250
2,500	2,300	750	500	750	2,000
2,500	2,400	750	250	750	1,750

DN Large End	DN Small End	Pipe length	Taper Length	Pipe Length	Laying Length
DL(mm)	Ds(mm)	A (mm)	L(mm)	B (mm)	LL(mm)
2,600	2,300	750	750	750	2,250
2,600	2,400	750	500	750	2,000
2,600	2,500	750	250	750	1,750
2,800	2,500	750	750	750	2,250
2,800	2,600	750	500	750	2,000
2,800	2,700	750	250	750	1,750
3,000	2,700	750	750	750	2,250
3,000	2,800	750	500	750	2,000
3,000	2,900	750	250	750	1,750
3,100	2,800	750	750	750	2,250
3,100	2,900	750	500	750	2,000
3,100	3,000	750	250	750	1,750
3,200	2,900	750	750	750	2,250
3,200	3,000	750	500	750	2,000
3,200	3,100	750	250	750	1,750
3,300	3,000	750	750	750	2,250
3,300	3,100	750	500	750	2,000
3,300	3,200	750	250	750	1,750
3,400	3,100	750	750	750	2,250
3,400	3,200	750	500	750	2,000
3,400	3,300	750	250	750	1,750
3,500	3,200	750	750	750	2,250
3,500	3,300	750	500	750	2,000
3,500	3,400	750	250	750	1,750
3,600	3,300	750	750	750	2,250
3,600	3,400	750	500	750	2,000
3,600	3,500	750	250	750	1,750
3,700	3,400	750	750	750	2,250
3,700	3,500	750	500	750	2,000
3,700	3,600	750	250	750	1,750
3,800	3,500	750	750	750	2,250
3,800	3,600	750	500	750	2,000
3,800	3,700	750	250	750	1,750
3,900	3,600	750	750	750	2,250
3,900	3,700	750	500	750	2,000
3,900	3,800	750	250	750	1,750

DN Large End	DN Small End	Pipe length	Taper Length	Pipe Length	Laying Length
DL(mm)	Ds(mm)	A (mm)	L(mm)	B (mm)	LL(mm)
4,000	3,700	750	750	750	2,250
4,000	3,800	750	500	750	2,000
4,000	3,900	750	250	750	1,750

C. TEES



TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
80	80	520	260	520	260	520	260	520	260
100	80	520	270	520	270	520	270	520	270
100	100	540	270	540	270	540	270	540	270
150	80	520	290	520	290	520	290	520	290
150	100	540	290	540	290	540	290	540	290
150	150	580	290	580	290	580	290	580	290
200	80	520	320	520	320	520	320	520	320
200	100	540	320	540	320	540	320	540	320
200	150	580	320	580	320	580	320	580	320
200	200	640	320	640	320	660	330	660	330
250	100	540	340	540	340	540	340	540	340
250	150	580	340	580	340	580	340	580	340
250	200	640	340	640	340	660	350	660	360
250	250	680	340	700	350	740	370	760	380
300	150	580	370	580	370	580	370	580	370
300	200	640	370	640	370	660	380	660	390
300	250	680	370	700	380	740	400	760	410
300	300	740	370	780	390	820	410	840	420
350	150	720	400	720	400	720	400	720	400
350	200	780	400	780	400	800	410	800	410
350	250	820	400	840	400	880	420	900	430
350	300	880	400	900	410	960	440	980	450

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
350	350	940	470	980	490	1,040	520	1,060	530
400	150	720	420	720	420	720	420	720	420
400	200	780	420	780	420	800	430	800	440
400	250	820	420	840	430	880	450	900	460
400	300	880	420	900	440	960	460	980	470
400	350	940	490	980	510	1,040	540	1,060	550
400	400	1,000	500	1,040	520	1,100	550	1,140	570
450	200	780	450	780	450	800	460	800	460
450	250	820	450	840	450	880	470	900	480
450	300	880	450	900	460	960	490	980	500
450	350	940	520	980	540	1,040	570	1,060	580
450	400	1,000	530	1,040	550	1,100	580	1,140	600
450	450	1,080	540	1,140	570	1,200	600	1,240	620
500	200	780	470	780	470	800	480	800	490
500	250	820	470	840	480	880	500	900	510
500	300	880	470	900	490	960	510	980	520
500	350	940	550	980	570	1,040	600	1,060	610
500	400	1,000	560	1,040	580	1,100	610	1,140	620
500	450	1,080	570	1,140	590	1,200	620	1,240	640
500	500	1,140	570	1,200	600	1,280	640	1,320	660
600	250	880	530	900	530	940	550	960	560
600	300	940	530	960	540	1,020	570	1,040	580
600	400	1,060	610	1,100	630	1,160	660	1,200	670
600	450	1,140	620	1,200	640	1,260	670	1,300	690
600	500	1,200	620	1,260	650	1,340	690	1,380	710
600	600	1,340	670	1,400	700	1,500	750	1,540	770
700	300	940	580	960	590	1,020	620	1,040	630
700	400	1,060	660	1,100	680	1,160	710	1,200	730
700	450	1,140	670	1,200	700	1,260	730	1,300	750
700	500	1,200	680	1,260	710	1,340	740	1,380	760
700	600	1,340	720	1,400	760	1,500	800	1,540	820
700	700	1,480	740	1,560	780	1,660	830	1,720	860
800	300	940	630	960	650	1,020	670	1,040	680
800	400	1,060	710	1,100	730	1,160	760	1,200	780
800	450	1,140	720	1,200	750	1,260	780	1,300	800

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
800	500	1,200	730	1,260	760	1,340	790	1,380	810
800	600	1,340	770	1,400	810	1,500	850	1,540	870
800	700	1,480	790	1,560	830	1,660	880	1,720	910
800	800	1,600	800	1,700	850	1,820	910	1,880	940
900	300	940	680	960	700	1,020	720	1,040	730
900	400	1,060	760	1,100	780	1,160	810	1,200	830
900	450	1,140	770	1,200	800	1,260	830	1,300	850
900	500	1,200	780	1,260	810	1,340	840	1,380	860
900	600	1,340	820	1,400	860	1,500	900	1,540	920
900	700	1,480	840	1,560	880	1,660	930	1,720	960
900	800	1,600	850	1,700	900	1,820	960	1,880	990
900	900	1,740	870	1,840	920	1,980	990	2,040	1,020
1,000	300	1,040	730	1,060	750	1,120	770	1,140	780
1,000	400	1,160	820	1,200	840	1,260	870	1,300	880
1,000	450	1,240	830	1,300	850	1,360	880	1,400	900
1,000	500	1,300	830	1,360	860	1,440	900	1,480	920
1,000	600	1,440	880	1,500	910	1,600	960	1,640	980
1,000	700	1,580	890	1,660	930	1,760	990	1,820	1,010
1,000	800	1,700	910	1,800	950	1,920	1,010	1,980	1,040
1,000	900	1,840	930	1,940	980	2,080	1,040	2,140	1,080
1,000	1,000	1,980	990	2,100	1,050	2,240	1,120	2,320	1,160
1,100	300	1,040	790	1,060	800	1,120	830	1,140	840
1,100	400	1,160	870	1,200	890	1,260	920	1,300	930
1,100	450	1,240	880	1,300	900	1,360	930	1,400	950
1,100	500	1,300	880	1,360	910	1,440	950	1,480	970
1,100	600	1,440	930	1,500	960	1,600	1,010	1,640	1,030
1,100	700	1,580	940	1,660	980	1,760	1,040	1,820	1,060
1,100	800	1,700	960	1,800	1,000	1,920	1,060	1,980	1,090
1,100	900	1,840	980	1,940	1,030	2,080	1,090	2,140	1,130
1,100	1,000	1,980	1,040	2,100	1,100	2,240	1,170	2,320	1,210
1,100	1,100	2,120	1,060	2,240	1,120	2,400	1,200	2,480	1,240
1,200	300	1,040	840	1,060	850	1,120	880	1,140	890
1,200	400	1,160	920	1,200	940	1,260	970	1,300	990
1,200	450	1,240	930	1,300	960	1,360	990	1,400	1,010
1,200	500	1,300	940	1,360	970	1,440	1,000	1,480	1,020

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1,200	600	1,440	980	1,500	1,020	1,600	1,060	1,640	1,080
1,200	700	1,580	1,000	1,660	1,040	1,760	1,090	1,820	1,120
1,200	800	1,700	1,010	1,800	1,060	1,920	1,120	1,980	1,150
1,200	900	1,840	1,030	1,940	1,080	2,080	1,150	2,140	1,180
1,200	1,000	1,980	1,100	2,100	1,150	2,240	1,230	2,320	1,260
1,200	1,100	2,120	1,110	2,240	1,170	2,400	1,260	2,480	1,300
1,200	1,200	2,260	1,130	2,380	1,190	2,560	1,280	2,660	1,330
1,300	300	1,040	890	1,060	910	1,120	930	1,140	940
1,300	400	1,160	970	1,200	990	1,260	1,020	1,300	1,040
1,300	450	1,240	980	1,300	1,010	1,360	1,040	1,400	1,060
1,300	500	1,300	990	1,360	1,020	1,440	1,050	1,480	1,070
1,300	600	1,440	1,030	1,500	1,070	1,600	1,110	1,640	1,130
1,300	700	1,580	1,050	1,660	1,090	1,760	1,140	1,820	1,170
1,300	800	1,700	1,060	1,800	1,110	1,920	1,170	1,980	1,200
1,300	900	1,840	1,080	1,940	1,130	2,080	1,200	2,140	1,230
1,300	1,000	1,980	1,150	2,100	1,200	2,240	1,280	2,320	1,310
1,300	1,100	2,120	1,160	2,240	1,220	2,400	1,310	2,480	1,350
1,300	1,200	2,260	1,180	2,380	1,240	2,560	1,330	2,660	1,380
1,300	1,300	2,380	1,190	2,540	1,270	2,720	1,360	2,820	1,410
1,400	300	1,040	940	1,060	960	1,120	980	1,140	990
1,400	400	1,160	1,020	1,200	1,040	1,260	1,070	1,300	1,090
1,400	450	1,240	1,030	1,300	1,060	1,360	1,090	1,400	1,110
1,400	500	1,300	1,040	1,360	1,070	1,440	1,100	1,480	1,120
1,400	600	1,440	1,080	1,500	1,120	1,600	1,160	1,640	1,180
1,400	700	1,580	1,100	1,660	1,140	1,760	1,190	1,820	1,220
1,400	800	1,700	1,110	1,800	1,160	1,920	1,220	1,980	1,250
1,400	900	1,840	1,130	1,940	1,180	2,080	1,250	2,140	1,280
1,400	1,000	1,980	1,200	2,100	1,250	2,240	1,330	2,320	1,360
1,400	1,100	2,120	1,210	2,240	1,270	2,400	1,360	2,480	1,400
1,400	1,200	2,260	1,230	2,380	1,290	2,560	1,380	2,660	1,430
1,400	1,300	2,380	1,240	2,540	1,320	2,720	1,410	2,820	1,460
1,400	1,400	2,520	1,260	2,680	1,340	2,880	1,440	2,980	1,490
1,500	300	1,040	990	1,060	1,010	1,120	1,030	1,140	1,040
1,500	400	1,160	1,080	1,200	1,100	1,260	1,130	1,300	1,140
1,500	450	1,240	1,090	1,300	1,110	1,360	1,140	1,400	1,160

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1,500	500	1,300	1,090	1,360	1,120	1,440	1,160	1,480	1,180
1,500	600	1,440	1,140	1,500	1,170	1,600	1,220	1,640	1,240
1,500	700	1,580	1,150	1,660	1,190	1,760	1,250	1,820	1,270
1,500	800	1,700	1,170	1,800	1,210	1,920	1,270	1,980	1,300
1,500	900	1,840	1,190	1,940	1,240	2,080	1,300	2,140	1,340
1,500	1,000	1,980	1,250	2,100	1,310	2,240	1,380	2,320	1,420
1,500	1,100	2,120	1,270	2,240	1,330	2,400	1,410	2,480	1,450
1,500	1,200	2,260	1,280	2,380	1,350	2,560	1,440	2,660	1,480
1,500	1,300	2,380	1,300	2,540	1,370	2,720	1,470	2,820	1,520
1,500	1,400	2,520	1,310	2,680	1,390	2,880	1,500	2,980	1,550
1,500	1,500	2,660	1,330	2,820	1,410	3,060	1,530	3,160	1,580
1,600	300	1,040	1,050	1,060	1,060	1,120	1,090	1,140	1,100
1,600	400	1,160	1,130	1,200	1,150	1,260	1,180	1,300	1,190
1,600	450	1,240	1,140	1,300	1,160	1,360	1,190	1,400	1,210
1,600	500	1,300	1,140	1,360	1,170	1,440	1,210	1,480	1,230
1,600	600	1,440	1,190	1,500	1,220	1,600	1,270	1,640	1,290
1,600	700	1,580	1,200	1,660	1,240	1,760	1,300	1,820	1,320
1,600	800	1,700	1,220	1,800	1,260	1,920	1,320	1,980	1,350
1,600	900	1,840	1,240	1,940	1,290	2,080	1,350	2,140	1,390
1,600	1,000	1,980	1,300	2,100	1,360	2,240	1,430	2,320	1,470
1,600	1,100	2,120	1,320	2,240	1,380	2,400	1,460	2,480	1,500
1,600	1,200	2,260	1,330	2,380	1,400	2,560	1,490	2,660	1,530
1,600	1,300	2,380	1,350	2,540	1,420	2,720	1,520	2,820	1,570
1,600	1,400	2,520	1,360	2,680	1,440	2,880	1,550	2,980	1,600
1,600	1,500	2,660	1,380	2,820	1,460	3,060	1,580	3,160	1,630
1,600	1,600	2,780	1,390	2,960	1,480	3,200	1,600	3,320	1,660
1,700	300	1,040	1,100	1,060	1,110	1,120	1,140	1,140	1,150
1,700	400	1,160	1,180	1,200	1,200	1,260	1,230	1,300	1,250
1,700	450	1,240	1,190	1,300	1,220	1,360	1,250	1,400	1,270
1,700	500	1,300	1,200	1,360	1,230	1,440	1,260	1,480	1,280
1,700	600	1,440	1,240	1,500	1,280	1,600	1,320	1,640	1,340
1,700	700	1,580	1,260	1,660	1,300	1,760	1,350	1,820	1,380
1,700	800	1,700	1,270	1,800	1,320	1,920	1,380	1,980	1,410
1,700	900	1,840	1,290	1,940	1,340	2,080	1,410	2,140	1,440
1,700	1,000	1,980	1,360	2,100	1,410	2,240	1,490	2,320	1,520

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1,700	1,100	2,120	1,370	2,240	1,430	2,400	1,520	2,480	1,560
1,700	1,200	2,260	1,390	2,380	1,450	2,560	1,540	2,660	1,590
1,700	1,300	2,380	1,400	2,540	1,480	2,720	1,570	2,820	1,620
1,700	1,400	2,520	1,420	2,680	1,500	2,880	1,600	2,980	1,650
1,700	1,500	2,660	1,430	2,820	1,520	3,060	1,630	3,160	1,690
1,700	1,600	2,780	1,450	2,960	1,540	3,200	1,660	3,320	1,720
1,700	1,700	2,940	1,470	3,120	1,560	3,380	1,690	3,500	1,750
1,800	300	1,040	1,150	1,060	1,170	1,120	1,190	1,140	1,200
1,800	400	1,160	1,230	1,200	1,250	1,260	1,280	1,300	1,300
1,800	450	1,240	1,240	1,300	1,270	1,360	1,300	1,400	1,320
1,800	500	1,300	1,250	1,360	1,280	1,440	1,310	1,480	1,330
1,800	600	1,440	1,290	1,500	1,330	1,600	1,370	1,640	1,390
1,800	700	1,580	1,310	1,660	1,350	1,760	1,400	1,820	1,430
1,800	800	1,700	1,320	1,800	1,370	1,920	1,430	1,980	1,460
1,800	900	1,840	1,340	1,940	1,390	2,080	1,460	2,140	1,490
1,800	1,000	1,980	1,410	2,100	1,460	2,240	1,540	2,320	1,570
1,800	1,100	2,120	1,420	2,240	1,480	2,400	1,570	2,480	1,610
1,800	1,200	2,260	1,440	2,380	1,500	2,560	1,590	2,660	1,640
1,800	1,300	2,380	1,450	2,540	1,530	2,720	1,620	2,820	1,670
1,800	1,400	2,520	1,470	2,680	1,550	2,880	1,650	2,980	1,700
1,800	1,500	2,660	1,480	2,820	1,570	3,060	1,680	3,160	1,740
1,800	1,600	2,780	1,500	2,960	1,590	3,200	1,710	3,320	1,770
1,800	1,700	2,940	1,520	3,120	1,610	3,380	1,740	3,500	1,800
1,800	1,800	3,060	1,530	3,260	1,630	3,540	1,770	3,660	1,830
1,900	300	1,040	1,200	1,060	1,220	1,120	1,240	1,140	1,250
1,900	400	1,160	1,280	1,200	1,300	1,260	1,330	1,300	1,350
1,900	450	1,240	1,290	1,300	1,320	1,360	1,350	1,400	1,370
1,900	500	1,300	1,300	1,360	1,330	1,440	1,360	1,480	1,380
1,900	600	1,440	1,340	1,500	1,380	1,600	1,420	1,640	1,440
1,900	700	1,580	1,360	1,660	1,400	1,760	1,450	1,820	1,480
1,900	800	1,700	1,370	1,800	1,420	1,920	1,480	1,980	1,510
1,900	900	1,840	1,390	1,940	1,440	2,080	1,510	2,140	1,540
1,900	1,000	1,980	1,460	2,100	1,510	2,240	1,590	2,320	1,620
1,900	1,100	2,120	1,470	2,240	1,530	2,400	1,620	2,480	1,660
1,900	1,200	2,260	1,490	2,380	1,550	2,560	1,640	2,660	1,690

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1,900	1,300	2,380	1,500	2,540	1,580	2,720	1,670	2,820	1,720
1,900	1,400	2,520	1,520	2,680	1,600	2,880	1,700	2,980	1,750
1,900	1,500	2,660	1,530	2,820	1,620	3,060	1,730	3,160	1,790
1,900	1,600	2,780	1,550	2,960	1,640	3,200	1,760	3,320	1,820
1,900	1,700	2,940	1,570	3,120	1,660	3,380	1,790	3,500	1,850
1,900	1,800	3,060	1,580	3,260	1,680	3,540	1,820	3,660	1,880
1,900	1,900	3,200	1,600	3,400	1,700	3,700	1,850	3,840	1,920
2,000	300	1,140	1,250	1,160	1,270	1,220	1,290	1,240	1,300
2,000	400	1,260	1,340	1,300	1,360	1,360	1,390	1,400	1,400
2,000	450	1,340	1,350	1,400	1,370	1,460	1,400	1,500	1,420
2,000	500	1,400	1,350	1,460	1,380	1,540	1,420	1,580	1,440
2,000	600	1,540	1,400	1,600	1,430	1,700	1,480	1,740	1,500
2,000	700	1,680	1,410	1,760	1,450	1,860	1,510	1,920	1,530
2,000	800	1,800	1,430	1,900	1,470	2,020	1,530	2,080	1,560
2,000	900	1,940	1,450	2,040	1,500	2,180	1,560	2,240	1,600
2,000	1,000	2,080	1,510	2,200	1,570	2,340	1,640	2,420	1,680
2,000	1,100	2,220	1,530	2,340	1,590	2,500	1,670	2,580	1,710
2,000	1,200	2,360	1,540	2,480	1,610	2,660	1,700	2,760	1,740
2,000	1,300	2,480	1,560	2,640	1,630	2,820	1,730	2,920	1,780
2,000	1,400	2,620	1,570	2,780	1,650	2,980	1,760	3,080	1,810
2,000	1,500	2,760	1,590	2,920	1,670	3,160	1,790	3,260	1,840
2,000	1,600	2,880	1,600	3,060	1,690	3,300	1,810	3,420	1,870
2,000	1,700	3,040	1,620	3,220	1,720	3,480	1,840	3,600	1,910
2,000	1,800	3,160	1,640	3,360	1,740	3,640	1,870	3,760	1,940
2,000	1,900	3,300	1,650	3,500	1,760	3,800	1,900	3,940	1,970
2,000	2,000	3,440	1,720	3,660	1,830	3,960	1,980	4,100	2,050
2,100	300	1,140	1,310	1,160	1,320	1,220	1,350	1,240	1,360
2,100	400	1,260	1,390	1,300	1,410	1,360	1,440	1,400	1,450
2,100	450	1,340	1,400	1,400	1,420	1,460	1,450	1,500	1,470
2,100	500	1,400	1,400	1,460	1,430	1,540	1,470	1,580	1,490
2,100	600	1,540	1,450	1,600	1,480	1,700	1,530	1,740	1,550
2,100	700	1,680	1,460	1,760	1,500	1,860	1,560	1,920	1,580
2,100	800	1,800	1,480	1,900	1,520	2,020	1,580	2,080	1,610
2,100	900	1,940	1,500	2,040	1,550	2,180	1,610	2,240	1,650
2,100	1,000	2,080	1,560	2,200	1,620	2,340	1,690	2,420	1,730

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2,100	1,100	2,220	1,580	2,340	1,640	2,500	1,720	2,580	1,760
2,100	1,200	2,360	1,590	2,480	1,660	2,660	1,750	2,760	1,790
2,100	1,300	2,480	1,610	2,640	1,680	2,820	1,780	2,920	1,830
2,100	1,400	2,620	1,620	2,780	1,700	2,980	1,810	3,080	1,860
2,100	1,500	2,760	1,640	2,920	1,720	3,160	1,840	3,260	1,890
2,100	1,600	2,880	1,650	3,060	1,740	3,300	1,860	3,420	1,920
2,100	1,700	3,040	1,670	3,220	1,770	3,480	1,890	3,600	1,960
2,100	1,800	3,160	1,690	3,360	1,790	3,640	1,920	3,760	1,990
2,100	1,900	3,300	1,700	3,500	1,810	3,800	1,950	3,940	2,020
2,100	2,000	3,440	1,770	3,660	1,880	3,960	2,030	4,100	2,100
2,100	2,100	3,560	1,780	3,800	1,900	4,120	2,060	4,280	2,140
2,200	300	1,140	1,360	1,160	1,370	1,220	1,400	1,240	1,410
2,200	400	1,260	1,440	1,300	1,460	1,360	1,490	1,400	1,510
2,200	450	1,340	1,450	1,400	1,480	1,460	1,510	1,500	1,530
2,200	500	1,400	1,460	1,460	1,490	1,540	1,520	1,580	1,540
2,200	600	1,540	1,500	1,600	1,540	1,700	1,580	1,740	1,600
2,200	700	1,680	1,520	1,760	1,560	1,860	1,610	1,920	1,640
2,200	800	1,800	1,530	1,900	1,580	2,020	1,640	2,080	1,670
2,200	900	1,940	1,550	2,040	1,600	2,180	1,670	2,240	1,700
2,200	1,000	2,080	1,620	2,200	1,670	2,340	1,750	2,420	1,780
2,200	1,100	2,220	1,630	2,340	1,690	2,500	1,780	2,580	1,820
2,200	1,200	2,360	1,650	2,480	1,710	2,660	1,800	2,760	1,850
2,200	1,300	2,480	1,660	2,640	1,740	2,820	1,830	2,920	1,880
2,200	1,400	2,620	1,680	2,780	1,760	2,980	1,860	3,080	1,910
2,200	1,500	2,760	1,690	2,920	1,780	3,160	1,890	3,260	1,950
2,200	1,600	2,880	1,710	3,060	1,800	3,300	1,920	3,420	1,980
2,200	1,700	3,040	1,730	3,220	1,820	3,480	1,950	3,600	2,010
2,200	1,800	3,160	1,740	3,360	1,840	3,640	1,980	3,760	2,040
2,200	1,900	3,300	1,760	3,500	1,860	3,800	2,010	3,940	2,080
2,200	2,000	3,440	1,820	3,660	1,930	3,960	2,080	4,100	2,160
2,200	2,100	3,560	1,840	3,800	1,960	4,120	2,110	4,280	2,190
2,200	2,200	3,700	1,850	3,960	1,980	4,280	2,140	4,440	2,220
2,300	300	1,140	1,410	1,160	1,430	1,220	1,450	1,240	1,460
2,300	400	1,260	1,490	1,300	1,510	1,360	1,540	1,400	1,560
2,300	450	1,340	1,500	1,400	1,530	1,460	1,560	1,500	1,580

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2,300	500	1,400	1,510	1,460	1,540	1,540	1,570	1,580	1,590
2,300	600	1,540	1,550	1,600	1,590	1,700	1,630	1,740	1,650
2,300	700	1,680	1,570	1,760	1,610	1,860	1,660	1,920	1,690
2,300	800	1,800	1,580	1,900	1,630	2,020	1,690	2,080	1,720
2,300	900	1,940	1,600	2,040	1,650	2,180	1,720	2,240	1,750
2,300	1,000	2,080	1,670	2,200	1,720	2,340	1,800	2,420	1,830
2,300	1,100	2,220	1,680	2,340	1,740	2,500	1,830	2,580	1,870
2,300	1,200	2,360	1,700	2,480	1,760	2,660	1,850	2,760	1,900
2,300	1,300	2,480	1,710	2,640	1,790	2,820	1,880	2,920	1,930
2,300	1,400	2,620	1,730	2,780	1,810	2,980	1,910	3,080	1,960
2,300	1,500	2,760	1,740	2,920	1,830	3,160	1,940	3,260	2,000
2,300	1,600	2,880	1,760	3,060	1,850	3,300	1,970	3,420	2,030
2,300	1,700	3,040	1,780	3,220	1,870	3,480	2,000	3,600	2,060
2,300	1,800	3,160	1,790	3,360	1,890	3,640	2,030	3,760	2,090
2,300	1,900	3,300	1,810	3,500	1,910	3,800	2,060	3,940	2,130
2,300	2,000	3,440	1,870	3,660	1,980	3,960	2,130	4,100	2,210
2,300	2,100	3,560	1,890	3,800	2,010	4,120	2,160	4,280	2,240
2,300	2,200	3,700	1,900	3,960	2,030	4,280	2,190	4,440	2,270
2,300	2,300	3,840	1,920	4,100	2,050	4,440	2,220	4,620	2,310
2,400	300	1,140	1,460	1,160	1,480	1,220	1,500	1,240	1,510
2,400	400	1,260	1,540	1,300	1,560	1,360	1,590	1,400	1,610
2,400	450	1,340	1,550	1,400	1,580	1,460	1,610	1,500	1,630
2,400	500	1,400	1,560	1,460	1,590	1,540	1,620	1,580	1,640
2,400	600	1,540	1,600	1,600	1,640	1,700	1,680	1,740	1,700
2,400	700	1,680	1,620	1,760	1,660	1,860	1,710	1,920	1,740
2,400	800	1,800	1,630	1,900	1,680	2,020	1,740	2,080	1,770
2,400	900	1,940	1,650	2,040	1,700	2,180	1,770	2,240	1,800
2,400	1,000	2,080	1,720	2,200	1,770	2,340	1,850	2,420	1,880
2,400	1,100	2,220	1,730	2,340	1,790	2,500	1,880	2,580	1,920
2,400	1,200	2,360	1,750	2,480	1,810	2,660	1,900	2,760	1,950
2,400	1,300	2,480	1,760	2,640	1,840	2,820	1,930	2,920	1,980
2,400	1,400	2,620	1,780	2,780	1,860	2,980	1,960	3,080	2,010
2,400	1,500	2,760	1,790	2,920	1,880	3,160	1,990	3,260	2,050
2,400	1,600	2,880	1,810	3,060	1,900	3,300	2,020	3,420	2,080
2,400	1,700	3,040	1,830	3,220	1,920	3,480	2,050	3,600	2,110

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2,400	1,800	3,160	1,840	3,360	1,940	3,640	2,080	3,760	2,140
2,400	1,900	3,300	1,860	3,500	1,960	3,800	2,110	3,940	2,180
2,400	2,000	3,440	1,920	3,660	2,030	3,960	2,180	4,100	2,260
2,400	2,100	3,560	1,940	3,800	2,060	4,120	2,210	4,280	2,290
2,400	2,200	3,700	1,950	3,960	2,080	4,280	2,240	4,440	2,320
2,400	2,300	3,840	1,970	4,100	2,100	4,440	2,270	4,620	2,360
2,400	2,400	3,960	1,980	4,240	2,120	4,600	2,300	4,780	2,390
2,500	300	1,140	1,510	1,160	1,530	1,220	1,550	1,240	1,560
2,500	400	1,260	1,600	1,300	1,620	1,360	1,650	1,400	1,660
2,500	450	1,340	1,610	1,400	1,630	1,460	1,660	1,500	1,680
2,500	500	1,400	1,610	1,460	1,640	1,540	1,680	1,580	1,700
2,500	600	1,540	1,660	1,600	1,690	1,700	1,740	1,740	1,760
2,500	700	1,680	1,670	1,760	1,710	1,860	1,770	1,920	1,790
2,500	800	1,800	1,690	1,900	1,730	2,020	1,790	2,080	1,820
2,500	900	1,940	1,710	2,040	1,760	2,180	1,820	2,240	1,860
2,500	1,000	2,080	1,770	2,200	1,830	2,340	1,900	2,420	1,940
2,500	1,100	2,220	1,790	2,340	1,850	2,500	1,930	2,580	1,970
2,500	1,200	2,360	1,800	2,480	1,870	2,660	1,960	2,760	2,000
2,500	1,300	2,480	1,820	2,640	1,890	2,820	1,990	2,920	2,040
2,500	1,400	2,620	1,830	2,780	1,910	2,980	2,020	3,080	2,070
2,500	1,500	2,760	1,850	2,920	1,930	3,160	2,050	3,260	2,100
2,500	1,600	2,880	1,860	3,060	1,950	3,300	2,070	3,420	2,130
2,500	1,700	3,040	1,880	3,220	1,980	3,480	2,100	3,600	2,170
2,500	1,800	3,160	1,900	3,360	2,000	3,640	2,130	3,760	2,200
2,500	1,900	3,300	1,910	3,500	2,020	3,800	2,160	3,940	2,230
2,500	2,000	3,440	1,980	3,660	2,090	3,960	2,240	4,100	2,310
2,500	2,100	3,560	1,990	3,800	2,110	4,120	2,270	4,280	2,350
2,500	2,200	3,700	2,010	3,960	2,130	4,280	2,300	4,440	2,380
2,500	2,300	3,840	2,020	4,100	2,150	4,440	2,330	4,620	2,410
2,500	2,400	3,960	2,040	4,240	2,170	4,600	2,350	4,780	2,440
2,500	2,500	4,120	2,060	4,400	2,200	4,760	2,380	4,960	2,480
2,600	300	1,140	1,570	1,160	1,580	1,220	1,610	1,240	1,620
2,600	400	1,260	1,650	1,300	1,670	1,360	1,700	1,400	1,710
2,600	500	1,400	1,660	1,460	1,690	1,540	1,730	1,580	1,750
2,600	600	1,540	1,710	1,600	1,740	1,700	1,790	1,740	1,810

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2,600	700	1,680	1,720	1,760	1,760	1,860	1,820	1,920	1,840
2,600	800	1,800	1,740	1,900	1,780	2,020	1,840	2,080	1,870
2,600	900	1,940	1,760	2,040	1,810	2,180	1,870	2,240	1,910
2,600	1,000	2,080	1,820	2,200	1,880	2,340	1,950	2,420	1,990
2,600	1,100	2,220	1,840	2,340	1,900	2,500	1,980	2,580	2,020
2,600	1,200	2,360	1,850	2,480	1,920	2,660	2,010	2,760	2,050
2,600	1,300	2,480	1,870	2,640	1,940	2,820	2,040	2,920	2,090
2,600	1,400	2,620	1,880	2,780	1,960	2,980	2,070	3,080	2,120
2,600	1,500	2,760	1,900	2,920	1,980	3,160	2,100	3,260	2,150
2,600	1,600	2,880	1,910	3,060	2,000	3,300	2,120	3,420	2,180
2,600	1,700	3,040	1,930	3,220	2,030	3,480	2,150	3,600	2,220
2,600	1,800	3,160	1,950	3,360	2,050	3,640	2,180	3,760	2,250
2,600	1,900	3,300	1,960	3,500	2,070	3,800	2,210	3,940	2,280
2,600	2,000	3,440	2,030	3,660	2,140	3,960	2,290	4,100	2,360
2,600	2,100	3,560	2,040	3,800	2,160	4,120	2,320	4,280	2,400
2,600	2,200	3,700	2,060	3,960	2,180	4,280	2,350	4,440	2,430
2,600	2,300	3,840	2,070	4,100	2,200	4,440	2,380	4,620	2,460
2,600	2,400	3,960	2,090	4,240	2,220	4,600	2,400	4,780	2,490
2,600	2,500	4,120	2,110	4,400	2,250	4,760	2,430	4,960	2,530
2,600	2,600	4,240	2,120	4,540	2,270	4,920	2,460	5,120	2,560
2,700	300	1,140	1,620	1,160	1,630	1,220	1,660	1,240	1,670
2,700	400	1,260	1,700	1,300	1,720	1,360	1,750	1,400	1,770
2,700	450	1,340	1,710	1,400	1,740	1,460	1,770	1,500	1,790
2,700	500	1,400	1,720	1,460	1,750	1,540	1,780	1,580	1,800
2,700	600	1,540	1,760	1,600	1,800	1,700	1,840	1,740	1,860
2,700	700	1,680	1,780	1,760	1,820	1,860	1,870	1,920	1,900
2,700	800	1,800	1,790	1,900	1,840	2,020	1,900	2,080	1,930
2,700	900	1,940	1,810	2,040	1,860	2,180	1,930	2,240	1,960
2,700	1,000	2,080	1,880	2,200	1,930	2,340	2,010	2,420	2,040
2,700	1,100	2,220	1,890	2,340	1,950	2,500	2,040	2,580	2,080
2,700	1,200	2,360	1,910	2,480	1,970	2,660	2,060	2,760	2,110
2,700	1,300	2,480	1,920	2,640	2,000	2,820	2,090	2,920	2,140
2,700	1,400	2,620	1,940	2,780	2,020	2,980	2,120	3,080	2,170
2,700	1,500	2,760	1,950	2,920	2,040	3,160	2,150	3,260	2,210
2,700	1,600	2,880	1,970	3,060	2,060	3,300	2,180	3,420	2,240

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2,700	1,700	3,040	1,990	3,220	2,080	3,480	2,210	3,600	2,270
2,700	1,800	3,160	2,000	3,360	2,100	3,640	2,240	3,760	2,300
2,700	1,900	3,300	2,020	3,500	2,120	3,800	2,270	3,940	2,340
2,700	2,000	3,440	2,080	3,660	2,190	3,960	2,340	4,100	2,420
2,700	2,100	3,560	2,100	3,800	2,220	4,120	2,370	4,280	2,450
2,700	2,200	3,700	2,110	3,960	2,240	4,280	2,400	4,440	2,480
2,700	2,300	3,840	2,130	4,100	2,260	4,440	2,430	4,620	2,520
2,700	2,400	3,960	2,140	4,240	2,280	4,600	2,460	4,780	2,550
2,700	2,500	4,120	2,160	4,400	2,300	4,760	2,490	4,960	2,580
2,700	2,600	4,240	2,180	4,540	2,320	4,920	2,520	5,120	2,610
2,700	2,700	4,380	2,190	4,680	2,340	5,100	2,550	5,300	2,650
2,800	300	1,140	1,670	1,160	1,690	1,220	1,710	1,240	1,720
2,800	400	1,260	1,750	1,300	1,770	1,360	1,800	1,400	1,820
2,800	450	1,340	1,760	1,400	1,790	1,460	1,820	1,500	1,840
2,800	500	1,400	1,770	1,460	1,800	1,540	1,830	1,580	1,850
2,800	600	1,540	1,810	1,600	1,850	1,700	1,890	1,740	1,910
2,800	700	1,680	1,830	1,760	1,870	1,860	1,920	1,920	1,950
2,800	800	1,800	1,840	1,900	1,890	2,020	1,950	2,080	1,980
2,800	900	1,940	1,860	2,040	1,910	2,180	1,980	2,240	2,010
2,800	1,000	2,080	1,930	2,200	1,980	2,340	2,060	2,420	2,090
2,800	1,100	2,220	1,940	2,340	2,000	2,500	2,090	2,580	2,130
2,800	1,200	2,360	1,960	2,480	2,020	2,660	2,110	2,760	2,160
2,800	1,300	2,480	1,970	2,640	2,050	2,820	2,140	2,920	2,190
2,800	1,400	2,620	1,990	2,780	2,070	2,980	2,170	3,080	2,220
2,800	1,500	2,760	2,000	2,920	2,090	3,160	2,200	3,260	2,260
2,800	1,600	2,880	2,020	3,060	2,110	3,300	2,230	3,420	2,290
2,800	1,700	3,040	2,040	3,220	2,130	3,480	2,260	3,600	2,320
2,800	1,800	3,160	2,050	3,360	2,150	3,640	2,290	3,760	2,350
2,800	1,900	3,300	2,070	3,500	2,170	3,800	2,320	3,940	2,390
2,800	2,000	3,440	2,130	3,660	2,240	3,960	2,390	4,100	2,470
2,800	2,100	3,560	2,150	3,800	2,270	4,120	2,420	4,280	2,500
2,800	2,200	3,700	2,160	3,960	2,290	4,280	2,450	4,440	2,530
2,800	2,300	3,840	2,180	4,100	2,310	4,440	2,480	4,620	2,570
2,800	2,400	3,960	2,190	4,240	2,330	4,600	2,510	4,780	2,600
2,800	2,500	4,120	2,210	4,400	2,350	4,760	2,540	4,960	2,630

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2,800	2,600	4,240	2,230	4,540	2,370	4,920	2,570	5,120	2,660
2,800	2,700	4,380	2,240	4,680	2,390	5,100	2,600	5,300	2,700
2,800	2,800	4,520	2,260	4,820	2,410	5,240	2,620	5,460	2,730
2,900	300	1,180	1,720	1,200	1,740				
2,900	400	1,300	1,800	1,340	1,820				
2,900	450	1,380	1,810	1,440	1,840				
2,900	500	1,440	1,820	1,500	1,850				
2,900	600	1,580	1,860	1,640	1,900				
2,900	700	1,720	1,880	1,800	1,920				
2,900	800	1,840	1,890	1,940	1,940				
2,900	900	1,980	1,910	2,080	1,960				
2,900	1,000	2,120	1,980	2,240	2,030				
2,900	1,100	2,260	1,990	2,380	2,050				
2,900	1,200	2,400	2,010	2,520	2,070				
2,900	1,300	2,520	2,020	2,680	2,100				
2,900	1,400	2,660	2,040	2,820	2,120				
2,900	1,500	2,800	2,050	2,960	2,140				
2,900	1,600	2,920	2,070	3,100	2,160				
2,900	1,700	3,080	2,090	3,260	2,180				
2,900	1,800	3,200	2,100	3,400	2,200				
2,900	1,900	3,340	2,120	3,540	2,220				
2,900	2,000	3,480	2,180	3,700	2,290				
2,900	2,100	3,600	2,200	3,840	2,320				
2,900	2,200	3,740	2,210	4,000	2,340				
2,900	2,300	3,880	2,230	4,140	2,360				
2,900	2,400	4,000	2,240	4,280	2,380				
2,900	2,500	4,160	2,260	4,440	2,400				
2,900	2,600	4,280	2,280	4,580	2,420				
2,900	2,700	4,420	2,290	4,720	2,440				
2,900	2,800	4,560	2,310	4,860	2,460				
2,900	2,900	4,680	2,340	5,020	2,510				
3,000	300	1,180	1,770	1,200	1,790				
3,000	400	1,300	1,860	1,340	1,880				
3,000	450	1,380	1,870	1,440	1,890				
3,000	500	1,440	1,870	1,500	1,900				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,000	600	1,580	1,920	1,640	1,950				
3,000	700	1,720	1,930	1,800	1,970				
3,000	800	1,840	1,950	1,940	1,990				
3,000	900	1,980	1,970	2,080	2,020				
3,000	1,000	2,120	2,030	2,240	2,090				
3,000	1,100	2,260	2,050	2,380	2,110				
3,000	1,200	2,400	2,060	2,520	2,130				
3,000	1,300	2,520	2,080	2,680	2,150				
3,000	1,400	2,660	2,090	2,820	2,170				
3,000	1,500	2,800	2,110	2,960	2,190				
3,000	1,600	2,920	2,120	3,100	2,210				
3,000	1,700	3,080	2,140	3,260	2,240				
3,000	1,800	3,200	2,160	3,400	2,260				
3,000	1,900	3,340	2,170	3,540	2,280				
3,000	2,000	3,480	2,240	3,700	2,350				
3,000	2,100	3,600	2,250	3,840	2,370				
3,000	2,200	3,740	2,270	4,000	2,390				
3,000	2,300	3,880	2,280	4,140	2,410				
3,000	2,400	4,000	2,300	4,280	2,430				
3,000	2,500	4,160	2,320	4,440	2,460				
3,000	2,600	4,280	2,330	4,580	2,480				
3,000	2,700	4,420	2,350	4,720	2,500				
3,000	2,800	4,560	2,360	4,860	2,520				
3,000	2,900	4,680	2,400	5,020	2,560				
3,000	3,000	4,820	2,410	5,160	2,580				
3,100	300	1,180	1,830	1,200	1,840				
3,100	400	1,300	1,910	1,340	1,930				
3,100	450	1,380	1,920	1,440	1,940				
3,100	500	1,440	1,920	1,500	1,950				
3,100	600	1,580	1,970	1,640	2,000				
3,100	700	1,720	1,980	1,800	2,020				
3,100	800	1,840	2,000	1,940	2,040				
3,100	900	1,980	2,020	2,080	2,070				
3,100	1,000	2,120	2,080	2,240	2,140				
3,100	1,100	2,260	2,100	2,380	2,160				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,100	1,200	2,400	2,110	2,520	2,180				
3,100	1,300	2,520	2,130	2,680	2,200				
3,100	1,400	2,660	2,140	2,820	2,220				
3,100	1,500	2,800	2,160	2,960	2,240				
3,100	1,600	2,920	2,170	3,100	2,260				
3,100	1,700	3,080	2,190	3,260	2,290				
3,100	1,800	3,200	2,210	3,400	2,310				
3,100	1,900	3,340	2,220	3,540	2,330				
3,100	2,000	3,480	2,290	3,700	2,400				
3,100	2,100	3,600	2,300	3,840	2,420				
3,100	2,200	3,740	2,320	4,000	2,440				
3,100	2,300	3,880	2,330	4,140	2,460				
3,100	2,400	4,000	2,350	4,280	2,480				
3,100	2,500	4,160	2,370	4,440	2,510				
3,100	2,600	4,280	2,380	4,580	2,530				
3,100	2,700	4,420	2,400	4,720	2,550				
3,100	2,800	4,560	2,410	4,860	2,570				
3,100	2,900	4,680	2,450	5,020	2,610				
3,100	3,000	4,820	2,460	5,160	2,630				
3,100	3,100	4,960	2,480	5,300	2,650				
3,200	300	1,180	1,880	1,200	1,890				
3,200	400	1,300	1,960	1,340	1,980				
3,200	450	1,380	1,970	1,440	2,000				
3,200	500	1,440	1,980	1,500	2,010				
3,200	600	1,580	2,020	1,640	2,060				
3,200	700	1,720	2,040	1,800	2,080				
3,200	800	1,840	2,050	1,940	2,100				
3,200	900	1,980	2,070	2,080	2,120				
3,200	1,000	2,120	2,140	2,240	2,190				
3,200	1,100	2,260	2,150	2,380	2,210				
3,200	1,200	2,400	2,170	2,520	2,230				
3,200	1,300	2,520	2,180	2,680	2,260				
3,200	1,400	2,660	2,200	2,820	2,280				
3,200	1,500	2,800	2,210	2,960	2,300				
3,200	1,600	2,920	2,230	3,100	2,320				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,200	1,700	3,080	2,250	3,260	2,340				
3,200	1,800	3,200	2,260	3,400	2,360				
3,200	1,900	3,340	2,280	3,540	2,380				
3,200	2,000	3,480	2,340	3,700	2,450				
3,200	2,100	3,600	2,360	3,840	2,480				
3,200	2,200	3,740	2,370	4,000	2,500				
3,200	2,300	3,880	2,390	4,140	2,520				
3,200	2,400	4,000	2,400	4,280	2,540				
3,200	2,500	4,160	2,420	4,440	2,560				
3,200	2,600	4,280	2,440	4,580	2,580				
3,200	2,700	4,420	2,450	4,720	2,600				
3,200	2,800	4,560	2,470	4,860	2,620				
3,200	2,900	4,680	2,500	5,020	2,670				
3,200	3,000	4,820	2,520	5,160	2,690				
3,200	3,100	4,960	2,530	5,300	2,710				
3,200	3,200	5,100	2,550	5,460	2,730				
3,300	300	1,180	1,930	1,200	1,950				
3,300	400	1,300	2,010	1,340	2,030				
3,300	450	1,380	2,020	1,440	2,050				
3,300	500	1,440	2,030	1,500	2,060				
3,300	600	1,580	2,070	1,640	2,110				
3,300	700	1,720	2,090	1,800	2,130				
3,300	800	1,840	2,100	1,940	2,150				
3,300	900	1,980	2,120	2,080	2,170				
3,300	1,000	2,120	2,190	2,240	2,240				
3,300	1,100	2,260	2,200	2,380	2,260				
3,300	1,200	2,400	2,220	2,520	2,280				
3,300	1,300	2,520	2,230	2,680	2,310				
3,300	1,400	2,660	2,250	2,820	2,330				
3,300	1,500	2,800	2,260	2,960	2,350				
3,300	1,600	2,920	2,280	3,100	2,370				
3,300	1,700	3,080	2,300	3,260	2,390				
3,300	1,800	3,200	2,310	3,400	2,410				
3,300	1,900	3,340	2,330	3,540	2,430				
3,300	2,000	3,480	2,390	3,700	2,500				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,300	2,100	3,600	2,410	3,840	2,530				
3,300	2,200	3,740	2,420	4,000	2,550				
3,300	2,300	3,880	2,440	4,140	2,570				
3,300	2,400	4,000	2,450	4,280	2,590				
3,300	2,500	4,160	2,470	4,440	2,610				
3,300	2,600	4,280	2,490	4,580	2,630				
3,300	2,700	4,420	2,500	4,720	2,650				
3,300	2,800	4,560	2,520	4,860	2,670				
3,300	2,900	4,680	2,550	5,020	2,720				
3,300	3,000	4,820	2,570	5,160	2,740				
3,300	3,100	4,960	2,580	5,300	2,760				
3,300	3,200	5,100	2,600	5,460	2,780				
3,300	3,300	5,240	2,620	5,600	2,800				
3,400	300	1,180	1,980	1,200	2,000				
3,400	400	1,300	2,060	1,340	2,080				
3,400	450	1,380	2,070	1,440	2,100				
3,400	500	1,440	2,080	1,500	2,110				
3,400	600	1,580	2,120	1,640	2,160				
3,400	700	1,720	2,140	1,800	2,180				
3,400	800	1,840	2,150	1,940	2,200				
3,400	900	1,980	2,170	2,080	2,220				
3,400	1,000	2,120	2,240	2,240	2,290				
3,400	1,100	2,260	2,250	2,380	2,310				
3,400	1,200	2,400	2,270	2,520	2,330				
3,400	1,300	2,520	2,280	2,680	2,360				
3,400	1,400	2,660	2,300	2,820	2,380				
3,400	1,500	2,800	2,310	2,960	2,400				
3,400	1,600	2,920	2,330	3,100	2,420				
3,400	1,700	3,080	2,350	3,260	2,440				
3,400	1,800	3,200	2,360	3,400	2,460				
3,400	1,900	3,340	2,380	3,540	2,480				
3,400	2,000	3,480	2,440	3,700	2,550				
3,400	2,100	3,600	2,460	3,840	2,580				
3,400	2,200	3,740	2,470	4,000	2,600				
3,400	2,300	3,880	2,490	4,140	2,620				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,400	2,400	4,000	2,500	4,280	2,640				
3,400	2,500	4,160	2,520	4,440	2,660				
3,400	2,600	4,280	2,540	4,580	2,680				
3,400	2,700	4,420	2,550	4,720	2,700				
3,400	2,800	4,560	2,570	4,860	2,720				
3,400	2,900	4,680	2,600	5,020	2,770				
3,400	3,000	4,820	2,620	5,160	2,790				
3,400	3,100	4,960	2,630	5,300	2,810				
3,400	3,200	5,100	2,650	5,460	2,830				
3,400	3,300	5,240	2,670	5,600	2,850				
3,400	3,400	5,360	2,680	5,740	2,870				
3,500	300	1,180	2,030	1,200	2,050				
3,500	400	1,300	2,120	1,340	2,140				
3,500	450	1,380	2,130	1,440	2,150				
3,500	500	1,440	2,130	1,500	2,160				
3,500	600	1,580	2,180	1,640	2,210				
3,500	700	1,720	2,190	1,800	2,230				
3,500	800	1,840	2,210	1,940	2,250				
3,500	900	1,980	2,230	2,080	2,280				
3,500	1,000	2,120	2,290	2,240	2,350				
3,500	1,100	2,260	2,310	2,380	2,370				
3,500	1,200	2,400	2,320	2,520	2,390				
3,500	1,300	2,520	2,340	2,680	2,410				
3,500	1,400	2,660	2,350	2,820	2,430				
3,500	1,500	2,800	2,370	2,960	2,450				
3,500	1,600	2,920	2,380	3,100	2,470				
3,500	1,700	3,080	2,400	3,260	2,500				
3,500	1,800	3,200	2,420	3,400	2,520				
3,500	1,900	3,340	2,430	3,540	2,540				
3,500	2,000	3,480	2,500	3,700	2,610				
3,500	2,100	3,600	2,510	3,840	2,630				
3,500	2,200	3,740	2,530	4,000	2,650				
3,500	2,300	3,880	2,540	4,140	2,670				
3,500	2,400	4,000	2,560	4,280	2,690				
3,500	2,500	4,160	2,580	4,440	2,720				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,500	2,600	4,280	2,590	4,580	2,740				
3,500	2,700	4,420	2,610	4,720	2,760				
3,500	2,800	4,560	2,620	4,860	2,780				
3,500	2,900	4,680	2,660	5,020	2,820				
3,500	3,000	4,820	2,670	5,160	2,840				
3,500	3,100	4,960	2,690	5,300	2,860				
3,500	3,200	5,100	2,700	5,460	2,880				
3,500	3,300	5,240	2,720	5,600	2,910				
3,500	3,400	5,360	2,740	5,740	2,930				
3,500	3,500	5,500	2,750	5,900	2,950				
3,600	300	1,180	2,090	1,200	2,100				
3,600	400	1,300	2,170	1,340	2,190				
3,600	450	1,380	2,180	1,440	2,200				
3,600	500	1,440	2,180	1,500	2,210				
3,600	600	1,580	2,230	1,640	2,260				
3,600	700	1,720	2,240	1,800	2,280				
3,600	800	1,840	2,260	1,940	2,300				
3,600	900	1,980	2,280	2,080	2,330				
3,600	1,000	2,120	2,340	2,240	2,400				
3,600	1,100	2,260	2,360	2,380	2,420				
3,600	1,200	2,400	2,370	2,520	2,440				
3,600	1,300	2,520	2,390	2,680	2,460				
3,600	1,400	2,660	2,400	2,820	2,480				
3,600	1,500	2,800	2,420	2,960	2,500				
3,600	1,600	2,920	2,430	3,100	2,520				
3,600	1,700	3,080	2,450	3,260	2,550				
3,600	1,800	3,200	2,470	3,400	2,570				
3,600	1,900	3,340	2,480	3,540	2,590				
3,600	2,000	3,480	2,550	3,700	2,660				
3,600	2,100	3,600	2,560	3,840	2,680				
3,600	2,200	3,740	2,580	4,000	2,700				
3,600	2,300	3,880	2,590	4,140	2,720				
3,600	2,400	4,000	2,610	4,280	2,740				
3,600	2,500	4,160	2,630	4,440	2,770				
3,600	2,600	4,280	2,640	4,580	2,790				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,600	2,700	4,420	2,660	4,720	2,810				
3,600	2,800	4,560	2,670	4,860	2,830				
3,600	2,900	4,680	2,710	5,020	2,870				
3,600	3,000	4,820	2,720	5,160	2,890				
3,600	3,100	4,960	2,740	5,300	2,910				
3,600	3,200	5,100	2,750	5,460	2,930				
3,600	3,300	5,240	2,770	5,600	2,960				
3,600	3,400	5,360	2,790	5,740	2,980				
3,600	3,500	5,500	2,800	5,900	3,000				
3,600	3,600	5,640	2,820	6,040	3,020				
3,700	300	1,180	2,140	1,200	2,150				
3,700	400	1,300	2,220	1,340	2,240				
3,700	450	1,380	2,230	1,440	2,260				
3,700	500	1,440	2,240	1,500	2,270				
3,700	600	1,580	2,280	1,640	2,320				
3,700	700	1,720	2,300	1,800	2,340				
3,700	800	1,840	2,310	1,940	2,360				
3,700	900	1,980	2,330	2,080	2,380				
3,700	1,000	2,120	2,400	2,240	2,450				
3,700	1,100	2,260	2,410	2,380	2,470				
3,700	1,200	2,400	2,430	2,520	2,490				
3,700	1,300	2,520	2,440	2,680	2,520				
3,700	1,400	2,660	2,460	2,820	2,540				
3,700	1,500	2,800	2,470	2,960	2,560				
3,700	1,600	2,920	2,490	3,100	2,580				
3,700	1,700	3,080	2,510	3,260	2,600				
3,700	1,800	3,200	2,520	3,400	2,620				
3,700	1,900	3,340	2,540	3,540	2,640				
3,700	2,000	3,480	2,600	3,700	2,710				
3,700	2,100	3,600	2,620	3,840	2,740				
3,700	2,200	3,740	2,630	4,000	2,760				
3,700	2,300	3,880	2,650	4,140	2,780				
3,700	2,400	4,000	2,660	4,280	2,800				
3,700	2,500	4,160	2,680	4,440	2,820				
3,700	2,600	4,280	2,700	4,580	2,840				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,700	2,700	4,420	2,710	4,720	2,860				
3,700	2,800	4,560	2,730	4,860	2,880				
3,700	2,900	4,680	2,760	5,020	2,930				
3,700	3,000	4,820	2,780	5,160	2,950				
3,700	3,100	4,960	2,790	5,300	2,970				
3,700	3,200	5,100	2,810	5,460	2,990				
3,700	3,300	5,240	2,830	5,600	3,010				
3,700	3,400	5,360	2,840	5,740	3,030				
3,700	3,500	5,500	2,860	5,900	3,050				
3,700	3,600	5,640	2,870	6,040	3,070				
3,700	3,700	5,780	2,890	6,200	3,100				
3,800	300	1,180	2,190	1,200	2,210				
3,800	400	1,300	2,270	1,340	2,290				
3,800	450	1,380	2,280	1,440	2,310				
3,800	500	1,440	2,290	1,500	2,320				
3,800	600	1,580	2,330	1,640	2,370				
3,800	700	1,720	2,350	1,800	2,390				
3,800	800	1,840	2,360	1,940	2,410				
3,800	900	1,980	2,380	2,080	2,430				
3,800	1,000	2,120	2,450	2,240	2,500				
3,800	1,100	2,260	2,460	2,380	2,520				
3,800	1,200	2,400	2,480	2,520	2,540				
3,800	1,300	2,520	2,490	2,680	2,570				
3,800	1,400	2,660	2,510	2,820	2,590				
3,800	1,500	2,800	2,520	2,960	2,610				
3,800	1,600	2,920	2,540	3,100	2,630				
3,800	1,700	3,080	2,560	3,260	2,650				
3,800	1,800	3,200	2,570	3,400	2,670				
3,800	1,900	3,340	2,590	3,540	2,690				
3,800	2,000	3,480	2,650	3,700	2,760				
3,800	2,100	3,600	2,670	3,840	2,790				
3,800	2,200	3,740	2,680	4,000	2,810				
3,800	2,300	3,880	2,700	4,140	2,830				
3,800	2,400	4,000	2,710	4,280	2,850				
3,800	2,500	4,160	2,730	4,440	2,870				
3,800	2,600	4,280	2,750	4,580	2,890				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3,800	2,700	4,420	2,760	4,720	2,910				
3,800	2,800	4,560	2,780	4,860	2,930				
4,000	600	1,580	2,440	1,640	2,470				
4,000	700	1,720	2,450	1,800	2,490				
4,000	800	1,840	2,470	1,940	2,510				
4,000	900	1,980	2,490	2,080	2,540				
4,000	1,000	2,120	2,550	2,240	2,610				
4,000	1,100	2,260	2,570	2,380	2,630				
4,000	1,200	2,400	2,580	2,520	2,650				
4,000	1,300	2,520	2,600	2,680	2,670				
4,000	1,400	2,660	2,610	2,820	2,690				
4,000	1,500	2,800	2,630	2,960	2,710				
4,000	1,600	2,920	2,640	3,100	2,730				
4,000	1,700	3,080	2,660	3,260	2,760				
4,000	1,800	3,200	2,680	3,400	2,780				
4,000	1,900	3,340	2,690	3,540	2,800				
4,000	2,000	3,480	2,760	3,700	2,870				
4,000	2,100	3,600	2,770	3,840	2,890				
4,000	2,200	3,740	2,790	4,000	2,910				
4,000	2,300	3,880	2,800	4,140	2,930				
4,000	2,400	4,000	2,820	4,280	2,950				
4,000	2,500	4,160	2,840	4,440	2,980				
4,000	2,600	4,280	2,850	4,580	3,000				
4,000	2,700	4,420	2,870	4,720	3,020				
4,000	2,800	4,560	2,880	4,860	3,040				
4,000	2,900	4,680	2,920	5,020	3,080				
4,000	3,000	4,820	2,930	5,160	3,100				
4,000	3,100	4,960	2,950	5,300	3,120				
4,000	3,200	5,100	2,960	5,460	3,140				
4,000	3,300	5,240	2,980	5,600	3,170				
4,000	3,400	5,360	3,000	5,740	3,190				
4,000	3,500	5,500	3,010	5,900	3,210				
4,000	3,600	5,640	3,030	6,040	3,230				
4,000	3,700	5,780	3,040	6,200	3,250				
4,000	3,800	5,900	3,060	6,340	3,270				

TEE		PN	3	PN	6	PN	10	PN	12
Header	Branch	H	B	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
4,000	3,900	6,040	3,070	6,480	3,290				
4,000	4,000	6,180	3,090	6,620	3,310				

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
80	80	520	260	520	260	520	260
100	80	520	270	520	270	520	270
100	100	540	270	540	270	560	280
150	80	520	290	520	290	520	290
150	100	540	290	540	290	560	300
150	150	600	300	640	320	660	330
200	80	520	320	520	320	520	320
200	100	540	320	540	320	560	330
200	150	600	330	640	340	660	360
200	200	700	350	720	360	760	380
250	100	540	340	540	340	560	350
250	150	600	350	640	370	660	380
250	200	700	370	720	390	760	410
250	250	780	390	820	410	880	440
300	150	600	380	640	400	660	410
300	200	700	400	720	420	760	440
300	250	780	420	820	440	880	470
300	300	880	440	940	470	1,000	500
350	150	740	410	760	420	800	440
350	200	840	430	860	440	900	460
350	250	920	450	960	470	1,020	490
350	300	1,020	470	1,060	490	1,120	520
350	350	1,100	550	1,160	580	1,220	610
400	150	740	430	760	450	800	460
400	200	840	450	860	470	900	490
400	250	920	470	960	490	1,020	520
400	300	1,020	490	1,060	520	1,120	550
400	350	1,100	580	1,160	610	1,220	640
400	400	1,200	600	1,260	630	1,340	670
450	200	840	480	860	490	900	510

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
450	250	920	500	960	520	1,020	540
450	300	1,020	520	1,060	540	1,120	570
450	350	1,100	610	1,160	640	1,220	670
450	400	1,200	630	1,260	660	1,340	700
450	450	1,300	650	1,360	680	1,460	730
500	200	840	500	860	520	900	540
500	250	920	520	960	540	1,020	570
500	300	1,020	540	1,060	570	1,120	600
500	350	1,100	630	1,160	660	1,220	690
500	400	1,200	650	1,260	680	1,340	720
500	450	1,300	670	1,360	710	1,460	750
500	500	1,380	690	1,460	730	1,560	780
600	250	980	580	1,020	600	1,080	620
600	300	1,080	600	1,120	620	1,180	650
600	400	1,260	700	1,320	730	1,400	770
600	450	1,360	720	1,420	760	1,520	800
600	500	1,440	740	1,520	780	1,620	830
600	600	1,620	810	1,720	860	1,840	920
700	300	1,080	650	1,120	670	1,180	700
700	400	1,260	760	1,320	790	1,400	830
700	450	1,360	780	1,420	810	1,520	860
700	500	1,440	800	1,520	840	1,620	880
700	600	1,620	870	1,720	910	1,840	970
700	700	1,820	910	1,920	960	2,060	1,030
800	300	1,080	700	1,120	730	1,180	760
800	400	1,260	810	1,320	840	1,400	880
800	450	1,360	830	1,420	860	1,520	910
800	500	1,440	850	1,520	890	1,620	930
800	600	1,620	920	1,720	960	1,840	1,020
800	700	1,820	960	1,920	1,010	2,060	1,080
800	800	2,000	1,000	2,120	1,060	2,260	1,130
900	300	1,080	750	1,120	780	1,180	810
900	400	1,260	860	1,320	890	1,400	930
900	450	1,360	880	1,420	910	1,520	960
900	500	1,440	900	1,520	940	1,620	980

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
900	600	1,620	970	1,720	1,010	1,840	1,070
900	700	1,820	1,010	1,920	1,060	2,060	1,130
900	800	2,000	1,050	2,120	1,110	2,260	1,180
900	900	2,180	1,090	2,320	1,160	2,480	1,240
1,000	300	1,180	800	1,220	830	1,280	860
1,000	400	1,360	910	1,420	940	1,500	980
1,000	450	1,460	930	1,520	970	1,620	1,010
1,000	500	1,540	950	1,620	990	1,720	1,040
1,000	600	1,720	1,020	1,820	1,070	1,940	1,130
1,000	700	1,920	1,060	2,020	1,120	2,160	1,180
1,000	800	2,100	1,100	2,220	1,160	2,360	1,240
1,000	900	2,280	1,140	2,420	1,210	2,580	1,300
1,000	1,000	2,460	1,230	2,620	1,310	2,800	1,400
1,100	300	1,180	860	1,220	880	1,280	910
1,100	400	1,360	960	1,420	990	1,500	1,030
1,100	450	1,460	980	1,520	1,020	1,620	1,060
1,100	500	1,540	1,000	1,620	1,040	1,720	1,090
1,100	600	1,720	1,070	1,820	1,120	1,940	1,180
1,100	700	1,920	1,110	2,020	1,170	2,160	1,230
1,100	800	2,100	1,150	2,220	1,210	2,360	1,290
1,100	900	2,280	1,190	2,420	1,260	2,580	1,350
1,100	1,000	2,460	1,280	2,620	1,360	2,800	1,450
1,100	1,100	2,640	1,320	2,820	1,410	3,020	1,510
1,200	300	1,180	910	1,220	930	1,280	960
1,200	400	1,360	1,020	1,420	1,050	1,500	1,090
1,200	450	1,460	1,040	1,520	1,070	1,620	1,120
1,200	500	1,540	1,060	1,620	1,100	1,720	1,140
1,200	600	1,720	1,130	1,820	1,170	1,940	1,230
1,200	700	1,920	1,170	2,020	1,220	2,160	1,290
1,200	800	2,100	1,210	2,220	1,270	2,360	1,340
1,200	900	2,280	1,250	2,420	1,320	2,580	1,400
1,200	1,000	2,460	1,340	2,620	1,410	2,800	1,510
1,200	1,100	2,640	1,380	2,820	1,460	3,020	1,570
1,200	1,200	2,840	1,420	3,020	1,510	3,240	1,620
1,300	300	1,180	960	1,220	990	1,280	1,020

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
1,300	400	1,360	1,070	1,420	1,100	1,500	1,140
1,300	450	1,460	1,090	1,520	1,120	1,620	1,170
1,300	500	1,540	1,110	1,620	1,150	1,720	1,190
1,300	600	1,720	1,180	1,820	1,220	1,940	1,280
1,300	700	1,920	1,220	2,020	1,270	2,160	1,340
1,300	800	2,100	1,260	2,220	1,320	2,360	1,390
1,300	900	2,280	1,300	2,420	1,370	2,580	1,450
1,300	1,000	2,460	1,390	2,620	1,460	2,800	1,560
1,300	1,100	2,640	1,430	2,820	1,510	3,020	1,620
1,300	1,200	2,840	1,470	3,020	1,560	3,240	1,670
1,300	1,300	3,020	1,510	3,220	1,610	3,460	1,730
1,400	300	1,180	1,010	1,220	1,040	1,280	1,070
1,400	400	1,360	1,120	1,420	1,150	1,500	1,190
1,400	450	1,460	1,140	1,520	1,170	1,620	1,220
1,400	500	1,540	1,160	1,620	1,200	1,720	1,240
1,400	600	1,720	1,230	1,820	1,270	1,940	1,330
1,400	700	1,920	1,270	2,020	1,320	2,160	1,390
1,400	800	2,100	1,310	2,220	1,370	2,360	1,440
1,400	900	2,280	1,350	2,420	1,420	2,580	1,500
1,400	1,000	2,460	1,440	2,620	1,510	2,800	1,610
1,400	1,100	2,640	1,480	2,820	1,560	3,020	1,670
1,400	1,200	2,840	1,520	3,020	1,610	3,240	1,720
1,400	1,300	3,020	1,560	3,220	1,660	3,460	1,780
1,400	1,400	3,200	1,600	3,400	1,700	3,680	1,840
1,500	300	1,180	1,060				
1,500	400	1,360	1,170				
1,500	450	1,460	1,190				
1,500	500	1,540	1,210				
1,500	600	1,720	1,280				
1,500	700	1,920	1,320				
1,500	800	2,100	1,360				
1,500	900	2,280	1,400				
1,500	1,000	2,460	1,490				
1,500	1,100	2,640	1,530				
1,500	1,200	2,840	1,570				

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
1,500	1,300	3,020	1,610				
1,500	1,400	3,200	1,650				
1,500	1,500	3,380	1,690				
1,600	300	1,180	1,120				
1,600	400	1,360	1,220				
1,600	450	1,460	1,240				
1,600	500	1,540	1,260				
1,600	600	1,720	1,330				
1,600	700	1,920	1,370				
1,600	800	2,100	1,410				
1,600	900	2,280	1,450				
1,600	1,000	2,460	1,540				
1,600	1,100	2,640	1,580				
1,600	1,200	2,840	1,620				
1,600	1,300	3,020	1,660				
1,600	1,400	3,200	1,700				
1,600	1,500	3,380	1,740				
1,600	1,600	3,560	1,780				
1,700	300	1,180	1,170				
1,700	400	1,360	1,280				
1,700	450	1,460	1,300				
1,700	500	1,540	1,320				
1,700	600	1,720	1,390				
1,700	700	1,920	1,430				
1,700	800	2,100	1,470				
1,700	900	2,280	1,510				
1,700	1,000	2,460	1,600				
1,700	1,100	2,640	1,640				
1,700	1,200	2,840	1,680				
1,700	1,300	3,020	1,720				
1,700	1,400	3,200	1,760				
1,700	1,500	3,380	1,800				
1,700	1,600	3,560	1,840				
1,700	1,700	3,760	1,880				
1,800	300	1,180	1,220				

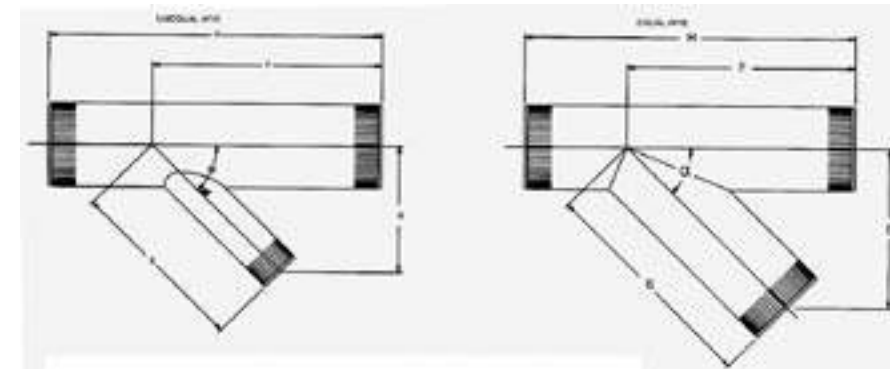
TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
1,800	400	1,360	1,330				
1,800	450	1,460	1,350				
1,800	500	1,540	1,370				
1,800	600	1,720	1,440				
1,800	700	1,920	1,480				
1,800	800	2,100	1,520				
1,800	900	2,280	1,560				
1,800	1,000	2,460	1,650				
1,800	1,100	2,640	1,690				
1,800	1,200	2,840	1,730				
1,800	1,300	3,020	1,770				
1,800	1,400	3,200	1,810				
1,800	1,500	3,380	1,850				
1,800	1,600	3,560	1,890				
1,800	1,700	3,760	1,930				
1,800	1,800	3,940	1,970				
1,900	300	1,180	1,270				
1,900	400	1,360	1,380				
1,900	450	1,460	1,400				
1,900	500	1,540	1,420				
1,900	600	1,720	1,490				
1,900	700	1,920	1,530				
1,900	800	2,100	1,570				
1,900	900	2,280	1,610				
1,900	1,000	2,460	1,700				
1,900	1,100	2,640	1,740				
1,900	1,200	2,840	1,780				
1,900	1,300	3,020	1,820				
1,900	1,400	3,200	1,860				
1,900	1,500	3,380	1,900				
1,900	1,600	3,560	1,940				
1,900	1,700	3,760	1,980				
1,900	1,800	3,940	2,020				
1,900	1,900	4,120	2,060				
2,000	300	1,280	1,320				

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
2,000	400	1,460	1,430				
2,000	450	1,560	1,450				
2,000	500	1,640	1,470				
2,000	600	1,820	1,540				
2,000	700	2,020	1,580				
2,000	800	2,200	1,620				
2,000	900	2,380	1,660				
2,000	1,000	2,560	1,750				
2,000	1,100	2,740	1,790				
2,000	1,200	2,940	1,830				
2,000	1,300	3,120	1,870				
2,000	1,400	3,300	1,910				
2,000	1,500	3,480	1,950				
2,000	1,600	3,660	1,990				
2,000	1,700	3,860	2,030				
2,000	1,800	4,040	2,070				
2,000	1,900	4,220	2,110				
2,000	2,000	4,400	2,200				
2,100	300	1,280	1,380				
2,100	400	1,460	1,480				
2,100	450	1,560	1,500				
2,100	500	1,640	1,520				
2,100	600	1,820	1,590				
2,100	700	2,020	1,630				
2,100	800	2,200	1,670				
2,100	900	2,380	1,710				
2,100	1,000	2,560	1,800				
2,100	1,100	2,740	1,840				
2,100	1,200	2,940	1,880				
2,100	1,300	3,120	1,920				
2,100	1,400	3,300	1,960				
2,100	1,500	3,480	2,000				
2,100	1,600	3,660	2,040				
2,100	1,700	3,860	2,080				
2,100	1,800	4,040	2,120				

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
2,100	1,900	4,220	2,160				
2,100	2,000	4,400	2,250				
2,100	2,100	4,580	2,290				
2,200	300	1,280	1,430				
2,200	400	1,460	1,540				
2,200	450	1,560	1,560				
2,200	500	1,640	1,580				
2,200	600	1,820	1,650				
2,200	700	2,020	1,690				
2,200	800	2,200	1,730				
2,200	900	2,380	1,770				
2,200	1,000	2,560	1,860				
2,200	1,100	2,740	1,900				
2,200	1,200	2,940	1,940				
2,200	1,300	3,120	1,980				
2,200	1,400	3,300	2,020				
2,200	1,500	3,480	2,060				
2,200	1,600	3,660	2,100				
2,200	1,700	3,860	2,140				
2,200	1,800	4,040	2,180				
2,200	1,900	4,220	2,220				
2,200	2,000	4,400	2,310				
2,200	2,100	4,580	2,350				
2,200	2,200	4,780	2,390				
2,300	300	1,280	1,480				
2,300	400	1,460	1,590				
2,300	450	1,560	1,610				
2,300	500	1,640	1,630				
2,300	600	1,820	1,700				
2,300	700	2,020	1,740				
2,300	800	2,200	1,780				
2,300	900	2,380	1,820				
2,300	1,000	2,560	1,910				
2,300	1,100	2,740	1,950				
2,300	1,200	2,940	1,990				

TEE		PN	16	PN	20	PN	25
Header	Branch	H	B	H	B	H	B
DN mm	DN mm	mm	mm	mm	mm	mm	mm
2,300	1,300	3,120	2,030				
2,300	1,400	3,300	2,070				
2,300	1,500	3,480	2,110				
2,300	1,600	3,660	2,150				
2,300	1,700	3,860	2,190				
2,300	1,800	4,040	2,230				
2,300	1,900	4,220	2,270				
2,300	2,000	4,400	2,360				
2,300	2,100	4,580	2,400				
2,300	2,200	4,780	2,440				
2,300	2,300	4,960	2,480				
2,400	300	1,280	1,530				
2,400	400	1,460	1,640				
2,400	450	1,560	1,660				
2,400	500	1,640	1,680				
2,400	600	1,820	1,750				
2,400	700	2,020	1,790				
2,400	800	2,200	1,830				
2,400	900	2,380	1,870				
2,400	1,000	2,560	1,960				
2,400	1,100	2,740	2,000				
2,400	1,200	2,940	2,040				
2,400	1,300	3,120	2,080				
2,400	1,400	3,300	2,120				
2,400	1,500	3,480	2,160				
2,400	1,600	3,660	2,200				
2,400	1,700	3,860	2,240				
2,400	1,800	4,040	2,280				
2,400	1,900	4,220	2,320				
2,400	2,000	4,400	2,410				
2,400	2,100	4,580	2,450				
2,400	2,200	4,780	2,490				
2,400	2,300	4,960	2,530				
2,400	2,400	5,140	2,570				

D. WYES



WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
80	80	800	419	300	419	750	439	400	389
100	80	800	433	325	429	750	451	400	395
100	100	800	444	325	444	800	469	425	407
150	80	800	469	350	454	750	480	425	410
150	100	800	479	350	469	800	498	450	422
150	150	900	504	375	504	850	541	475	451
200	80	800	505	375	479	750	509	450	425
200	100	800	515	375	494	800	527	475	436
200	150	900	540	400	529	850	570	500	465
200	200	950	565	400	565	900	614	550	495
250	80	800	541	400	505	750	539	475	439
250	100	800	551	400	520	800	557	500	451
250	150	900	576	425	555	850	600	525	480
250	200	950	602	450	591	900	644	575	509
250	250	1000	628	450	628	950	689	600	539
300	100	800	600	425	554	800	596	525	471
300	150	900	625	450	589	850	639	575	500

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
300	200	950	650	475	625	900	683	600	529
300	250	1000	676	500	662	950	728	650	559
300	300	1100	710	525	710	1050	787	700	598
350	100	800	624	450	571	800	616	550	481
350	150	900	649	475	607	850	660	575	510
350	200	950	675	500	643	900	704	625	539
350	250	1000	701	500	679	950	748	650	569
350	300	1100	735	525	727	1050	807	700	608
350	350	1200	772	550	772	1050	838	750	629
400	100	800	660	475	597	800	646	575	496
400	150	900	685	500	632	850	689	600	525
400	200	950	711	525	668	900	733	650	554
400	250	1000	737	525	705	950	778	675	584
400	300	1150	791	575	773	1050	837	725	623
400	350	1200	808	575	798	1050	867	775	643
400	400	1300	854	625	854	1150	931	825	693
450	100	800	696	500	622	800	675	600	510
450	150	900	721	525	658	850	718	625	539
450	200	950	747	550	694	900	762	675	569
450	250	1050	793	575	750	950	807	700	598
450	300	1150	827	600	798	1050	866	775	638
450	350	1200	844	600	823	1100	916	800	678
450	400	1300	890	650	879	1150	961	850	707
450	450	1400	915	650	915	1250	1005	875	737
500	100	800	732	525	648	800	705	625	525
500	150	900	757	550	683	850	748	650	554
500	200	950	783	575	719	900	792	700	583
500	250	1000	809	575	756	950	837	725	613
500	300	1150	863	625	824	1050	896	800	652
500	350	1250	900	650	869	1100	946	825	693
500	400	1300	926	675	905	1150	990	875	722
500	450	1450	971	700	961	1250	1054	925	772
500	500	1500	997	725	997	1350	1098	975	801
600	300	1150	935	675	875	1050	954	850	682
600	400	1350	1018	725	976	1250	1069	950	772

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
600	450	1450	1043	750	1012	1300	1113	975	801
600	500	1550	1089	775	1068	1350	1157	1025	830
600	600	1750	1167	850	1167	1500	1273	1125	916
700	300	1150	1007	725	926	1100	1033	900	731
700	400	1350	1090	775	1027	1250	1128	1000	801
700	450	1500	1136	825	1083	1300	1192	1050	850
700	500	1550	1161	825	1119	1400	1236	1075	880
700	600	1750	1239	900	1218	1550	1352	1175	966
700	700	1950	1310	950	1310	1650	1440	1250	1025
800	300	1200	1099	800	997	1100	1092	950	761
800	400	1350	1162	825	1078	1250	1187	1050	830
800	450	1550	1228	875	1154	1300	1251	1100	880
800	500	1600	1253	900	1190	1400	1315	1150	929
800	600	1800	1331	950	1289	1550	1410	1225	995
800	700	1950	1402	1000	1381	1700	1519	1325	1074
800	800	2150	1473	1050	1473	1850	1627	1425	1153
900	300	1200	1171	850	1048	1100	1151	1000	790
900	400	1350	1234	875	1129	1250	1246	1100	860
900	450	1500	1280	925	1185	1300	1310	1150	909
900	500	1650	1345	975	1261	1400	1374	1200	959
900	600	1800	1423	1025	1360	1600	1489	1300	1045
900	700	1950	1474	1050	1432	1750	1598	1400	1124
900	800	2150	1545	1100	1524	1850	1686	1475	1183
900	900	2350	1616	1150	1616	2000	1794	1575	1261
1000	300	1250	1263	900	1119	1150	1230	1075	840
1000	400	1400	1326	950	1200	1250	1305	1150	889
1000	450	1500	1352	975	1236	1300	1369	1200	939
1000	500	1600	1397	1000	1292	1400	1413	1225	968
1000	600	1800	1495	1075	1411	1600	1548	1350	1074
1000	700	2000	1566	1125	1503	1750	1657	1450	1153
1000	800	2200	1637	1175	1595	1900	1765	1550	1232
1000	900	2350	1708	1225	1687	2050	1873	1625	1311
1000	1000	2550	1779	1275	1779	2150	1962	1700	1370
1100	300	1250	1336	950	1170	1150	1289	1125	869
1100	400	1400	1399	1000	1251	1250	1383	1200	939

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1100	450	1550	1444	1025	1307	1300	1428	1250	968
1100	500	1600	1470	1050	1343	1400	1492	1300	1018
1100	600	1850	1588	1125	1482	1600	1627	1425	1124
1100	700	2050	1659	1175	1574	1800	1735	1525	1203
1100	800	2250	1730	1225	1666	1900	1824	1600	1261
1100	900	2350	1781	1275	1738	2050	1932	1675	1340
1100	1000	2550	1852	1325	1830	2200	2040	1775	1419
1100	1100	2750	1923	1375	1923	2350	2149	1875	1498
1200	300	1250	1408	1000	1221	1150	1348	1175	899
1200	400	1450	1491	1075	1322	1250	1442	1250	968
1200	450	1550	1516	1075	1358	1350	1506	1325	1018
1200	500	1650	1562	1125	1414	1400	1551	1350	1047
1200	600	1800	1640	1175	1513	1600	1666	1450	1133
1200	700	2050	1731	1225	1625	1800	1794	1575	1232
1200	800	2250	1802	1275	1717	1950	1903	1650	1311
1200	900	2400	1873	1325	1809	2100	2011	1750	1390
1200	1000	2600	1944	1375	1901	2200	2099	1825	1449
1200	1100	2800	2015	1425	1994	2350	2208	1925	1528
1200	1200	2950	2086	1475	2086	2550	2316	2025	1606
1300	300	1300	1500	1075	1292	1150	1407	1225	928
1300	400	1450	1563	1125	1373	1250	1501	1325	998
1300	450	1550	1588	1125	1409	1350	1565	1375	1047
1300	500	1650	1634	1175	1465	1400	1610	1400	1077
1300	600	1800	1712	1225	1564	1600	1725	1500	1162
1300	700	2100	1823	1300	1696	1800	1873	1625	1281
1300	800	2250	1894	1350	1788	2000	1982	1725	1360
1300	900	2450	1965	1400	1880	2100	2070	1800	1419
1300	1000	2650	2036	1450	1972	2250	2178	1900	1498
1300	1100	2800	2107	1500	2065	2400	2287	2000	1577
1300	1200	2950	2158	1550	2137	2550	2375	2075	1636
1300	1300	3150	2229	1600	2229	2700	2483	2175	1715
1400	300	1300	1572	1125	1343	1150	1486	1300	977
1400	400	1450	1635	1175	1424	1300	1580	1375	1047
1400	450	1550	1680	1200	1480	1350	1624	1425	1077
1400	500	1650	1706	1225	1516	1450	1688	1475	1126

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1400	600	1800	1784	1275	1615	1600	1804	1575	1212
1400	700	2000	1855	1325	1707	1750	1892	1650	1271
1400	800	2250	1966	1400	1839	2000	2040	1775	1390
1400	900	2450	2037	1450	1931	2150	2149	1875	1469
1400	1000	2650	2108	1500	2023	2300	2257	1975	1548
1400	1100	2800	2179	1550	2116	2400	2345	2050	1606
1400	1200	3000	2250	1600	2208	2550	2454	2150	1685
1400	1300	3200	2321	1650	2300	2750	2562	2225	1764
1400	1400	3400	2392	1700	2392	2850	2650	2300	1823
1500	300	1300	1644	1175	1394	1150	1545	1350	1007
1500	400	1500	1727	1225	1495	1300	1639	1425	1077
1500	450	1550	1753	1250	1531	1400	1703	1475	1126
1500	500	1700	1798	1275	1587	1450	1747	1525	1155
1500	600	1850	1876	1350	1686	1600	1863	1625	1241
1500	700	2050	1947	1400	1778	1800	1971	1725	1320
1500	800	2300	2058	1475	1910	2000	2099	1825	1419
1500	900	2500	2129	1525	2002	2150	2208	1925	1498
1500	1000	2700	2200	1575	2094	2300	2316	2025	1577
1500	1100	2850	2271	1625	2187	2450	2424	2100	1656
1500	1200	3050	2342	1675	2279	2600	2533	2200	1735
1500	1300	3250	2413	1725	2371	2750	2621	2275	1794
1500	1400	3400	2464	1750	2443	2900	2729	2375	1873
1500	1500	3550	2535	1800	2535	3050	2838	2475	1951
1600	300	1350	1736	1250	1465	1150	1603	1400	1036
1600	400	1500	1799	1275	1546	1300	1698	1475	1106
1600	450	1600	1845	1325	1602	1400	1762	1550	1155
1600	500	1700	1870	1325	1638	1450	1806	1575	1185
1600	600	1850	1948	1400	1737	1600	1922	1675	1271
1600	700	2050	2019	1450	1829	1800	2030	1775	1350
1600	800	2250	2090	1500	1921	1950	2138	1875	1429
1600	900	2550	2221	1575	2073	2150	2287	2000	1548
1600	1000	2700	2292	1625	2165	2350	2395	2075	1626
1600	1100	2850	2343	1675	2238	2450	2483	2175	1685
1600	1200	3050	2414	1725	2330	2600	2592	2250	1764
1600	1300	3250	2485	1775	2422	2750	2700	2350	1843

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1600	1400	3400	2556	1825	2514	2900	2808	2450	1922
1600	1500	3600	2627	1875	2606	3050	2897	2525	1981
1600	1600	3800	2698	1925	2698	3200	3005	2625	2060
1700	300	1350	1808	1300	1516	1150	1662	1450	1066
1700	400	1500	1871	1325	1597	1350	1777	1550	1155
1700	450	1600	1917	1375	1653	1400	1821	1600	1185
1700	500	1700	1962	1400	1709	1500	1885	1650	1234
1700	600	1900	2040	1450	1808	1650	2000	1750	1320
1700	700	2100	2111	1500	1900	1800	2109	1850	1399
1700	800	2250	2182	1550	1992	1950	2197	1925	1458
1700	900	2550	2293	1625	2124	2150	2345	2050	1577
1700	1000	2700	2364	1675	2216	2350	2454	2150	1656
1700	1100	2900	2435	1725	2309	2500	2562	2225	1735
1700	1200	3100	2506	1775	2401	2650	2670	2325	1814
1700	1300	3250	2577	1825	2493	2750	2759	2400	1873
1700	1400	3450	2648	1875	2585	2900	2867	2500	1951
1700	1500	3650	2719	1925	2677	3100	2975	2600	2030
1700	1600	3800	2770	1975	2749	3250	3084	2675	2109
1700	1700	3950	2841	2025	2841	3350	3172	2750	2168
1800	300	1350	1881	1350	1567	1200	1741	1525	1115
1800	400	1550	1964	1400	1668	1350	1836	1600	1185
1800	450	1600	1989	1425	1704	1400	1880	1650	1214
1800	500	1700	2035	1450	1760	1500	1944	1700	1264
1800	600	1900	2113	1500	1859	1650	2059	1800	1350
1800	700	2100	2184	1550	1951	1800	2168	1900	1429
1800	800	2250	2255	1600	2043	2000	2276	1975	1508
1800	900	2450	2326	1650	2135	2150	2384	2075	1586
1800	1000	2750	2457	1750	2287	2350	2533	2200	1705
1800	1100	2950	2528	1800	2380	2500	2621	2275	1764
1800	1200	3150	2599	1850	2472	2650	2729	2375	1843
1800	1300	3300	2670	1900	2564	2800	2838	2475	1922
1800	1400	3450	2721	1925	2636	2950	2946	2575	2001
1800	1500	3650	2792	1975	2728	3100	3034	2650	2060
1800	1600	3800	2863	2025	2820	3250	3143	2725	2139
1800	1700	4000	2934	2075	2912	3400	3251	2825	2218

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
1800	1800	4200	3005	2125	3005	3500	3339	2900	2276
1900	300	1350	1953	1400	1618	1200	1800	1575	1145
1900	400	1550	2036	1450	1719	1350	1895	1650	1214
1900	450	1650	2081	1475	1775	1450	1959	1700	1264
1900	500	1700	2107	1500	1811	1500	2003	1750	1293
1900	600	1900	2185	1550	1910	1650	2118	1850	1379
1900	700	2150	2276	1625	2022	1800	2227	1950	1458
1900	800	2300	2347	1675	2114	2000	2335	2025	1537
1900	900	2500	2418	1725	2206	2150	2443	2125	1616
1900	1000	2750	2529	1800	2338	2350	2592	2250	1735
1900	1100	2950	2600	1850	2431	2550	2700	2350	1814
1900	1200	3150	2671	1900	2523	2700	2808	2450	1893
1900	1300	3300	2742	1950	2615	2850	2917	2550	1971
1900	1400	3500	2813	2000	2707	2950	3005	2625	2030
1900	1500	3700	2884	2050	2799	3100	3113	2700	2109
1900	1600	3850	2955	2100	2891	3300	3222	2800	2188
1900	1700	4050	3026	2150	2983	3400	3310	2875	2247
1900	1800	4200	3077	2200	3056	3550	3418	2975	2326
1900	1900	4400	3148	2250	3148	3700	3527	3075	2405
2000	300	1350	2045	1450	1689	1200	1859	1625	1174
2000	400	1550	2108	1500	1770	1350	1953	1700	1244
2000	450	1650	2153	1525	1826	1450	2018	1750	1293
2000	500	1750	2199	1575	1882	1550	2082	1825	1343
2000	600	1950	2277	1625	1981	1700	2197	1925	1429
2000	700	2150	2348	1675	2073	1850	2305	2000	1508
2000	800	2300	2419	1725	2165	2000	2394	2075	1566
2000	900	2500	2490	1775	2257	2150	2502	2175	1645
2000	1000	2700	2561	1825	2349	2300	2610	2275	1724
2000	1100	3000	2692	1925	2502	2550	2759	2400	1843
2000	1200	3150	2763	1975	2594	2700	2867	2500	1922
2000	1300	3350	2834	2025	2686	2850	2975	2600	2001
2000	1400	3550	2905	2075	2778	3000	3084	2675	2080
2000	1500	3700	2976	2125	2870	3150	3192	2775	2159
2000	1600	3850	3027	2150	2942	3300	3281	2850	2218
2000	1700	4050	3098	2200	3034	3450	3389	2950	2296

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2000	1800	4250	3169	2250	3127	3600	3497	3050	2375
2000	1900	4400	3240	2300	3219	3700	3586	3125	2434
2000	2000	4600	3311	2350	3311	3850	3694	3200	2513
2100	300	1350	2117	1500	1740	1200	1918	1675	1204
2100	400	1550	2180	1550	1821	1400	2032	1775	1293
2100	450	1650	2225	1575	1877	1450	2077	1800	1323
2100	500	1750	2271	1625	1933	1550	2141	1875	1372
2100	600	1950	2349	1675	2032	1700	2256	1975	1458
2100	700	2150	2420	1725	2124	1850	2364	2050	1537
2100	800	2300	2491	1775	2216	2000	2473	2150	1616
2100	900	2500	2562	1825	2308	2150	2581	2250	1695
2100	1000	2700	2633	1875	2400	2350	2689	2350	1774
2100	1100	3000	2764	1975	2553	2550	2838	2475	1893
2100	1200	3150	2835	2025	2645	2750	2946	2575	1971
2100	1300	3350	2906	2075	2737	2900	3054	2650	2050
2100	1400	3550	2977	2125	2829	3000	3143	2725	2109
2100	1500	3700	3048	2175	2921	3150	3251	2825	2188
2100	1600	3900	3119	2225	3013	3300	3359	2925	2267
2100	1700	4100	3190	2275	3105	3500	3468	3025	2346
2100	1800	4250	3261	2325	3198	3600	3556	3100	2405
2100	1900	4450	3332	2375	3290	3750	3664	3175	2484
2100	2000	4600	3383	2400	3362	3900	3773	3275	2563
2100	2100	4800	3454	2450	3454	4050	3861	3350	2622
2200	300	1350	2189	1550	1791	1250	1997	1750	1253
2200	400	1550	2272	1625	1892	1400	2091	1825	1323
2200	450	1650	2298	1625	1928	1450	2135	1850	1352
2200	500	1750	2343	1675	1984	1550	2200	1925	1402
2200	600	1950	2421	1725	2083	1700	2315	2025	1487
2200	700	2150	2512	1800	2195	1850	2423	2100	1566
2200	800	2350	2583	1850	2287	2000	2532	2200	1645
2200	900	2550	2654	1900	2379	2150	2640	2300	1724
2200	1000	2700	2725	1950	2471	2350	2748	2400	1803
2200	1100	2900	2796	2000	2564	2500	2857	2475	1882
2200	1200	3200	2927	2075	2716	2750	3005	2625	2001
2200	1300	3400	2998	2125	2808	2900	3113	2700	2080

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2200	1400	3600	3069	2175	2900	3050	3222	2800	2159
2200	1500	3750	3140	2225	2992	3200	3330	2900	2238
2200	1600	3950	3211	2275	3084	3300	3418	2975	2296
2200	1700	4150	3282	2325	3176	3500	3527	3075	2375
2200	1800	4250	3333	2375	3249	3650	3635	3150	2454
2200	1900	4450	3404	2425	3341	3800	3743	3250	2533
2200	2000	4650	3475	2475	3433	3900	3832	3325	2592
2200	2100	4850	3546	2525	3525	4050	3940	3425	2671
2200	2200	5000	3617	2575	3617	4250	4048	3525	2750
2300	300	1400	2281	1625	1862	1250	2056	1800	1282
2300	400	1550	2344	1675	1943	1400	2150	1875	1352
2300	450	1700	2390	1700	1999	1500	2214	1925	1402
2300	500	1750	2415	1725	2035	1550	2259	1975	1431
2300	600	2000	2513	1800	2154	1700	2374	2075	1517
2300	700	2150	2584	1850	2246	1900	2502	2175	1616
2300	800	2350	2655	1900	2338	2000	2591	2250	1675
2300	900	2550	2726	1950	2430	2150	2699	2350	1754
2300	1000	2700	2797	2000	2522	2350	2807	2450	1833
2300	1100	2900	2868	2050	2615	2500	2916	2525	1911
2300	1200	3250	3019	2150	2787	2750	3084	2675	2050
2300	1300	3450	3090	2200	2879	2950	3192	2775	2129
2300	1400	3600	3161	2250	2971	3050	3281	2850	2188
2300	1500	3750	3212	2275	3043	3200	3389	2950	2267
2300	1600	3950	3283	2325	3135	3350	3497	3050	2346
2300	1700	4150	3354	2375	3227	3500	3606	3125	2425
2300	1800	4300	3425	2425	3320	3650	3694	3200	2484
2300	1900	4500	3496	2475	3412	3800	3802	3300	2563
2300	2000	4700	3567	2525	3504	3950	3911	3400	2641
2300	2100	4850	3638	2575	3596	4100	4019	3500	2720
2300	2200	5000	3689	2625	3668	4250	4107	3575	2779
2300	2300	5200	3760	2675	3760	4400	4216	3675	2858
2400	300	1400	2353	1675	1913	1300	2135	1850	1332
2400	400	1550	2416	1725	1994	1400	2209	1925	1382
2400	450	1700	2462	1750	2050	1500	2273	1975	1431
2400	500	1800	2507	1775	2106	1600	2337	2025	1480

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2400	600	2000	2585	1850	2205	1750	2453	2125	1566
2400	700	2150	2656	1900	2297	1900	2561	2225	1645
2400	800	2400	2747	1950	2409	2050	2669	2325	1724
2400	900	2550	2818	2000	2501	2200	2778	2425	1803
2400	1000	2750	2889	2050	2593	2350	2886	2500	1882
2400	1100	2950	2960	2100	2686	2500	2974	2600	1941
2400	1200	3150	3031	2150	2778	2650	3083	2675	2020
2400	1300	3450	3162	2250	2930	2950	3251	2825	2159
2400	1400	3600	3233	2300	3022	3100	3359	2925	2238
2400	1500	3800	3304	2350	3114	3250	3468	3025	2316
2400	1600	4000	3375	2400	3206	3350	3556	3100	2375
2400	1700	4150	3446	2450	3298	3500	3664	3175	2454
2400	1800	4350	3517	2500	3391	3700	3773	3275	2533
2400	1900	4550	3588	2550	3483	3850	3881	3375	2612
2400	2000	4700	3659	2600	3575	3950	3969	3450	2671
2400	2100	4850	3710	2625	3647	4100	4078	3550	2750
2400	2200	5050	3781	2675	3739	4250	4186	3650	2829
2400	2300	5250	3852	2725	3831	4400	4274	3725	2888
2400	2400	5400	3923	2775	3923	4550	4383	3800	2967
2500	300	1450	2446	1750	1984	1300	2193	1900	1361
2500	400	1600	2509	1775	2065	1450	2288	2000	1431
2500	450	1700	2534	1800	2101	1500	2332	2025	1460
2500	500	1800	2580	1825	2157	1600	2396	2100	1510
2500	600	2000	2658	1900	2256	1750	2512	2200	1596
2500	700	2200	2749	1950	2368	1900	2620	2275	1675
2500	800	2400	2820	2000	2460	2050	2728	2375	1754
2500	900	2550	2891	2050	2552	2200	2837	2475	1833
2500	1000	2750	2962	2100	2644	2350	2945	2575	1911
2500	1100	2950	3033	2150	2737	2550	3053	2650	1990
2500	1200	3150	3104	2200	2829	2700	3162	2750	2069
2500	1300	3450	3255	2325	3001	2950	3310	2875	2188
2500	1400	3650	3326	2375	3093	3100	3418	2975	2267
2500	1500	3850	3397	2425	3185	3250	3527	3075	2346
2500	1600	4000	3468	2475	3277	3400	3635	3150	2425
2500	1700	4200	3539	2525	3369	3550	3743	3250	2504

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2500	1800	4350	3590	2550	3442	3700	3852	3350	2583
2500	1900	4550	3661	2600	3534	3850	3940	3425	2641
2500	2000	4700	3732	2650	3626	4000	4048	3525	2720
2500	2100	4900	3803	2700	3718	4150	4157	3600	2799
2500	2200	5100	3874	2750	3810	4250	4245	3700	2858
2500	2300	5250	3945	2800	3902	4400	4353	3775	2937
2500	2400	5400	3996	2850	3974	4600	4462	3875	3016
2500	2500	5600	4067	2900	4067	4700	4550	3950	3075
2600	300	1450	2518	1800	2035	1350	2272	1975	1411
2600	400	1600	2581	1825	2116	1450	2347	2050	1460
2600	450	1750	2626	1875	2172	1500	2391	2075	1490
2600	500	1800	2652	1900	2208	1600	2455	2150	1539
2600	600	2000	2750	1950	2327	1750	2571	2250	1625
2600	700	2200	2821	2000	2419	1900	2679	2325	1704
2600	800	2400	2892	2050	2511	2050	2787	2425	1783
2600	900	2550	2963	2100	2603	2200	2896	2525	1862
2600	1000	2800	3054	2175	2715	2350	3004	2625	1941
2600	1100	3000	3125	2225	2808	2550	3112	2700	2020
2600	1200	3150	3196	2275	2900	2700	3221	2800	2099
2600	1300	3300	3247	2300	2972	2850	3329	2900	2178
2600	1400	3650	3398	2425	3144	3100	3497	3050	2316
2600	1500	3850	3469	2475	3236	3300	3606	3125	2395
2600	1600	4000	3540	2525	3328	3450	3714	3225	2474
2600	1700	4200	3611	2575	3420	3550	3802	3300	2533
2600	1800	4400	3682	2625	3513	3700	3911	3400	2612
2600	1900	4600	3753	2675	3605	3850	4019	3500	2691
2600	2000	4750	3824	2725	3697	4050	4127	3575	2770
2600	2100	4950	3895	2775	3789	4150	4216	3675	2829
2600	2200	5150	3966	2825	3881	4300	4324	3750	2908
2600	2300	5250	4017	2850	3953	4450	4432	3850	2987
2600	2400	5450	4088	2900	4045	4600	4521	3925	3045
2600	2500	5650	4159	2950	4138	4750	4629	4025	3124
2600	2600	5850	4230	3000	4230	4900	4737	4125	3203
2700	300	1500	2610	1850	2106	1350	2331	2025	1440
2700	400	1600	2653	1900	2167	1450	2406	2100	1490

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2700	450	1750	2698	1925	2223	1500	2470	2150	1539
2700	500	1850	2744	1950	2279	1600	2514	2200	1569
2700	600	2000	2822	2000	2378	1800	2649	2300	1675
2700	700	2200	2893	2050	2470	1950	2758	2400	1754
2700	800	2450	2984	2125	2582	2100	2866	2500	1833
2700	900	2600	3055	2175	2674	2250	2974	2600	1911
2700	1000	2800	3126	2225	2766	2400	3083	2675	1990
2700	1100	3000	3197	2275	2859	2550	3191	2775	2069
2700	1200	3150	3268	2325	2951	2700	3279	2850	2128
2700	1300	3350	3339	2375	3043	2850	3388	2950	2207
2700	1400	3700	3490	2475	3215	3100	3556	3100	2346
2700	1500	3900	3561	2525	3307	3300	3664	3175	2425
2700	1600	4050	3632	2575	3399	3450	3773	3275	2504
2700	1700	4250	3703	2625	3491	3600	3881	3375	2583
2700	1800	4450	3774	2675	3584	3750	3989	3475	2661
2700	1900	4600	3845	2725	3676	3850	4078	3550	2720
2700	2000	4800	3916	2775	3768	4050	4186	3650	2799
2700	2100	4950	3967	2825	3840	4200	4294	3725	2878
2700	2200	5150	4038	2875	3932	4350	4403	3825	2957
2700	2300	5300	4109	2925	4024	4450	4491	3900	3016
2700	2400	5500	4180	2975	4116	4600	4599	4000	3095
2700	2500	5700	4251	3025	4209	4800	4708	4100	3174
2700	2600	5850	4302	3050	4281	4900	4796	4175	3233
2700	2700	6000	4373	3100	4373	5050	4904	4250	3312
2800	300	1500	2682	1900	2157	1350	2390	2075	1470
2800	400	1600	2725	1950	2218	1450	2465	2150	1519
2800	450	1750	2770	1975	2274	1500	2529	2200	1569
2800	500	1850	2816	2000	2330	1600	2593	2250	1618
2800	600	2000	2894	2050	2429	1800	2708	2350	1704
2800	700	2250	2985	2125	2541	1950	2817	2450	1783
2800	800	2450	3056	2175	2633	2100	2925	2550	1862
2800	900	2600	3127	2225	2725	2250	3033	2650	1941
2800	1000	2800	3198	2275	2817	2400	3142	2725	2020
2800	1100	3000	3269	2325	2910	2550	3250	2825	2099
2800	1200	3150	3340	2375	3002	2750	3358	2925	2178

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2800	1300	3350	3411	2425	3094	2900	3467	3025	2256
2800	1400	3550	3482	2475	3186	3000	3555	3100	2315
2800	1500	3900	3633	2575	3358	3300	3743	3250	2474
2800	1600	4050	3704	2625	3450	3450	3832	3325	2533
2800	1700	4250	3775	2675	3542	3600	3940	3425	2612
2800	1800	4450	3846	2725	3635	3750	4048	3525	2691
2800	1900	4600	3917	2775	3727	3900	4157	3600	2770
2800	2000	4800	3988	2825	3819	4050	4265	3700	2849
2800	2100	5000	4059	2875	3911	4200	4353	3775	2908
2800	2200	5150	4130	2925	4003	4350	4462	3875	2987
2800	2300	5350	4201	2975	4095	4500	4570	3975	3065
2800	2400	5550	4272	3025	4187	4650	4678	4075	3144
2800	2500	5700	4323	3075	4260	4800	4767	4150	3203
2800	2600	5850	4394	3125	4352	4950	4875	4225	3282
2800	2700	6050	4465	3175	4444	5100	4983	4325	3361
2800	2800	6250	4536	3225	4536	5200	5072	4400	3420
2900	300	1550	2774	1975	2228	1350	2469	2150	1519
2900	400	1650	2817	2000	2289	1450	2544	2225	1569
2900	450	1750	2843	2025	2325	1500	2588	2250	1598
2900	500	1850	2888	2050	2381	1600	2652	2300	1648
2900	600	2050	2986	2125	2500	1800	2767	2400	1734
2900	700	2250	3057	2175	2592	1950	2876	2500	1813
2900	800	2450	3128	2225	2684	2100	2984	2600	1891
2900	900	2650	3219	2300	2796	2250	3092	2700	1970
2900	1000	2850	3290	2350	2888	2400	3201	2775	2049
2900	1100	3000	3361	2400	2981	2550	3309	2875	2128
2900	1200	3200	3432	2450	3073	2750	3417	2975	2207
2900	1300	3400	3503	2500	3165	2900	3526	3075	2286
2900	1400	3600	3574	2550	3257	3050	3634	3150	2365
2900	1500	3900	3725	2650	3429	3300	3802	3300	2504
2900	1600	4100	3796	2700	3521	3500	3911	3400	2583
2900	1700	4300	3867	2750	3613	3650	4019	3500	2661
2900	1800	4450	3938	2800	3706	3800	4127	3575	2740
2900	1900	4650	4009	2850	3798	3900	4216	3675	2799
2900	2000	4850	4080	2900	3890	4050	4324	3750	2878

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
2900	2100	5050	4151	2950	3982	4250	4432	3850	2957
2900	2200	5200	4222	3000	4074	4400	4541	3950	3036
2900	2300	5350	4273	3025	4146	4500	4629	4025	3095
2900	2400	5550	4344	3075	4238	4650	4737	4125	3174
2900	2500	5700	4415	3125	4331	4800	4846	4200	3253
2900	2600	5900	4486	3175	4423	5000	4954	4300	3332
2900	2700	6100	4557	3225	4515	5100	5042	4375	3390
2900	2800	6250	4608	3275	4587	5250	5151	4475	3469
2900	2900	6400	4679	3325	4679	5350	5239	4550	3528
3000	300	1550	2846	2025	2279	1350	2528	2200	1549
3000	400	1650	2889	2050	2340	1450	2602	2275	1598
3000	450	1750	2935	2100	2396	1500	2647	2300	1628
3000	500	1850	2960	2100	2432	1600	2711	2350	1677
3000	600	2050	3058	2175	2551	1800	2826	2450	1763
3000	700	2250	3129	2225	2643	2000	2954	2575	1862
3000	800	2450	3220	2300	2755	2150	3063	2675	1941
3000	900	2650	3291	2350	2847	2300	3171	2750	2020
3000	1000	2850	3362	2400	2939	2450	3279	2850	2099
3000	1100	3000	3433	2450	3032	2600	3388	2950	2178
3000	1200	3200	3504	2500	3124	2750	3476	3025	2236
3000	1300	3400	3575	2550	3216	2900	3584	3125	2315
3000	1400	3600	3646	2600	3308	3050	3693	3200	2394
3000	1500	3750	3717	2650	3400	3200	3801	3300	2473
3000	1600	4150	3888	2750	3592	3500	3969	3450	2612
3000	1700	4350	3959	2800	3684	3650	4078	3550	2691
3000	1800	4500	4030	2850	3777	3800	4186	3650	2770
3000	1900	4650	4081	2900	3849	3950	4294	3725	2849
3000	2000	4850	4152	2950	3941	4100	4403	3825	2928
3000	2100	5050	4223	3000	4033	4250	4511	3925	3007
3000	2200	5200	4294	3050	4125	4400	4599	4000	3065
3000	2300	5400	4365	3100	4217	4550	4708	4100	3144
3000	2400	5600	4436	3150	4309	4700	4816	4175	3223
3000	2500	5750	4507	3200	4402	4800	4904	4250	3282
3000	2600	5950	4578	3250	4494	5000	5013	4350	3361
3000	2700	6100	4629	3275	4566	5150	5121	4450	3440

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3000	2800	6300	4700	3325	4658	5250	5209	4525	3499
3000	2900	6450	4771	3375	4750	5400	5318	4625	3578
3000	3000	6650	4842	3425	4842	5550	5426	4700	3657
3100	300	1550	2938	2100	2350	1400	2607	2275	1598
3100	400	1700	2981	2125	2411	1500	2681	2325	1648
3100	450	1750	3007	2150	2447	1550	2726	2375	1677
3100	500	1900	3052	2175	2503	1600	2770	2400	1707
3100	600	2050	3130	2225	2602	1800	2905	2525	1813
3100	700	2300	3221	2300	2714	2000	3013	2625	1891
3100	800	2450	3292	2350	2806	2150	3122	2725	1970
3100	900	2650	3363	2400	2898	2300	3230	2800	2049
3100	1000	2850	3434	2450	2990	2450	3338	2900	2128
3100	1100	3050	3525	2500	3103	2600	3447	3000	2207
3100	1200	3250	3596	2550	3195	2750	3555	3100	2286
3100	1300	3450	3667	2600	3287	2950	3663	3175	2365
3100	1400	3600	3738	2650	3379	3100	3772	3275	2444
3100	1500	3800	3809	2700	3471	3200	3860	3350	2503
3100	1600	4150	3960	2825	3643	3500	4048	3525	2661
3100	1700	4350	4031	2875	3735	3700	4157	3600	2740
3100	1800	4500	4102	2925	3828	3850	4265	3700	2819
3100	1900	4700	4173	2975	3920	3950	4353	3775	2878
3100	2000	4900	4244	3025	4012	4100	4462	3875	2957
3100	2100	5050	4315	3075	4104	4250	4570	3975	3036
3100	2200	5250	4386	3125	4196	4450	4678	4075	3115
3100	2300	5450	4457	3175	4288	4600	4787	4150	3194
3100	2400	5600	4528	3225	4380	4700	4875	4225	3253
3100	2500	5750	4579	3250	4453	4850	4983	4325	3332
3100	2600	5950	4650	3300	4545	5000	5092	4425	3410
3100	2700	6150	4721	3350	4637	5150	5180	4500	3469
3100	2800	6300	4792	3400	4729	5300	5288	4600	3548
3100	2900	6500	4863	3450	4821	5450	5397	4675	3627
3100	3000	6650	4914	3475	4893	5550	5485	4775	3686
3100	3100	6850	4985	3550	4985	5750	5593	4850	3765
3200	300	1550	3011	2150	2401	1400	2666	2325	1627
3200	400	1700	3054	2175	2462	1500	2740	2375	1677

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3200	450	1750	3079	2200	2498	1550	2784	2425	1707
3200	500	1900	3125	2225	2554	1600	2829	2450	1736
3200	600	2100	3223	2300	2673	1800	2964	2575	1842
3200	700	2300	3294	2350	2765	2000	3072	2675	1921
3200	800	2450	3365	2400	2857	2150	3181	2775	2000
3200	900	2700	3456	2450	2969	2300	3289	2850	2079
3200	1000	2900	3527	2500	3061	2450	3397	2950	2158
3200	1100	3050	3598	2550	3154	2600	3506	3050	2236
3200	1200	3250	3669	2600	3246	2750	3614	3150	2315
3200	1300	3450	3740	2650	3338	2950	3722	3225	2394
3200	1400	3600	3811	2700	3430	3100	3831	3325	2473
3200	1500	3800	3882	2750	3522	3250	3939	3425	2552
3200	1600	4000	3953	2800	3614	3350	4027	3500	2611
3200	1700	4350	4124	2925	3806	3700	4216	3675	2770
3200	1800	4550	4195	2975	3899	3850	4324	3750	2849
3200	1900	4750	4266	3025	3991	4000	4432	3850	2928
3200	2000	4900	4337	3075	4083	4150	4541	3950	3006
3200	2100	5100	4408	3125	4175	4300	4649	4050	3085
3200	2200	5250	4459	3175	4247	4450	4737	4125	3144
3200	2300	5450	4530	3225	4339	4600	4846	4200	3223
3200	2400	5600	4601	3275	4431	4750	4954	4300	3302
3200	2500	5800	4672	3325	4524	4900	5062	4400	3381
3200	2600	6000	4743	3375	4616	5000	5151	4475	3440
3200	2700	6150	4814	3425	4708	5200	5259	4575	3519
3200	2800	6350	4885	3475	4800	5350	5367	4650	3598
3200	2900	6500	4936	3500	4872	5450	5456	4725	3657
3200	3000	6700	5007	3550	4964	5600	5564	4825	3735
3200	3100	6850	5078	3600	5056	5750	5672	4925	3814
3200	3200	7050	5149	3650	5149	5900	5761	5000	3873
3300	300	1600	3103	2200	2472	1400	2725	2375	1657
3300	400	1750	3146	2225	2533	1550	2819	2450	1727
3300	450	1800	3171	2250	2569	1600	2863	2500	1756
3300	500	1900	3197	2275	2605	1650	2907	2525	1785
3300	600	2100	3295	2350	2724	1800	3023	2625	1871
3300	700	2300	3366	2400	2816	2000	3131	2725	1950

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3300	800	2500	3457	2450	2928	2150	3239	2825	2029
3300	900	2700	3528	2500	3020	2350	3368	2925	2128
3300	1000	2900	3599	2550	3112	2500	3476	3025	2207
3300	1100	3050	3670	2600	3205	2650	3584	3125	2286
3300	1200	3250	3741	2650	3297	2750	3673	3200	2345
3300	1300	3450	3832	2725	3409	2950	3781	3275	2424
3300	1400	3650	3903	2775	3501	3100	3889	3375	2503
3300	1500	3850	3974	2825	3593	3250	3998	3475	2581
3300	1600	4000	4025	2850	3665	3400	4106	3575	2660
3300	1700	4350	4196	2975	3857	3700	4294	3725	2819
3300	1800	4550	4267	3025	3950	3900	4403	3825	2898
3300	1900	4750	4338	3075	4042	4000	4491	3900	2957
3300	2000	4900	4409	3125	4134	4150	4599	4000	3036
3300	2100	5100	4480	3175	4226	4300	4708	4100	3115
3300	2200	5300	4551	3225	4318	4450	4816	4175	3194
3300	2300	5450	4622	3275	4410	4600	4925	4275	3273
3300	2400	5650	4693	3325	4502	4750	5013	4350	3332
3300	2500	5850	4764	3375	4595	4900	5121	4450	3410
3300	2600	6050	4835	3425	4687	5050	5230	4550	3489
3300	2700	6150	4886	3475	4759	5200	5338	4625	3568
3300	2800	6350	4957	3525	4851	5350	5426	4700	3627
3300	2900	6550	5028	3575	4943	5500	5535	4800	3706
3300	3000	6700	5099	3625	5035	5650	5643	4900	3785
3300	3100	6900	5170	3675	5127	5750	5731	4975	3844
3300	3200	7050	5221	3700	5200	5900	5840	5075	3923
3300	3300	7250	5292	3750	5292	6100	5948	5175	4002
3400	300	1600	3175	2250	2523	1450	2804	2450	1706
3400	400	1750	3218	2300	2584	1550	2878	2500	1756
3400	450	1800	3243	2300	2620	1600	2922	2550	1785
3400	500	1900	3289	2350	2676	1650	2966	2575	1815
3400	600	2100	3367	2400	2775	1800	3082	2675	1901
3400	700	2350	3458	2450	2887	2000	3210	2800	2000
3400	800	2500	3529	2500	2979	2200	3318	2875	2079
3400	900	2700	3600	2550	3071	2350	3427	2975	2158
3400	1000	2900	3691	2625	3183	2500	3535	3075	2236

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3400	1100	3100	3762	2675	3276	2650	3643	3175	2315
3400	1200	3300	3833	2725	3368	2800	3752	3250	2394
3400	1300	3450	3904	2775	3460	2950	3860	3350	2473
3400	1400	3650	3975	2825	3552	3100	3968	3450	2552
3400	1500	3850	4046	2875	3644	3250	4057	3525	2611
3400	1600	4000	4117	2925	3736	3400	4165	3625	2690
3400	1700	4200	4188	2975	3828	3550	4273	3725	2769
3400	1800	4600	4359	3100	4021	3900	4462	3875	2928
3400	1900	4800	4430	3150	4113	4050	4570	3975	3006
3400	2000	4950	4501	3200	4205	4200	4678	4075	3085
3400	2100	5150	4572	3250	4297	4350	4787	4150	3164
3400	2200	5350	4643	3300	4389	4450	4875	4225	3223
3400	2300	5500	4714	3350	4481	4600	4983	4325	3302
3400	2400	5700	4785	3400	4573	4800	5092	4425	3381
3400	2500	5850	4836	3425	4646	4950	5200	4525	3460
3400	2600	6050	4907	3475	4738	5050	5288	4600	3519
3400	2700	6200	4978	3525	4830	5200	5397	4675	3598
3400	2800	6400	5049	3575	4922	5350	5505	4775	3677
3400	2900	6600	5120	3625	5014	5550	5613	4875	3755
3400	3000	6750	5191	3675	5106	5650	5702	4950	3814
3400	3100	6900	5242	3725	5178	5800	5810	5050	3893
3400	3200	7100	5313	3775	5271	5950	5918	5150	3972
3400	3300	7300	5384	3825	5363	6100	6007	5225	4031
3400	3400	7450	5455	3875	5455	6250	6115	5300	4110
3500	300	1650	3267	2325	2594	1450	2862	2500	1736
3500	400	1750	3310	2350	2655	1550	2937	2550	1785
3500	450	1850	3335	2375	2691	1600	2981	2600	1815
3500	500	1900	3361	2400	2727	1650	3025	2625	1844
3500	600	2100	3439	2450	2826	1850	3161	2750	1950
3500	700	2350	3530	2500	2938	2000	3269	2850	2029
3500	800	2500	3601	2550	3030	2200	3377	2925	2108
3500	900	2750	3692	2625	3142	2350	3486	3025	2187
3500	1000	2900	3763	2675	3234	2500	3594	3125	2266
3500	1100	3100	3834	2725	3327	2650	3702	3225	2345
3500	1200	3300	3905	2775	3419	2800	3811	3325	2424

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3500	1300	3450	3976	2825	3511	2950	3919	3400	2503
3500	1400	3650	4047	2875	3603	3100	4027	3500	2581
3500	1500	3850	4118	2925	3695	3300	4136	3600	2660
3500	1600	4000	4189	2975	3787	3450	4244	3700	2739
3500	1700	4200	4260	3025	3879	3550	4332	3775	2798
3500	1800	4600	4431	3150	4072	3900	4541	3950	2977
3500	1900	4800	4502	3200	4164	4050	4629	4025	3036
3500	2000	4950	4573	3250	4256	4200	4737	4125	3115
3500	2100	5150	4644	3300	4348	4350	4846	4200	3194
3500	2200	5350	4715	3350	4440	4500	4954	4300	3273
3500	2300	5500	4786	3400	4532	4650	5062	4400	3352
3500	2400	5700	4857	3450	4624	4800	5151	4475	3410
3500	2500	5900	4928	3500	4717	4950	5259	4575	3489
3500	2600	6050	4999	3550	4809	5100	5367	4650	3568
3500	2700	6250	5070	3600	4901	5250	5476	4750	3647
3500	2800	6450	5141	3650	4993	5350	5564	4825	3706
3500	2900	6600	5212	3700	5085	5550	5672	4925	3785
3500	3000	6750	5263	3725	5157	5700	5781	5025	3864
3500	3100	6950	5334	3775	5249	5850	5889	5100	3943
3500	3200	7150	5405	3825	5342	5950	5977	5200	4002
3500	3300	7300	5476	3875	5434	6100	6086	5275	4080
3500	3400	7450	5527	3925	5506	6250	6174	5350	4139
3500	3500	7650	5598	3975	5598	6400	6282	5450	4218
3600	300	1650	3339	2375	2645	1500	2941	2550	1785
3600	400	1750	3382	2400	2706	1600	3016	2625	1835
3600	450	1850	3408	2425	2742	1650	3060	2675	1864
3600	500	1900	3433	2450	2778	1700	3104	2700	1894
3600	600	2150	3531	2500	2897	1850	3220	2800	1980
3600	700	2350	3602	2550	2989	2000	3328	2900	2059
3600	800	2550	3693	2625	3101	2200	3436	3000	2138
3600	900	2750	3764	2675	3193	2350	3545	3075	2216
3600	1000	2900	3835	2725	3285	2500	3653	3175	2295
3600	1100	3100	3906	2775	3378	2650	3761	3275	2374
3600	1200	3350	3997	2850	3490	2800	3870	3375	2453
3600	1300	3500	4068	2900	3582	2950	3978	3450	2532

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3600	1400	3700	4139	2950	3674	3100	4086	3550	2611
3600	1500	3900	4210	3000	3766	3300	4195	3650	2690
3600	1600	4050	4281	3050	3858	3450	4303	3750	2769
3600	1700	4250	4352	3100	3950	3600	4411	3825	2848
3600	1800	4450	4423	3150	4043	3750	4520	3925	2926
3600	1900	4800	4594	3250	4235	4050	4708	4100	3085
3600	2000	5000	4665	3300	4327	4250	4816	4175	3164
3600	2100	5200	4736	3350	4419	4400	4925	4275	3243
3600	2200	5350	4807	3400	4511	4500	5013	4350	3302
3600	2300	5550	4878	3450	4603	4650	5121	4450	3381
3600	2400	5750	4949	3500	4695	4800	5230	4550	3460
3600	2500	5900	5020	3550	4788	5000	5338	4625	3539
3600	2600	6100	5091	3600	4880	5150	5446	4725	3618
3600	2700	6250	5142	3650	4952	5250	5535	4800	3677
3600	2800	6450	5213	3700	5044	5400	5643	4900	3755
3600	2900	6600	5284	3750	5136	5550	5751	5000	3834
3600	3000	6800	5355	3800	5228	5700	5840	5075	3893
3600	3100	7000	5426	3850	5320	5850	5948	5175	3972
3600	3200	7150	5497	3900	5413	6000	6056	5250	4051
3600	3300	7300	5548	3925	5485	6100	6145	5325	4110
3600	3400	7500	5619	3975	5577	6300	6253	5425	4189
3600	3500	7700	5690	4025	5669	6450	6361	5525	4268
3600	3600	7850	5761	4075	5761	6550	6450	5600	4327
3700	300	1700	3431	2450	2716	1500	3000	2600	1815
3700	400	1800	3474	2475	2777	1600	3075	2675	1864
3700	450	1900	3500	2475	2813	1650	3119	2725	1894
3700	500	1950	3525	2500	2849	1700	3163	2750	1923
3700	600	2150	3603	2550	2948	1850	3278	2850	2009
3700	700	2350	3694	2625	3060	2000	3387	2950	2088
3700	800	2550	3765	2675	3152	2200	3515	3050	2187
3700	900	2750	3836	2725	3244	2350	3623	3150	2266
3700	1000	2950	3927	2800	3356	2550	3732	3250	2345
3700	1100	3150	3998	2850	3449	2700	3840	3350	2424
3700	1200	3350	4069	2900	3541	2850	3948	3425	2503
3700	1300	3500	4140	2950	3633	3000	4057	3525	2581

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3700	1400	3700	4211	3000	3725	3150	4165	3625	2660
3700	1500	3900	4282	3050	3817	3300	4273	3725	2739
3700	1600	4050	4353	3100	3909	3450	4362	3800	2798
3700	1700	4250	4424	3150	4001	3600	4470	3875	2877
3700	1800	4450	4495	3200	4094	3750	4578	3975	2956
3700	1900	4800	4666	3300	4286	4050	4767	4150	3115
3700	2000	5000	4737	3350	4378	4250	4875	4225	3194
3700	2100	5200	4828	3425	4490	4400	4983	4325	3273
3700	2200	5350	4879	3475	4562	4550	5092	4425	3352
3700	2300	5550	4950	3525	4654	4700	5200	4525	3430
3700	2400	5750	5021	3575	4746	4850	5308	4600	3509
3700	2500	5900	5092	3625	4839	5000	5397	4675	3568
3700	2600	6100	5163	3675	4931	5150	5505	4775	3647
3700	2700	6300	5234	3725	5023	5300	5613	4875	3726
3700	2800	6500	5305	3775	5115	5450	5722	4975	3805
3700	2900	6650	5376	3825	5207	5550	5810	5050	3864
3700	3000	6850	5447	3875	5299	5750	5918	5150	3943
3700	3100	7050	5518	3925	5391	5900	6027	5225	4022
3700	3200	7150	5569	3950	5464	6000	6115	5300	4080
3700	3300	7350	5640	4000	5556	6150	6223	5400	4159
3700	3400	7550	5711	4050	5648	6300	6332	5500	4238
3700	3500	7750	5782	4100	5740	6450	6420	5575	4297
3700	3600	7900	5853	4150	5832	6600	6528	5675	4376
3700	3700	8050	5904	4175	5904	6750	6637	5750	4455
3800	300	1700	3503	2500	2767	1550	3079	2675	1864
3800	400	1800	3546	2525	2828	1650	3154	2750	1914
3800	450	1900	3572	2550	2864	1700	3198	2775	1943
3800	500	1950	3597	2550	2900	1750	3242	2825	1973
3800	600	2150	3675	2600	2999	1850	3337	2900	2039
3800	700	2350	3766	2675	3111	2050	3466	3025	2138
3800	800	2550	3837	2725	3203	2200	3574	3100	2216
3800	900	2750	3928	2800	3315	2350	3682	3200	2295
3800	1000	2950	3999	2850	3407	2550	3791	3300	2374
3800	1100	3150	4070	2900	3500	2700	3899	3400	2453
3800	1200	3350	4141	2950	3592	2850	4007	3475	2532

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3800	1300	3550	4232	3000	3704	3000	4116	3575	2611
3800	1400	3750	4303	3050	3796	3150	4224	3675	2690
3800	1500	3900	4374	3100	3888	3300	4332	3775	2769
3800	1600	4100	4445	3150	3980	3500	4441	3850	2848
3800	1700	4300	4516	3200	4072	3650	4549	3950	2926
3800	1800	4450	4587	3250	4165	3750	4637	4025	2985
3800	1900	4650	4658	3300	4257	3900	4746	4125	3064
3800	2000	5050	4829	3425	4449	4250	4954	4300	3243
3800	2100	5250	4900	3475	4541	4450	5062	4400	3322
3800	2200	5400	4971	3525	4633	4550	5151	4475	3381
3800	2300	5600	5042	3575	4725	4700	5259	4575	3460
3800	2400	5800	5113	3625	4817	4850	5367	4650	3539
3800	2500	5950	5184	3675	4910	5000	5476	4750	3618
3800	2600	6150	5255	3725	5002	5200	5584	4850	3697
3800	2700	6350	5326	3775	5094	5300	5672	4925	3755
3800	2800	6500	5397	3825	5186	5450	5781	5025	3834
3800	2900	6700	5468	3875	5278	5600	5889	5125	3913
3800	3000	6850	5519	3925	5350	5750	5997	5200	3992
3800	3100	7050	5590	3975	5442	5900	6086	5275	4051
3800	3200	7200	5661	4025	5535	6050	6194	5375	4130
3800	3300	7400	5732	4075	5627	6200	6302	5475	4209
3800	3400	7600	5803	4125	5719	6300	6391	5550	4268
3800	3500	7750	5854	4150	5791	6500	6499	5650	4347
3800	3600	7900	5925	4200	5883	6650	6607	5725	4426
3800	3700	8100	5996	4250	5975	6750	6696	5800	4484
3800	3800	8300	6067	4300	6067	6900	6804	5900	4563
3900	300	1750	3595	2550	2838	1550	3138	2725	1894
3900	400	1850	3638	2575	2899	1650	3213	2800	1943
3900	450	1950	3664	2600	2935	1700	3257	2825	1973
3900	500	2000	3689	2625	2971	1750	3301	2875	2002
3900	600	2150	3747	2650	3050	1850	3396	2950	2068
3900	700	2350	3838	2725	3162	2050	3525	3075	2167
3900	800	2600	3929	2800	3274	2200	3633	3150	2246
3900	900	2750	4000	2850	3366	2350	3741	3250	2325
3900	1000	2950	4071	2900	3458	2550	3850	3350	2404

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
3900	1100	3200	4162	2950	3571	2700	3958	3450	2483
3900	1200	3350	4233	3000	3663	2850	4066	3525	2561
3900	1300	3550	4304	3050	3755	3000	4175	3625	2640
3900	1400	3750	4375	3100	3847	3150	4283	3725	2719
3900	1500	3900	4446	3150	3939	3300	4391	3825	2798
3900	1600	4100	4517	3200	4031	3500	4500	3900	2877
3900	1700	4300	4588	3250	4123	3650	4608	4000	2956
3900	1800	4450	4659	3300	4216	3800	4716	4100	3035
3900	1900	4650	4730	3350	4308	3950	4825	4200	3114
3900	2000	5100	4921	3500	4520	4250	5013	4350	3273
3900	2100	5250	4992	3550	4612	4450	5121	4450	3352
3900	2200	5450	5063	3600	4704	4600	5230	4550	3430
3900	2300	5650	5134	3650	4796	4750	5338	4625	3509
3900	2400	5800	5205	3700	4888	4900	5446	4725	3588
3900	2500	6000	5276	3750	4981	5000	5535	4800	3647
3900	2600	6150	5327	3775	5053	5200	5643	4900	3726
3900	2700	6350	5398	3825	5145	5350	5751	5000	3805
3900	2800	6500	5469	3875	5237	5500	5860	5075	3884
3900	2900	6700	5540	3925	5329	5600	5948	5175	3943
3900	3000	6900	5611	3975	5421	5750	6056	5250	4022
3900	3100	7050	5682	4025	5513	5950	6165	5350	4100
3900	3200	7250	5753	4075	5606	6100	6273	5450	4179
3900	3300	7450	5824	4125	5698	6200	6361	5525	4238
3900	3400	7600	5875	4175	5770	6350	6470	5625	4317
3900	3500	7750	5946	4225	5862	6500	6578	5700	4396
3900	3600	7950	6017	4275	5954	6650	6666	5775	4455
3900	3700	8150	6088	4325	6046	6800	6775	5875	4534
3900	3800	8300	6159	4375	6138	6950	6883	5975	4613
3900	3900	8450	6210	4400	6210	7050	6971	6050	4672
4000	300	1750	3668	2600	2889	1550	3197	2775	1923
4000	400	1850	3711	2625	2950	1650	3271	2850	1973
4000	450	1950	3736	2650	2986	1700	3316	2875	2002
4000	500	2000	3762	2675	3022	1750	3360	2925	2032
4000	600	2200	3840	2725	3121	1900	3475	3025	2118
4000	700	2350	3911	2775	3213	2050	3583	3125	2196

WYE		Standard Dimensions for 45° Wyes				Standard Dimensions for 60° Wyes			
Header	Branch	H	E	B	F	H	E	B	F
DN mm	DN mm	mm	mm	mm	mm	mm	mm	mm	mm
4000	800	2600	4002	2850	3325	2200	3692	3200	2275
4000	900	2750	4073	2900	3417	2350	3800	3300	2354
4000	1000	3000	4164	2950	3529	2550	3928	3425	2453
4000	1100	3200	4235	3000	3622	2750	4037	3500	2532
4000	1200	3350	4306	3050	3714	2900	4145	3600	2611
4000	1300	3550	4377	3100	3806	3050	4253	3700	2690
4000	1400	3750	4448	3150	3898	3200	4362	3800	2769
4000	1500	3900	4519	3200	3990	3350	4470	3875	2848
4000	1600	4150	4610	3275	4102	3500	4558	3950	2906
4000	1700	4350	4681	3325	4194	3650	4667	4050	2985
4000	1800	4500	4752	3375	4287	3800	4775	4150	3064
4000	1900	4650	4803	3400	4359	3950	4883	4250	3143
4000	2000	4850	4874	3450	4451	4100	4992	4325	3222
4000	2100	5250	5065	3600	4663	4450	5180	4500	3381
4000	2200	5450	5136	3650	4755	4600	5288	4600	3460
4000	2300	5650	5207	3700	4847	4750	5397	4675	3539
4000	2400	5800	5278	3750	4939	4900	5505	4775	3618
4000	2500	6000	5349	3800	5032	5050	5613	4875	3697
4000	2600	6200	5420	3850	5124	5200	5722	4975	3775
4000	2700	6350	5491	3900	5216	5350	5810	5050	3834
4000	2800	6550	5562	3950	5308	5500	5918	5150	3913
4000	2900	6750	5633	4000	5400	5650	6027	5225	3992
4000	3000	6900	5704	4050	5492	5800	6135	5325	4071
4000	3100	7100	5775	4100	5584	5950	6223	5400	4130
4000	3200	7250	5826	4125	5657	6100	6332	5500	4209
4000	3300	7450	5897	4175	5749	6250	6440	5600	4288
4000	3400	7600	5968	4225	5841	6400	6548	5675	4367
4000	3500	7800	6039	4275	5933	6500	6637	5750	4426
4000	3600	8000	6110	4325	6025	6700	6745	5850	4504
4000	3700	8150	6161	4375	6097	6850	6853	5950	4583
4000	3800	8300	6232	4425	6189	6950	6942	6025	4642
4000	3900	8500	6303	4475	6281	7100	7050	6125	4721
4000	4000	8700	6374	4525	6374	7250	7158	6200	4800

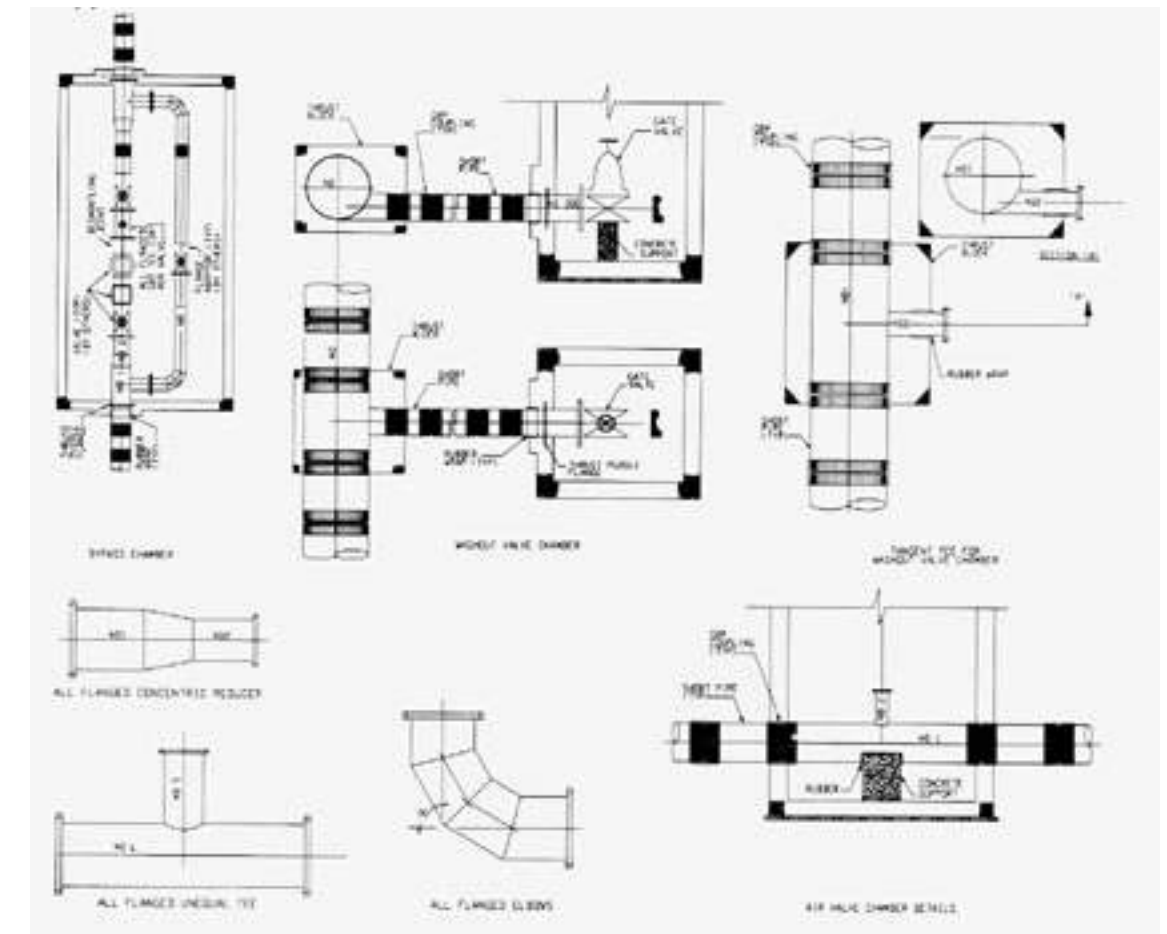
E. FLANGES

Flanges and blinds could be provided for the complete range of diameters with drilling pattern to match any international standard required such as DIN, ISO, ANSI, AWWA, JIS etc... or to client requirements.



F. CUSTOM DESIGNED FITTINGS

Future Pipe Industries can provide custom designed fittings for Air Valve Chambers, Wash-Out Chambers, By-Pass Chambers, in addition to all flanged fittings for specific applications.



10. VISUAL PROPERTIES

A. EXTERIOR VISUAL PROPERTIES

The exterior surface of FIBERSTRONG® pipe, joints and fittings shall be commercially free of the following visual irregularities:

Fuzz	Glass fibers loosely adhering to the pipe that are not wet out with resin.
Protruding fibers	Glass fibers sticking out from face that are wet out with resin.
Resin runs	Runs of resin and sand on surface of pipe.
Dry area	Area in laminate with glass not wet out with resin.
Hand lay-up ragged edges	Ragged edges, areas at the edge of hand lay-up that are not rolled down properly or that are rough.

B. VISUAL DEFECTS LIMITS

The following visual limits apply:

Visual defect	Definition	Allowable Limits	
		External Surface	Internal Surface
Delamination	Separation in the laminate.	None	None
Blisters	Light straw colored areas resulting from too hot a cure.	None to exceed 13mm in Dia.	None to exceed 4mm in Dia.
Crazes	Cracks on inner surface usually star shaped; caused by sharp impact.	N/A	None
Surface pits and voids	Small air pockets on the surface or directly beneath are solid. Surface mat can be broken by finger nail.	N/A	None greater than 2mm deep and 20mm Dia. Or greater than 4mm deep of any Dia.
Wrinkles, grooves and band depressions	Smooth Irregularities on liner surface.	N/A	None greater than 3mm deep
Haystacks	Accumulations of glass, resin and sand on exterior surface.	None greater than 30mm Dia.	N/A
Torn edges, end delamination and end gouges	Tears and rips in the edges of cuts.	N/A	None that will effect the integrity of the joints.
Ground area	Area around lay-up which has been abraded but lay-up does not cover or has not been coated.	Permitted	None

11. REPAIR WORK

Repairs to the internal and external layers shall not exceed 5% of the total surface area. No Structural repair work is allowed.

The number of repairs will not exceed an average of one (1) per one (1) meter length of pipe in each surface.

Pipe sections may contain factory lay-up joints which shall not be considered as repairs.

12. MARKING AND IDENTIFICATION

Each pipe section and coupling shall be marked with the following information:

- 1) Company name
- 2) Manufacturing standard
- 3) Pipe diameter
- 4) Pressure class
- 5) Stiffness class
- 6) Pipe serial number
- 7) Manufacturing date

Specific marking requirement by customers could be arranged; Future Pipe Industries marks the product accordingly while maintaining traceability.