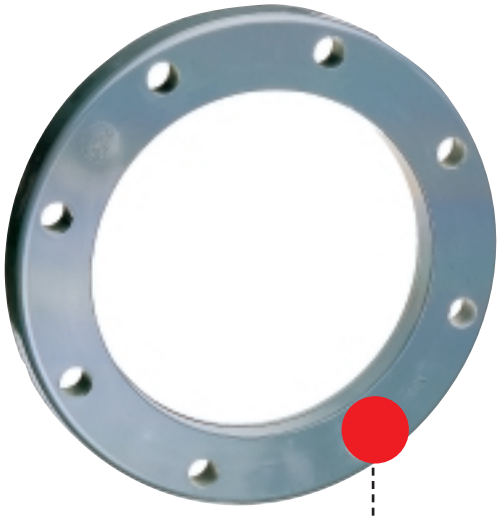
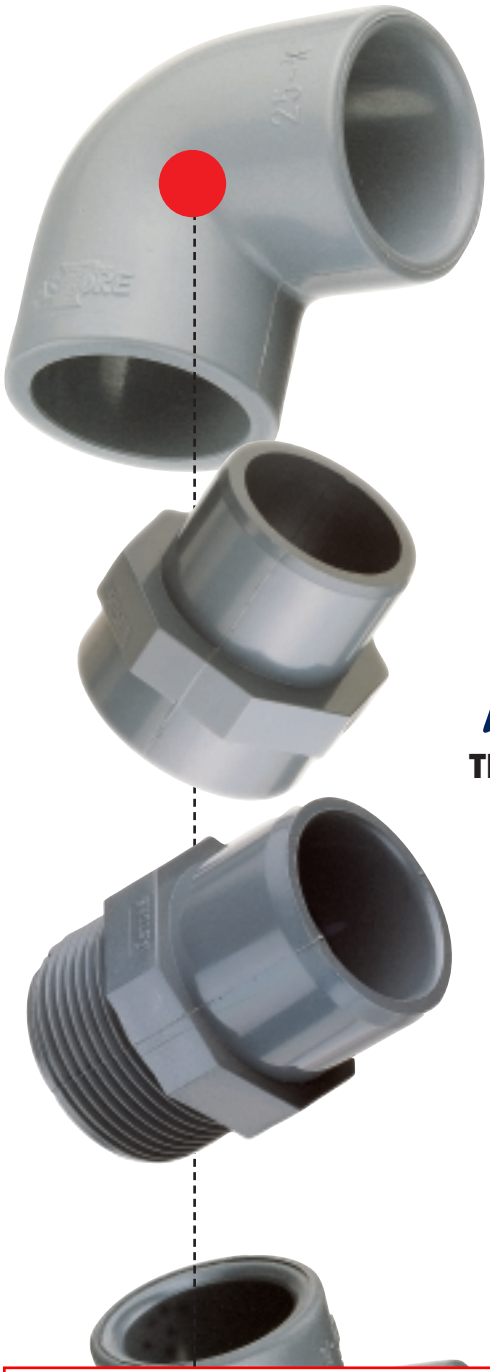
CATALOGUE

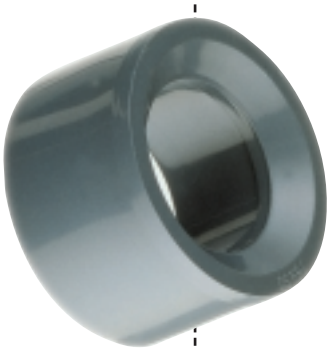
PVC-U AND ABS

IMPERIAL

PIPES AND FITTINGS







ASTORE

THERMOPLASTIC PIPEWORK SYSTEMS

This Product Literature is currently being updated. This document does not contain all of the Technical Information.

For Technical Information, including detailed information on jointing procedures together with design and installation, please contact us on 01543 272400

Introduction

Founded in 1970, Astore has and continues to develop advanced techniques in the production of thermoplastic pressure fittings and valves.

Specialists in the supply of cost-effective pipe systems to a wide range of market sectors, Astore have the ability to be flexible and responsive to the demands of our customers.

As an indication of commitment to quality manufacture, Astore PVC-U and ABS fittings and pipework are UK Water Regulations Advisory Scheme approved. The Italian Institute of Plastics (I.I.P.) has granted certificates of conformity for the Astore production systems in compliance with UNI EN ISO 9002 (Certificate No 354).

Astore products are available via a network of approved stockists in the UK, serviced by our central sales and distribution centre in Cannock in the Midlands.

Product Profile

Astore offers a complete range of imperial size PVC-U and ABS pressure pipe, fittings and valves (both manual and actuated) to satisfy the requirements of installers and specifiers.

The systems offered by Astore encompass a wide range of pipes and fittings to BS imperial and Threaded standards. A complete range of pipeline accessories in PVC-U and ABS are also available. The products are divided into four groups: pipes (pages 8-9), imperial fittings (pages 10-13), stub flanges, gaskets and pipe brackets (pages 14-17) transition fittings (pages 18-22). For further information concerning metric and threaded fittings please consult the relevant Astore metric PVC-U pressure fitting catalogue.

This user's guide shows the design and installation techniques required to achieve a safe, long lasting, high integrity system.

Standards and Approvals

Astore imperial size products are manufactured in accordance with the following standards:

PVC-U pipe: Imperial BS 3505 - 3506, Metric Din 8061-2 Kiwa 49 (rev.1)
ABS pipe: BS 5391 part 1
PVC-U fittings: Imperial BS 4346 part 1, Threaded BS 21, ISO R7 Din 2999
ABS fittings: BS 5392 part 1

Astore PVC-U fittings are UK Water Regulations Advisory Scheme approved and listed (licence n° 9902025). Astore ABS fittings are UK Water Regulations Advisory Scheme approved and listed (licence n° 9902026).

WRAS APPROVED PRODUCT

Materials

PVC-U

Unplasticised Polyvinyl Chloride raw material has the following general characteristics:

Ultimate tensile strength (23°C)	53 MPa
Tensile strength at break	45.00 MPa
Young's Modulus	3060 MPa
Compressive strength	55 MN/m^2
Poisson's Ratio	0.35
Izod impact strength (23°C) notched	0.08 kJ/m^2
Specific gravity	1.41
Softening point (BS 2782 Part 1 method 120B)	77°C
Linear coefficient of thermal expansion	7.8 (x10^{-5}/°C)
Thermal conductivity	0.147 W/m°C
Specific heat	0.84-2.1 kJ/kg.K

ABS

Acrylonitrile Butadiene Styrene raw material has the following general characteristics:

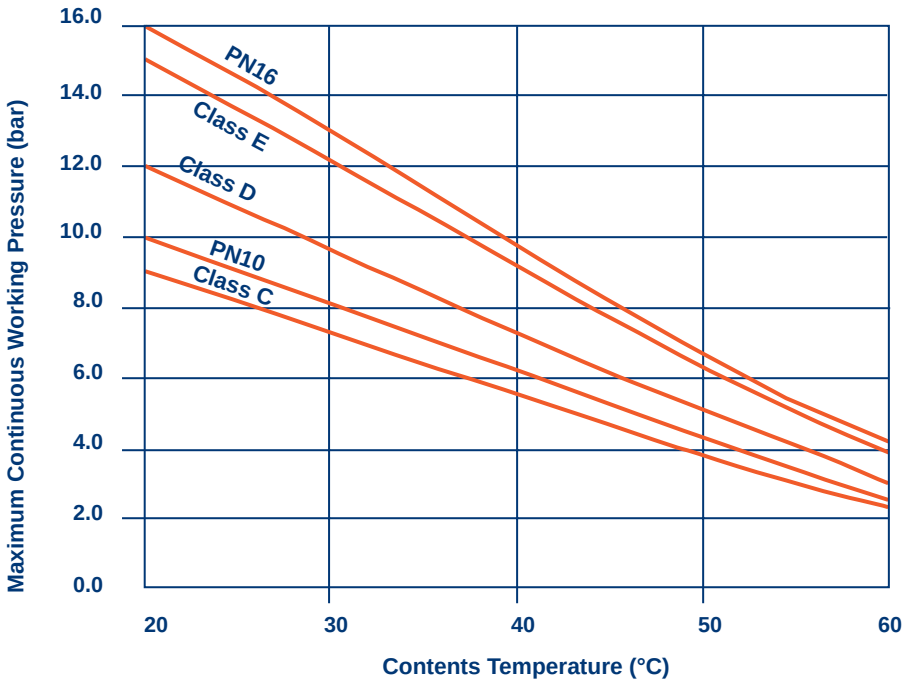
Tensile strength at yield (23°C)	45 MPa
Tensile modulus of elasticity	2200 MPa
Poisson's ratio	0.35
Izod impact strength (23°C) notched	35 kJ/m^2
Charpy impact strength (23°C) notched	20 kJ/m^{-2}
Specific gravity	1.04
Softening point (BS 2782 Part 1 Method 120B)	99°C
Linear coefficient of thermal expansion	10.1(x10^{-5}/°C)
Thermal conductivity	0.157 W/m°C
Specific heat	2.1 kJ/kg.K
Self ignition temperature	540°C

The raw material used for Gaskets and 'O' Rings is EPDM (Ethylene Propylene Rubber).

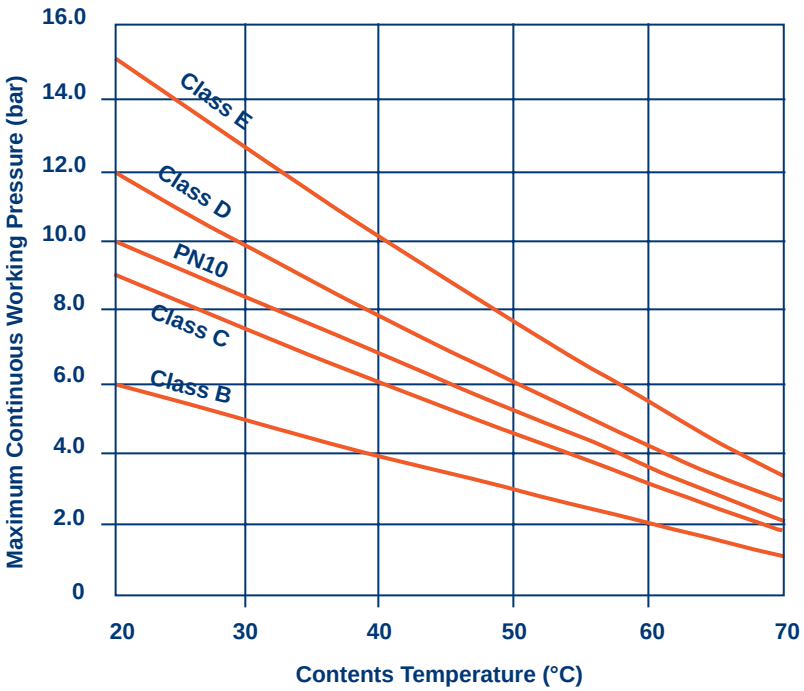
Working Conditions

The graphs below show the pressure/temperature relationship. PVC-U systems should not be used at temperatures in excess of +60°C or below +5°C, ABS systems are not recommended for use at temperatures in excess of 70°C or below -40°C.

PVC-U Pressure Temperature Relationship



ABS Pressure Temperature Relationship



Caution

PVC-U pipework systems should never be used for compressed air applications.

When used correctly, Astore ABS systems have a life expectancy of 50 years. However, this can be compromised by poor installation practices or contamination by some synthetic oils and lubricants. These synthetic oils and lubricants can sometimes be used in the primary refrigeration cycle or in the manufacture of some refrigeration components and are incompatible for use with ABS systems. Before Astore ABS pipework is coupled to any heat exchangers, evaporation coils or similar equipment it is imperative to check with your supplier to ensure that the equipment is free from contaminant oils before proceeding. If this is not possible, the components must be thoroughly flushed through with methylated spirit, followed by water, to remove any contaminant oils from the manufacturing process before installation.

For details of the chemical resistance data refer to the 'Astore Guide to Chemical Resistance' technical brochure.

Flow Calculations

Pressure drop due to friction can be determined for practical purposes using the flow nomogram overleaf.

The pressure drop at a given flow rate can be determined as follows:

1. Obtain the internal diameter (ID) of the pipe to be used by referring to the pipe dimension tables on pages 8 and 9.
2. Mark this diameter on the Internal Diameter Scale.
3. Mark the required flow rate in litres per second on Flow Rate Scale.
4. Draw a straight line connecting these two points and extend through the flow Velocity and the Hydraulic Gradient Scales.
5. The velocity of flow in metres per second is determined from the intersection with the Flow Velocity Scale.
6. The frictional head loss in metres per 100 metres of pipe can then be read off the Hydraulic Gradient Scale.

Pressure drop in fittings

To determine the total pressure drop in the system, the total straight pipe length calculated for the fittings is added to the total straight pipe length to obtain the total drop.

The pressure drop in fittings can be calculated with the following formula:

$$L = K \times ID$$

Where L is the equivalent pipe length (in metres), K is the fittings constant (different for each kind of fitting), ID is the fitting internal diameter in mm.

The fittings constant (K) is shown below:

Elbow 90°	0.030
Elbow 45°	0.014
Tee 90° (straight through)	0.012
Tee 90° (side branch)	0.060
Bends 90°	0.012
Reducing bush (per size reduction)	0.150

These values are included as a guide to facilitate calculation of overall system performance and should not be used in isolation.

Flow Nomogram

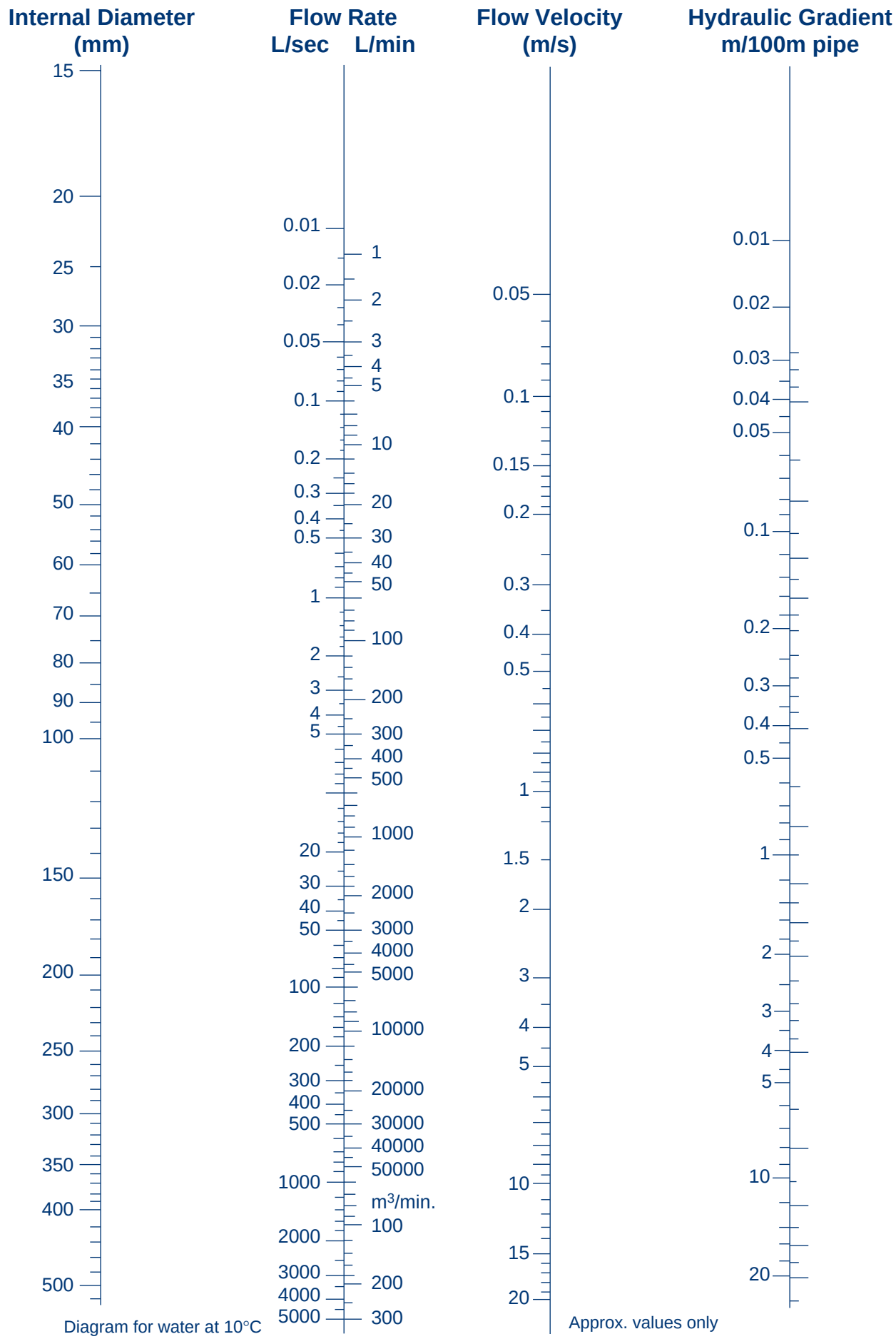


Diagram for water at 10°C

Approx. values only

THE RECOMMENDED DISTANCE BETWEEN SUPPORTS FOR PIPES FIXED IN A HORIZONTAL POSITION AND FILLED WITH WATER IS GIVEN IN THE TABLE BELOW. IF THE CONTENTS HAVE A SPECIFIC GRAVITY GREATER THAN 1, THE DISTANCE MUST BE DECREASED BY DIVIDING THE RECOMMENDED CENTRE DISTANCE BY SPECIFIC GRAVITY.

HORIZONTAL SUPPORT DISTANCE IN METRES			
	PVC-U/ABS	PVC-U/ABS	ABS
PIPE SIZE	AT 20°C	AT 50°C	AT 70°C
3/8"	0.8	0.5	0.4
1/2"	0.9	0.6	0.5
3/4"	1.0	0.7	0.6
1"	1.1	0.8	0.7
1 1/4"	1.2	0.9	0.7
1 1/2"	1.3	1.0	0.7
2"	1.4	1.1	0.8
2 1/2"	1.5	1.2	0.8
3"	1.6	1.2	0.9
4"	1.8	1.3	1.0
5"	2.0	1.5	1.1
6"	2.1	1.6	1.2
8"	2.3	1.8	1.5

NB. FOR VERTICAL PIPES, THE SUPPORT CENTRES SHOWN ABOVE CAN BE INCREASED BY 50%

Jointing Procedures

The solvent cement operates by chemically softening the outside of the pipe and the inside of the fitting. Joint integrity is greatly reduced if these surfaces are not absolutely clean and properly prepared.

1) The pipe must be cut clean and square. A suitable wheel cutter will eliminate swarf. A saw may be used, however this will create dust which may enter the pipework system.

2) File a chamfer, approximately 3mm x 45°. This prevents the solvent cement layer being scraped from the surface of the fitting when the joint is assembled.

3) Mark the pipe a known distance from the end and clear of the area to be abraded. This should be used to check the pipe penetration into the socket after assembly.

4) Thoroughly abrade the end of the pipe over a length equal to depth of the fitting socket, using clean coarse emery cloth.

5) Thoroughly abrade the inside surface of the fitting socket.

6) Clean thoroughly the abraded surfaces of pipe and fittings using a clean, lint free cloth or paper towel, moistened with Astore MEK cleaner.

7) Using a clean brush, apply the Astore solvent cement to the pipe and fitting using longitudinal strokes. The abraded areas should be completely covered with the cement. The amount required will vary with pipe diameter and the fit between pipe and fitting, but should be such in all cases that the cement is still liquid when pipe and fitting are assembled. It is important to apply cement quickly, to enable assembly without excessive force being required.

8) Immediately after application of cement, push pipe fully home into the fitting. Do not twist. Hold the pipe and the fitting for times varying from a few seconds on sizes 3/8" to 1 minute on sizes 8" and above. Application of the correct amount of cement will result in a neat bead of cement at the edge of the fitting and the pipe. Excessive deposits inside the fittings must be avoided as these can weaken the wall, particularly on small sizes. When working under cold conditions make sure the joints are free from frost and moisture and allow extra curing time to compensate for the lower temperature.

9) Wipe off excess cement from outside of the joint.

The drying time for joints will vary with fit, amount of solvent cement applied, ambient temperature and working pressure. It is recommended that whenever possible, joints are left to cure for 24 hours before the test pressure is applied. However, it is recognised there will be times when joints will need to be put into service within a few hours of being made. A rough but safe working guide, where contents temperature will not exceed 20°C, is 1 hour per bar for systems up to 4". For larger sizes increase this time to 1 1/2 hours per bar. In any event joints should be allowed to cure for a minimum of 4 hours.

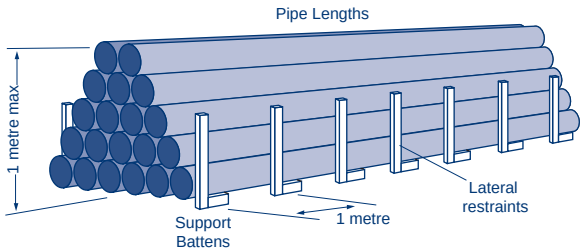
Handling and Storage

Care should be taken at all stages of handling, transportation and storage. Pipe must be transported by a suitable vehicle and properly loaded and unloaded, e.g. wherever possible moved by hand or mechanical lifting equipment. It must not be dragged across the ground.

The storage should be flat, level and free from sharp stones.

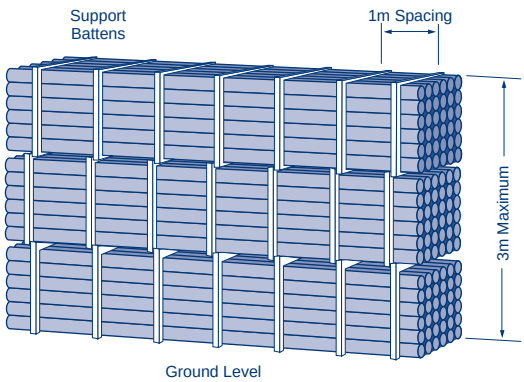
Lengths

Pipe lengths stored individually should be stacked in a pyramid not more than one metre high, with the bottom layer fully restrained by wedges. Where possible, the bottom layer of pipes should be laid on timber battens at one-metre centres. On site, pipes may be laid out individually in strings. (Where appropriate, protective barriers should be placed with adequate warning signs and lamps.)



Bundles

Bundled packs of pipe should be stored on clear, level ground with the battens supported from the outside by timbers or concrete blocks. For safety, bundled packs should not be stacked more than three metres high.



Smaller pipes may be nested inside larger pipes. Side bracing should be provided to prevent stack collapse.

Similar precautions should be taken with fittings and these should be kept in protective wrappings until required for use.

Weathering

Prolonged storage (greater than 1 month) or storage in areas where high temperature is anticipated, the stack height should never exceed 4 layers or 1 metre maximum height. Such stacks should be protected from the effects of weathering by placing an opaque covering over them. If fixed to the side bracing the sheets will provide protected and shaded conditions and allow a free passage of air around the pipes.

Where the pipes are to be installed in locations likely to be permanently exposed to prolonged periods of strong sunlight, such as in tropical countries, the life can be extended by painting the pipe with household gloss or emulsion. Cellulose based paints should only be used with extreme care and close attention paid to the manufacturers instructions.

Pipe Contents Identification

Do not put self-adhesive labels directly onto pipe surface as this can cause stress cracking. It is recommended that some sort of barrier such as aluminium foil, is placed between the pipe and identification label.

Testing

It is suggested that the following test procedure be followed, after joints have been allowed to dry for the appropriate minimum time (at least 24 hours):

The system should be divided conveniently into test sections. Fill the section with cold water making sure that no air pockets remain. Do not pressurise at this stage.

Check the system for leaks. If no leaks are apparent check for and remove any remaining air. Increase pressure up to 3 bar. *Do not pressurise further at this stage.

Leave the section pressurised for 10 minutes. If the pressure decays, inspect for leaks and rectify as necessary. If the pressure remains constant, slowly increase the hydrostatic pressure to 1½ times the nominal operating pressure.

Leave the section pressurised for a period not exceeding 1 hour. During this time the pressure should not change.

CAUTION

Personnel must stand well clear when pressure testing systems.

Similarly, under no circumstances should pressure tests be carried out using pressurised gases. Such a test could be extremely dangerous and does not serve any useful purpose.

*Note:

If extended times are required to achieve hydrostatic pressure, either leakage has occurred or air remains in the line. Inspect for leakage and if none is apparent, reduce the pressure and check for trapped air which must be removed before further pressurisation is commenced.

If a leakage source is difficult to establish it is acceptable to pressure the line using air or nitrogen to a maximum pressure of 1.5 bar. Test joints etc. with a soap solution.

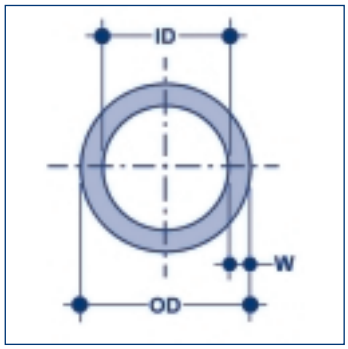
Health and Safety at Work Act and COSHH Regulations

Attention is drawn to the requirements in the U.K. of this Act and to the 1988 Control of Substances Hazardous to Health (COSHH) Regulations.

Astore UK cannot accept responsibility for accidents arising from the misuse of its products because of bad installation or incorrect application.

PRC

PVC-U PRESSURE PIPE CLASS C

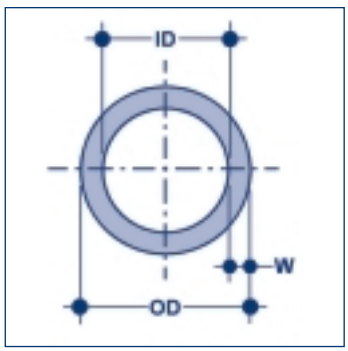


Nom Dia.	OD mm	ID mm	Min. Wall (w) mm	Weight kg/m	Code
2"	60.2	55.2	2.5	0.646	**PRC.0630**
3"	88.7	81.7	3.5	1.421	**PRC.0900**
4"	114.1	105.1	4.5	2.334	**PRC.1100**
5"	140.0	129.0	5.5	3.485	**PRC.1400**
6"	168.0	154.8	6.6	4.997	**PRC.1600**
8"	218.8	203.2	7.8	7.693	**PRC.2250**

6 METRE LENGTHS

PRE

PVC-U PRESSURE PIPE CLASS E

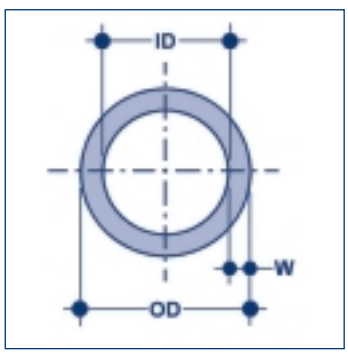


Nom Dia.	OD mm	ID mm	Min. Wall (w) mm	Weight kg/m	Code
1/2"	21.2	17.8	1.7	0.170	**PRE.0200**
3/4"	26.6	22.8	1.9	0.240	**PRE.0250**
1"	33.4	29.0	2.2	0.335	**PRE.0320**
1 1/4"	42.1	36.7	2.7	0.509	**PRE.0400**
1 1/2"	48.1	41.9	3.1	0.661	**PRE.0500**
2"	60.2	52.4	3.9	1.036	**PRE.0630**
3"	88.7	77.3	5.7	2.220	**PRE.0900**
4"	114.1	99.5	7.3	3.652	**PRE.1100**
6"	168.0	146.4	10.8	7.894	**PRE.1600**

6 METRE LENGTHS

PAC

ABS PRESSURE PIPE CLASS C



Nom Dia.	OD mm	ID mm	Min. Wall (w) mm	Weight kg/m	Code
1"	33.4	29.8	1.9	0.220	**PAC.0320**
1 1/4"	42.1	37.4	2.4	0.340	**PAC.0400**
1 1/2"	48.1	42.9	2.7	0.450	**PAC.0500**
2"	60.2	53.5	3.4	0.700	**PAC.0630**
2 1/2"	75.0	65.8	4.7	1.350	**PAC.0750**
3"	88.7	78.9	5.0	1.480	**PAC.0900**
4"	114.1	101.5	6.4	2.480	**PAC.1100**
5"	140.0	122.6	8.8	4.650	**PAC.1400**
6"	168.0	149.5	9.4	5.470	**PAC.1600**
8"	218.8	194.7	12.2	9.530	**PAC.2250**

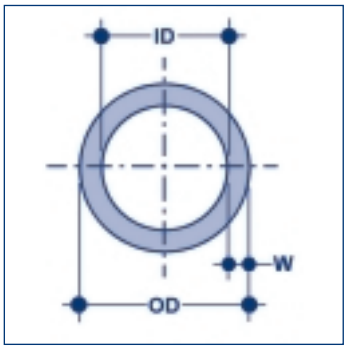
6 METRE LENGTHS

ABS PRESSURE PIPE CLASS D

PAD

Nom Dia.	OD mm	ID mm	Min. Wall (w) mm	Weight kg/m	Code
6"	168.0	143.7	12.3	6.88	**PAD.1600**

6 METRE LENGTHS

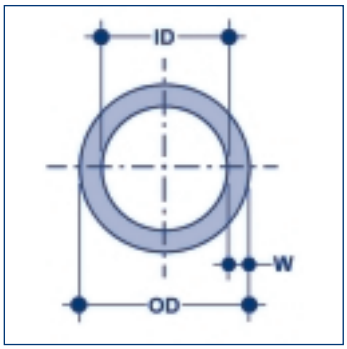


ABS PRESSURE PIPE CLASS E

PAE

Nom Dia.	OD mm	ID mm	Min. Wall (w) mm	Weight kg/m	Code
1/2"	21.2	17.6	1.9	0.140	**PAE.0200**
3/4"	26.6	21.9	2.4	0.210	**PAE.0250**
1"	33.4	27.6	3.0	0.330	**PAE.0320**
1 1/4"	42.1	34.6	3.8	0.520	**PAE.0400**
1 1/2"	48.1	39.5	4.4	0.680	**PAE.0500**
2"	60.2	49.5	5.4	1.060	**PAE.0630**
3"	88.7	72.7	8.1	2.280	**PAE.0900**
4"	114.1	93.7	10.3	3.760	**PAE.1100**

6 METRE LENGTHS

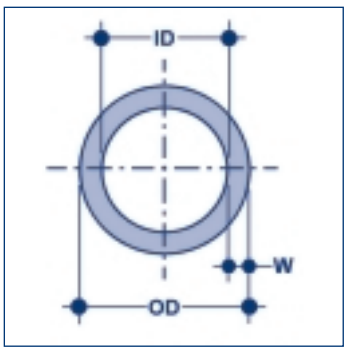


ABS PRESSURE PIPE CLASS T

PAT

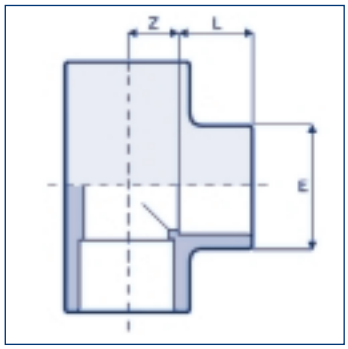
Nom Dia.	OD mm	ID mm	Min. Wall (w) mm	Weight kg/m	Code
3/8"	17.0	10.3	3.4	0.160	**PAT.0160**
1/2"	21.2	14.4	3.5	0.220	**PAT.0200**
3/4"	26.6	19.7	3.5	0.290	**PAT.0250**
1"	33.4	25.2	4.2	0.440	**PAT.0320**
1 1/4"	42.1	32.0	5.1	0.680	**PAT.0400**
1 1/2"	48.1	36.7	5.8	0.870	**PAT.0500**
2"	60.2	46.3	7.0	1.310	**PAT.0630**

6 METRE LENGTHS



TI4

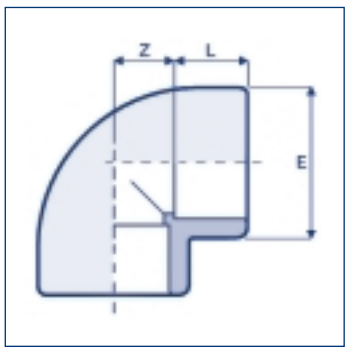
TEE PLAIN



Nom Dia.	L	Z	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	11	28	**TI4.0200**	35	27	400
3/4"	19	14	34	**TI4.0250**	50	38	220
1"	22	17	42	**TI4.0320**	70	53	130
1 1/4"	26	21	51	**TI4.0400**	120	91	70
1 1/2"	31	26	61	**TI4.0500**	185	141	90
2"	38	33	75	**TI4.0630**	305	232	45
2 1/2"	44	39	89	**TI4.0750**	505	384	30
3"	51	47	106	**TI4.0900**	795	604	18
4"	61	57	129	**TI4.1100**	1415	1075	10
5"	76	72	163	**TI4.1400**	2740	2082	4
6"	86	82	186	**TI4.1600**	3855	2930	3
8"	115	116	257	**TI4.2250**	10500	-	-
8"	115	100	257	**TI4.2250**	-	9600	-
10"	139	148	306	**TI4.2800**	18600	N/A	-
12"	165	175	363	**TI4.3150**	27200	N/A	-

GO4

ELBOW 90° PLAIN

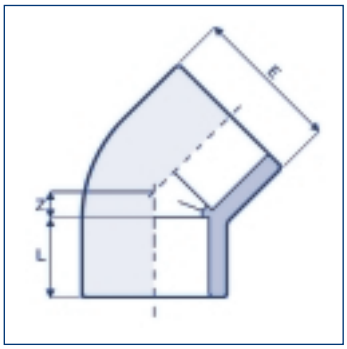


Nom Dia.	L	Z	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	11	28	**GO4.0200**	25	19	600
3/4"	19	14	34	**GO4.0250**	35	27	350
1"	22	17	42	**GO4.0320**	35	27	200
1 1/4"	26	21	51	**GO4.0400**	95	72	100
1 1/2"	31	26	61	**GO4.0500**	145	110	60
2"	38	33	75	**GO4.0630**	230	175	60
2 1/2"	44	39	89	**GO4.0750**	385	293	40
3"	51	47	106	**GO4.0900**	600	456	25
4"	61	57	129	**GO4.1100**	1020	775	14
5"	76	72	163	**GO4.1400**	2125	1615	6
6"	86	82	186	**GO4.1600**	2920	2219	4
8"	115	116	257	**GO4.2250**	8850	-	-
8"	115	112	256	**GO4.2250**	-	6900	-
10"	140	146	307	**GO4.2800**	13300	N/A	-
12"	165	175	363	**GO4.3150**	20300	N/A	-

ELBOW 45° PLAIN

GY4

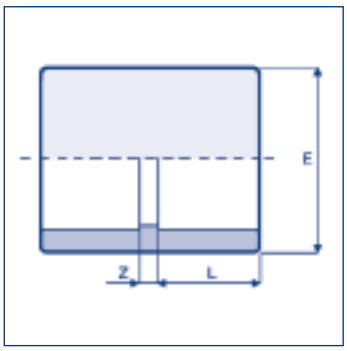
Nom Dia.	L	Z	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	5	28	**GY4.0200**	20	15	600
3/4"	19	6	34	**GY4.0250**	25	19	450
1"	22	8	42	**GY4.0320**	45	34	200
1 1/4"	26	10	51	**GY4.0400**	75	57	130
1 1/2"	31	12	61	**GY4.0500**	110	84	150
2"	38	14	75	**GY4.0630**	230	175	90
2 1/2"	44	17	89	**GY4.0750**	300	228	50
3"	51	20	106	**GY4.0900**	420	319	25
4"	61	24	129	**GY4.1100**	835	635	16
5"	76	31	163	**GY4.1400**	1620	1231	6
6"	86	35	186	**GY4.1600**	2265	1721	5
8"	116	65	259	**GY4.2250**	7250	5620	-
10"	140	66	307	**GY4.2800**	9800	N/A	-
12"	165	78	363	**GY4.3150**	15500	N/A	-



SOCKET PLAIN

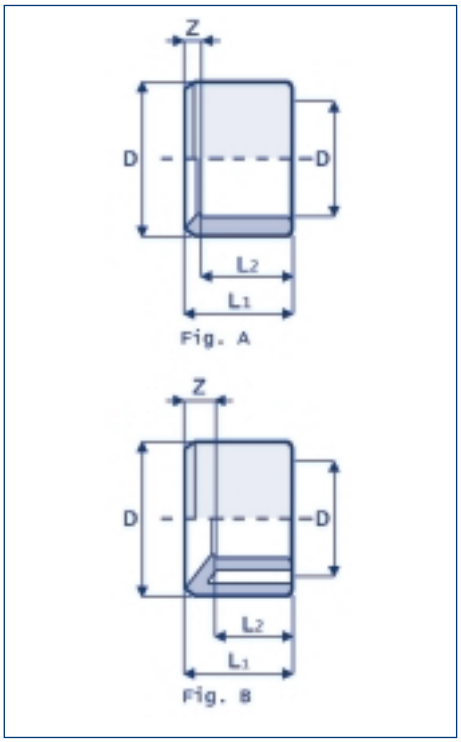
MA4

Nom Dia.	L	Z	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	3	28	**MA4.0200**	15	11	900
3/4"	19	3	34	**MA4.0250**	20	15	500
1"	22	3	42	**MA4.0320**	30	23	300
1 1/4"	26	3	51	**MA4.0400**	60	46	150
1 1/2"	31	3	61	**MA4.0500**	85	65	100
2"	38	3	75	**MA4.0630**	140	106	50
2 1/2"	44	4	89	**MA4.0750**	215	163	70
3"	51	5	106	**MA4.0900**	355	270	40
4"	61	6	129	**MA4.1100**	605	460	25
5"	76	8	162	**MA4.1400**	1230	935	10
6"	86	8	182	**MA4.1600**	1380	1049	6
8"	115	12	195	**MA4.2250**	4950	-	-
8"	119	11	257	**MA4.2250**	-	3668	-
10"	140	10	308	**MA4.2800**	5800	N/A	-
12"	165	13	362	**MA4.3150**	9800	N/A	-



RC4

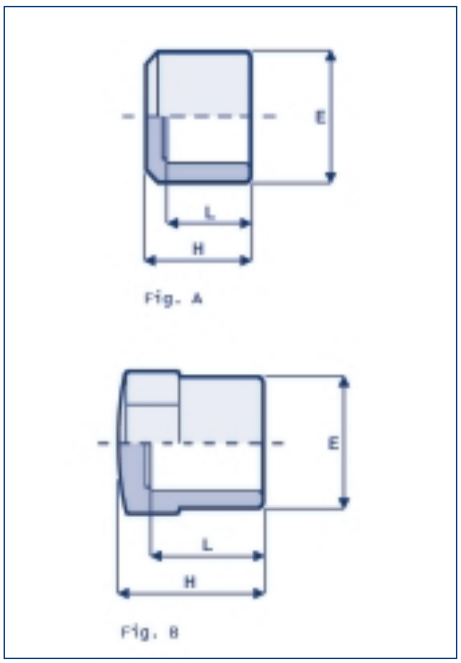
REDUCING BUSH PLAIN



Nom Dia. DxD	L_1	L_2	Z	Fig.	Code	PVC-U gms	ABS gms	Box
3/4 x 1/2"	19	16	3	A	**RC4.025B**	5	4	2200
1 x 1/2"	22	16	6	B	**RC4.032B**	18	14	1100
1 x 3/4"	22	19	3	A	**RC4.032B**	10	8	1100
1 1/4 x 1"	26	22	4	A	**RC4.040D**	15	11	600
1 1/2 x 3/4"	31	19	12	B	**RC4.050C**	45	34	300
1 1/2 x 1"	31	22	9	B	**RC4.050D**	44	33	300
1 1/2 x 1 1/4"	31	26	5	A	**RC4.050E**	35	27	300
2 x 1"	38	22	16	B	**RC4.063D**	80	61	150
2 x 1 1/4"	38	26	12	B	**RC4.063E**	80	61	150
2 x 1 1/2"	38	31	7	A	**RC4.063F**	65	49	150
2 1/2 x 2"	44	38	6	A	**RC4.075G**	85	65	100
3 x 1 1/2"	51	31	20	B	**RC4.090F**	220	167	60
3 x 2"	51	38	13	B	**RC4.090G**	205	156	60
3 x 2 1/2"	51	44	7	A	**RC4.090H**	150	114	60
4 x 2"	61	38	23	B	**RC4.110G**	375	285	30
4 x 3"	61	51	17	A	**RC4.110I**	280	213	30
5 x 4"	76	61	15	B	**RC4.140L**	460	350	30
6 x 4"	86	61	25	B	**RC4.160L**	795	604	20
8 x 6"	115	90	25	A	**RC4.225O**	1400	-	-
8 x 6"	110	87	23	A	**RC4.225O**	-	1185	-
10 x 8"	140	115	25	A	**RC4.280R**	3500	N/A	-
12 x 10"	165	140	25	A	**RC4.315S**	4100	N/A	-

CA4

CAP PLAIN

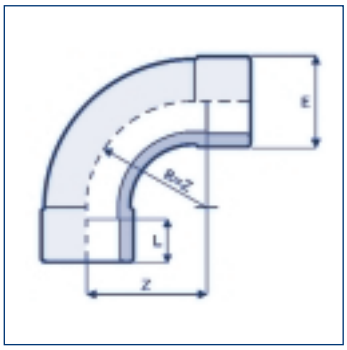


Nom Dia.	L	H	E	Fig.	Code	PVC-U gms	ABS gms	Box
1/2"	16	24	28	A	**CA4.0200**	49	37	1200
3/4"	19	27	34	A	**CA4.0250**	49	37	800
1"	22	30	42	A	**CA4.0320**	33	25	400
1 1/4"	26	35	51	A	**CA4.0400**	50	38	300
1 1/2"	31	40	61	A	**CA4.0500**	70	53	150
2"	38	48	75	A	**CA4.0630**	115	87	95
2 1/2"	44	59	89	B	**CA4.0750**	228	173	50
3"	51	67	106	B	**CA4.0900**	349	265	30
4"	61	77	129	B	**CA4.1100**	530	403	20
5"	76	108	162	A	**CA4.1400**	860	654	20
6"	86	126	181	A	**CA4.1600**	1317	990	-

BEND 90° PLAIN

CU4

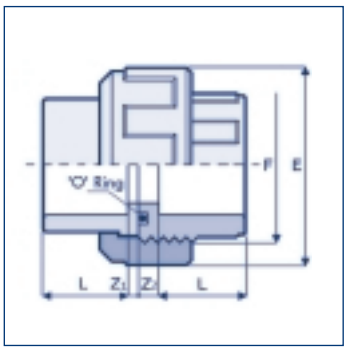
Nom Dia.	L	Z	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	40	28	**CU4.0200**	45	34	300
3/4"	19	50	34	**CU4.0250**	75	57	150
1"	22	64	41	**CU4.0320**	120	91	90
1 1/4"	26	80	51	**CU4.0400**	205	156	100
1 1/2"	31	100	65	**CU4.0500**	310	236	50
2"	38	126	77	**CU4.0630**	510	388	25
2 1/2"	44	150	94	**CU4.0750**	995	756	15
3"	51	180	113	**CU4.0900**	1765	1341	10
4"	61	220	137	**CU4.1100**	2805	2132	5



UNION PLAIN

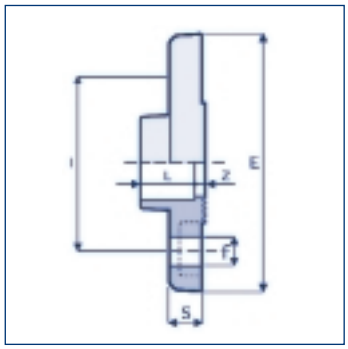
BO4

Nom Dia.	L	Z_1	Z_2	F	E	'O' Ring	Code	PVC-U gms	ABS gms	Box
1/2"	16	3	10	1"	42	4081	**BO4.0200**	42	32	350
3/4"	19	3	10	1/4"	52	4112	**BO4.0250**	70	53	200
1"	22	3	10	1/2"	59	4131	**BO4.0320**	97	74	150
1 1/4"	26	3	12	2"	72	6162	**BO4.0400**	156	119	80
1 1/2"	31	3	14	1/4"	79	6187	**BO4.0500**	216	164	50
2"	38	3	18	3/4"	96	6237	**BO4.0630**	368	280	30
2 1/2"	44	3	20	1/2"	116.6	6312	**BO4.0750**	560	426	15
3"	51	5	20	4"	131	6362	**BO4.0900**	750	570	12
4"	61	5	20	5"	159.4	6450	**BO4.1100**	1300	988	12



FF4

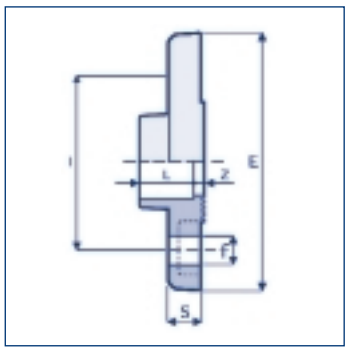
FULL FACE FLANGE DRILLED BS 10 TABLE D AND E



Nom Dia.	L	Z	E	I	f	S	No. Holes	Code	PVC-U gms	ABS gms	Box
1/2"	16	4	95	67	14	11	4	**FF4.0200**	70	53	150
3/4"	19	4	105	73	14	12	4	**FF4.0250**	87	66	120
1"	22	4	115	83	14	14	4	**FF4.0320**	137	104	80
1 1/4"	26	4	140	87	14	15	4	**FF4.0400**	237	180	60
1 1/2"	31	5	150	98	14	16	4	**FF4.0500**	80	213	40
2"	38	5	165	115	18	18	4	**FF40630**	395	300	25
3"	51	7	200	145	18	20	4	**FF4.0900**	780	593	10

FFN

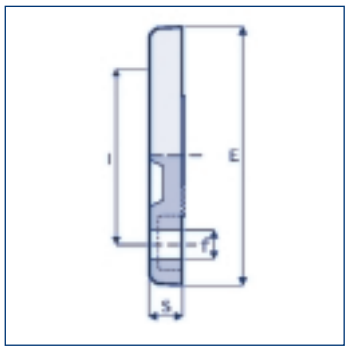
FULL FACE FLANGE DRILLED PN16



Nom Dia.	L	Z	E	I	f	S	No. Holes	Code	PVC-U gms	ABS gms
1/2"	15	4.5	95	65	14	11	4	**FFN.0200**	70	53
3/4"	19	4.5	105	75	14	12	4	**FFN.0250**	105	80
1"	22	4.5	115	85	14	14	4	**FFN.0320**	148	112
1 1/4"	26	4.5	142	100	18	15	4	**FFN.0400**	225	171
1 1/2"	31	4.5	152	110	18	16	4	**FFN.0500**	285	217
2"	38	4.5	165	125	18	18	4	**FFN.0630**	420	319
2 1/2"	44	6	185	145	18	19	4	**FFN.0750**	505	384
3"	51	7	200	160	18	20	8	**FFN.0900**	735	558
4"	61	8	220	180	18	22	8	**FFN.1100**	930	707

FC4E

BLANK FLANGE DRILLED TABLE D AND E

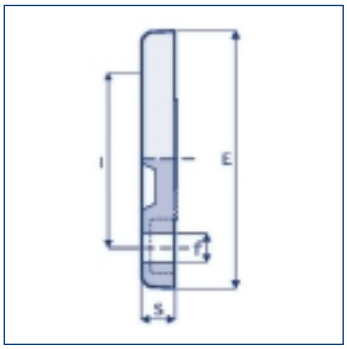


Nom Dia.	E	I	f	S	No. Holes	Code	PVC-U gms	ABS gms	Box
1/2"	95	67	14	11	4	**FC4E.0200**	99	75	250
3/4"	105	73	14	12	4	**FC4E.0250**	106	81	150
1"	115	83	14	14	4	**FC4E.0320**	206	157	120
1 1/2"	150	98	14	16	4	**FC4E.0500**	327	249	70
2"	165	115	18	18	4	**FC4E.0630**	358	272	40
3"	200	145	18	20	4	**FC4E.0900**	570	433	30
4"	220	178	18	22	8	**FC4E.1100**	766	582	20
6"	285	235	22	28	8	**FC4E.1600**	1455	1106	20

BLANK FLANGE DRILLED PN16

FC4N

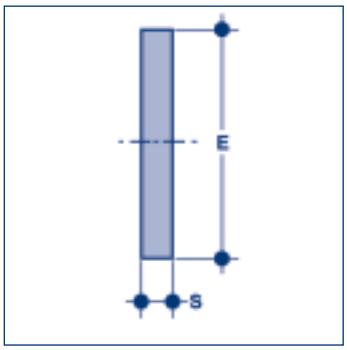
Nom Dia.	E	I	f	S	No. Holes	Code	PVC-U gms	ABS gms	Box
1/2"	95	65	14	11	4	**FC4N.0200**	99	75	250
3/4"	105	75	14	12	4	**FC4N.0250**	106	81	150
1"	115	85	14	14	4	**FC4N.0320**	206	157	120
1 1/2"	150	110	18	16	4	**FC4N.0500**	327	249	70
2"	165	125	18	18	4	**FC4N.0630**	358	272	40
3"	200	160	18	20	8	**FC4N.0900**	570	433	30
4"	220	180	18	22	8	**FC4N.1100**	766	582	20
6"	285	240	22	28	8	**FC4N.1600**	1455	1106	20



BLANK FLANGE UNDRILLED

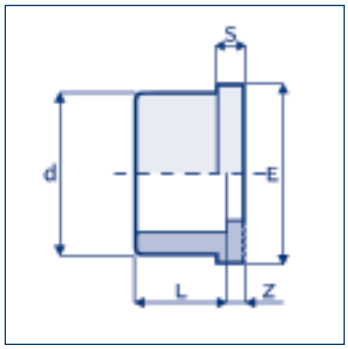
FC4P

Nom Dia.	E	S	Code	PVC-U gms	ABS gms
1/2"	95	13	**FC4P.0200**	120	91
3/4"	105	13	**FC4P.0250**	145	110
1"	115	13	**FC4P.0320**	160	122
1 1/4"	140	13	**FC4P.0400**	205	156
1 1/2"	150	13	**FC4P.0500**	250	190
2"	165	13	**FC4P.0630**	300	220
2 1/2"	185	20	**FC4P.0750**	510	387
3"	200	20	**FC4P.0900**	690	524
4"	220	20	**FC4P.1100**	950	722
6"	250	25	**FC4P.1600**	2100	1596



QR4

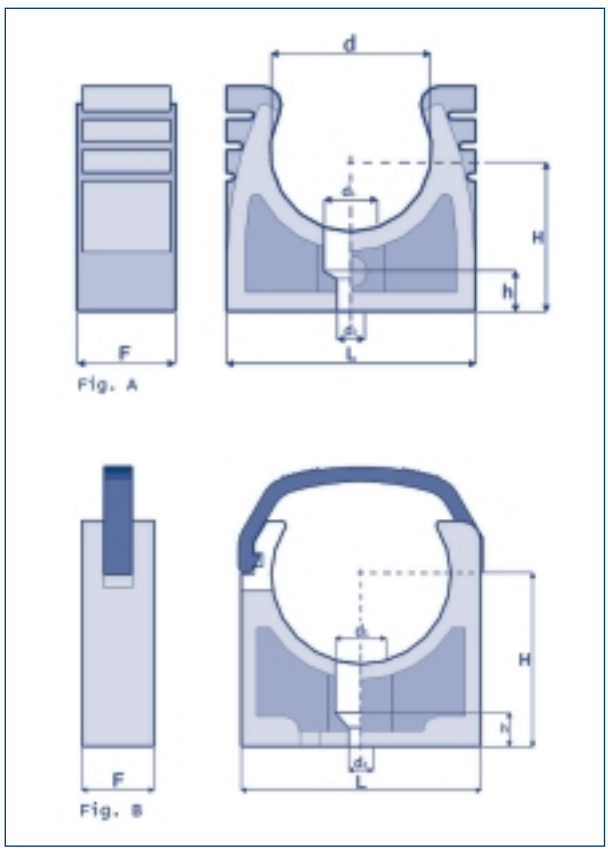
STUB FLANGE SERRATED FACE



	Nom Dia.	L	Z	d	E	S	Code	PVC-U gms	ABS gms	Box
	1/2"	16	3	27	34	6	**QR4.0200**	10	8	1200
	3/4"	19	3	33	41	7	**QR4.0250**	14	11	750
	1"	22	3	41	50	7	**QR4.0320**	33	25	400
	1 1/4"	26	3	50	61	8	**QR4.0400**	37	28	250
	1 1/2"	31	3	61	73	8	**QR4.0500**	60	46	120
	2"	38	3	76	90	9	**QR4.0630**	110	84	80
	2 1/2"	44	3	90	106	10	**QR4.0750**	165	125	50
	3"	51	5	108	125	11	**QR4.0900**	270	205	60
	4"	61	5	131	150	12	**QR4.1100**	445	338	40
PVC-U	5"	76	5	165	188	17	**QR4.1400**	735	-	20
ABS	5"	76	7	171	180	14	**QR4.1400**	-	680	20
	6"	86	5	188	212	16	**QR4.1600**	1250	950	12
PVC-U	8"	116	8	250	270	20	**QR4.2250**	2105	-	6
ABS	8"	118	14	257	269	26	**QR4.2250**	-	2075	6
	10"	147	8	308	326	29	**QR4.2800**	3450	N/A	-
	12"	169	9	362	378	33	**QR4.3150**	5060	N/A	-

ST4

PIPE BRACKET IN PP*



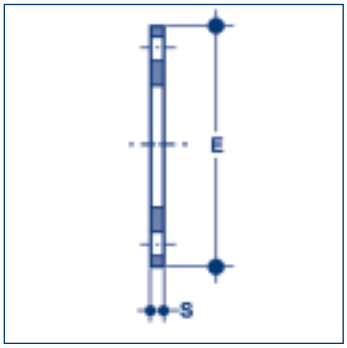
Nom Dia.	H	L	d_2	d_1	h	F	Fig.	Code	gms	Box	Pack
3/8"	22.0	28.0	5.5	10.5	7.5	16.0	A	**ST4.0160**	6	1500	10
1/2"	24.5	33.0	5.5	10.5	7.5	16.0	A	**ST4.0200**	7	1100	10
3/4"	28.2	38.0	5.5	10.5	7.5	16.0	A	**ST4.0250**	9	900	10
1"	31.5	48.0	5.5	10.5	7.5	16.0	A	**ST4.0320**	13	600	10
1 1/4"	41.5	54.0	5.5	10.5	7.5	20.0	B	**ST4.0400**	23	370	10
1 1/2"	46.5	64.5	7.0	14.0	9.0	23.0	B	**ST4.0500**	29	240	10
2"	56.0	80.0	7.0	14.0	9.0	25.0	B	**ST4.0630**	39	280	10
2 1/2"	63.6	94.0	9.0	17.0	10.5	27.5	B	**ST4.0750**	55	240	10
3"	72.0	115.0	9.0	17.0	13.5	30.0	B	**ST4.0900**	85	100	10
4"	81.0	138.5	9.0	17.0	13.5	30.0	B	**ST4.1100**	100	100	10

*** AVAILABLE ALSO IN BLACK PE**

EPDM GASKET - FULL FACE DRILLED BS10 TABLE D OR E

GFE

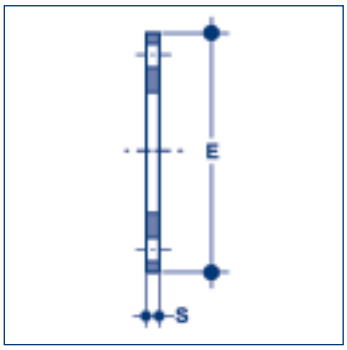
Nom Dia.	E	S	No. Holes	gms	Code
1/2"	95	3	4	30	**GFE.0200**
3/4"	101	3	4	36	**GFE.0250**
1"	114	3	4	35	**GFE.0320**
1 1/4"	120	3	4	40	**GFE.0400**
1 1/2"	135	3	4	55	**GFE.0500**
2"	156	3	4	57	**GFE.0630**
2 1/2"	165	3	4	56	**GFE.0750**
3"	186	3	4	99	**GFE.0900**
4"	219	3	8	114	**GFE.1100**
4"	219	3	4	116	**GFE.110E**
6"	279	3	8	160	**GFE.1600**
8"	340	3	8	162	**GFE.2250**



EPDM GASKET - FULL FACE DRILLED PN10/16

GFN

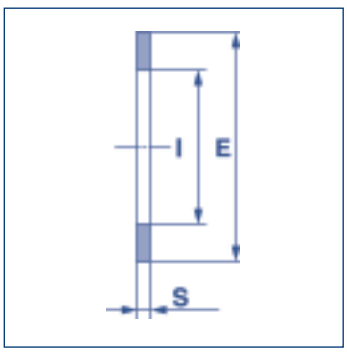
Nom Dia.	E	S	No. Holes	gms	Code
1/2"	95	3	4	30	**GFN.0200**
3/4"	101	3	4	36	**GFN.0250**
1"	114	3	4	35	**GFN.0320**
1 1/4"	120	3	4	40	**GFN.0400**
1 1/2"	135	3	4	55	**GFN.0500**
2"	156	3	4	57	**GFN.0630**
2 1/2"	176	3	4	78	**GFN.0750**
3"	186	3	8	99	**GFN.0900**
4"	219	3	8	114	**GFN.1100**
6"	279	3	8	160	**GFN.1600**
8"	340	3	12	195	**GFN.2250**



EPDM GASKET FOR SERRATED STUB FLANGE (QR4)

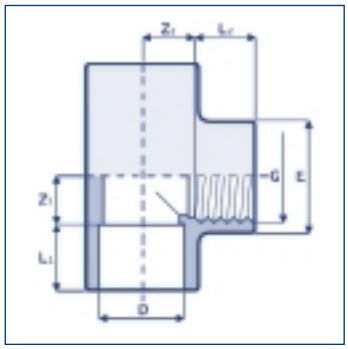
GQP

Nom Dia.	I	E	S	Code
1/2"	20	32	2	**GQP.0200**
3/4"	25	39	2	**GQP.0250**
1"	32	48	2	**GQP.0320**
1 1/4"	40	59	2	**GQP.0400**
1 1/2"	50	71	2	**GQP.0500**
2"	63	88	2	**GQP.0630**
2 1/2"	75	104	2	**GQP.0750**
3"	90	123	2	**GQP.0900**
4"	110	148	3	**GQP.1100**
5"	140	186	3	**GQP.1400**
6"	160	211	3	**GQP.1600**
8"	220	270	3	**GQP.2250**



TI6

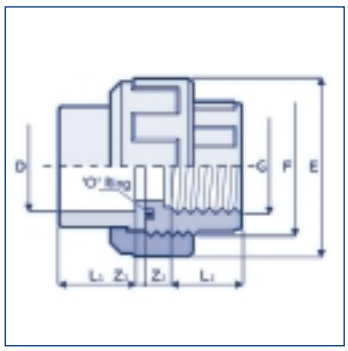
TEE PLAIN/THREADED BRANCH



Nom Dia. D&G	L_1	L_2	Z_1	Z_2	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	15	11	12	28	**TI6.0200**	49	37	400
3/4"	19	16	14	16	34	**TI6.0250**	55	42	220
1"	22	19	17	20	42	**TI6.0320**	75	57	130
1 1/4"	26	21	21	25	51	**TI6.0400**	125	95	70
1 1/2"	31	21	26	35	61	**TI6.0500**	200	152	90
2"	38	25	33	45	75	**TI6.0630**	380	289	45
2 1/2"	44	30	39	52	89	**TI6.0750**	530	403	30
3"	51	33	47	64	106	**TI6.0900**	845	642	18

BO6

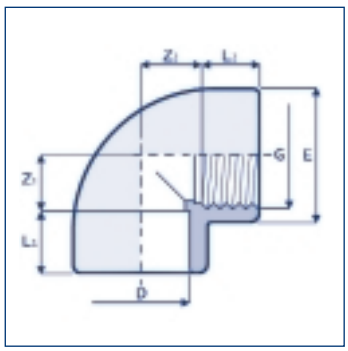
UNION PLAIN/THREADED



Nom Dia. D&G	L_1	L_2	Z_1	Z_2	F	E	'O' Ring	Code	PVC-U gms	ABS gms	Box
1/2"	16	15	3	11.0	1"	42	4081	**BO6.0200**	42	32	350
3/4"	19	16	3	12.7	1 1/4"	52	4112	**BO6.0250**	70	53	200
1"	22	19	3	12.9	1 1/2"	59	4131	**BO6.0320**	96	73	150
1 1/4"	26	21	3	16.6	2"	72	6162	**BO6.0400**	155	118	80
1 1/2"	31	21	3	23.6	2 1/4"	79	6187	**BO6.0500**	237	180	50
2"	38	25	3	30.3	2 3/4"	96	6237	**BO6.0630**	405	308	30

GO6

ELBOW 90° PLAIN/THREADED

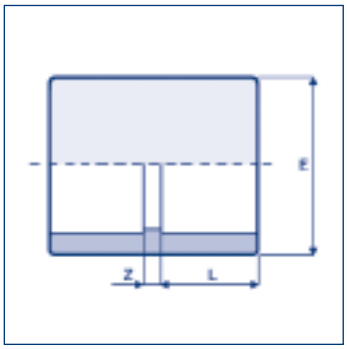


Nom Dia. D&G	L_1	L_2	Z_1	Z_2	E	Code	PVC-U gms	ABS gms	Box
1/2"	16	15	11	12	28	**GO6.0200**	25	19	600
3/4"	19	16	14	16	34	**GO6.0250**	38	29	350
1"	22	19	17	20	42	**GO6.0320**	60	46	200
1 1/4"	26	21	21	25	51	**GO6.0400**	95	72	100
1 1/2"	31	21	26	35	61	**GO6.0500**	165	125	60
2"	38	25	33	45	75	**GO6.0630**	280	213	60
2 1/2"	44	30	39	53	89	**GO6.0750**	417	317	40
3"	51	33	47	65	106	**GO6.0900**	690	524	25

INCH/METRIC SOCKET PLAIN

MA5

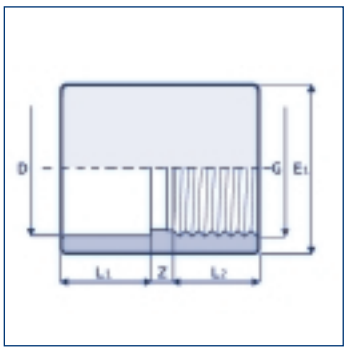
Diameter	L	Z	E	Code	PVC-U gms	Box
1/2" x 20	16	3	28	**MA5.0200**	15	900
3/4" x 25	19	3	34	**MA5.0250**	20	500
1" x 32	22	3	42	**MA5.0320**	30	300
1 1/4" x 40	26	3	51	**MA5.0400**	60	150
1 1/2" x 50	31	3	61	**MA5.0500**	85	100
2" x 63	38	3	75	**MA5.0630**	140	50
3" x 90	51	5	106	**MA5.0900**	355	40
4" x 110	61	6	129	**MA5.1100**	605	25



SOCKET PLAIN/THREADED

MA6

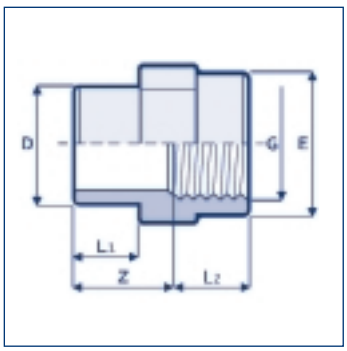
Nom Dia. D&G	L_1	L_2	Z	E_1	Code	PVC-U gms	ABS gms	Box
1/2"	16	15	4	28	**MA6.0200**	15	11	900
3/4"	19	16	6	34	**MA6.0250**	25	19	500
1"	22	19	6	42	**MA6.0320**	40	30	300
1 1/4"	26	21	8	51	**MA6.0400**	60	46	150
1 1/2"	31	21	13	61	**MA6.0500**	100	76	100
2"	38	25	15	75	**MA6.0630**	180	137	50
2 1/2"	44	30	8	89	**MA6.0750**	225	171	70
3"	51	33	9	106	**MA6.0900**	355	270	40
4"	61	39	10	129	**MA6.1100**	555	422	25



ADAPTOR MALE PLAIN/FEMALE THREADED

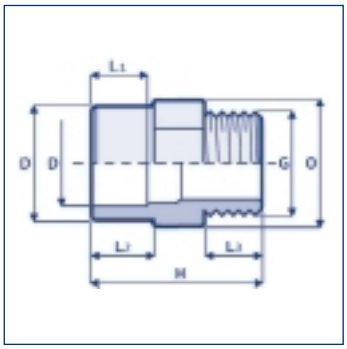
AF6

Nom Dia. D&G	L_1	L_2	E	Z	Code	PVC-U gms	ABS gms	Box
1/2"	16	15.0	28	22	**AF6.0200**	20	15	800
3/4"	19	16.3	34	29	**AF6.0250**	30	23	500
1"	22	19.1	42	32	**AF6.0320**	40	30	300
1 1/4"	26	21.4	51	37	**AF6.0400**	76	58	150
1 1/2"	31	21.4	58	42	**AF6.0500**	100	76	100
2"	38	25.7	72	50	**AF6.0630**	140	106	60



AM6

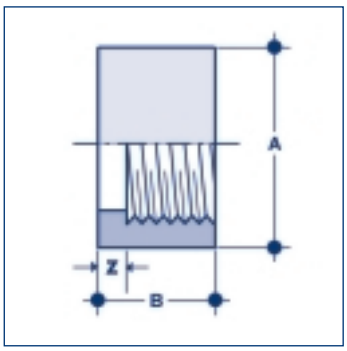
ADAPTOR FEMALE PLAIN/MALE THREADED



Nom Dia. DxDxG	L_1	L_2	L_3	H	O	Code	PVC-U gms	ABS gms	Box
1/2" x 3/4" x 1/2"	16	19	15.0	46	30	**AM6.0200**	15	11	800
3/4" x 1" x 3/4"	19	22	16.3	50	36	**AM6.0250**	25	19	400
1" x 3/4" x 1"	22	26	19.1	57	46	**AM6.0320**	40	30	250
1 1/4" x 1" x 1 1/4"	26	31	21.4	67	55	**AM6.0400**	70	53	130
1 1/2" x 1 1/4" x 1 1/2"	31	38	21.4	74	65	**AM6.0500**	115	87	80
2" x 1 1/2" x 2"	38	44	25.7	84	80	**AM6.0630**	160	122	60
2 1/2" x 2" x 2 1/2"	44	51	30.2	99	95	**AM6.0750**	285	217	45
3" x 2 1/2" x 3"	51	61	33.3	113	115	**AM6.0900**	490	372	20
4" x 3" x 4"	61	68	39.3	120	130	**AM6.1100**	490	372	30

RC6

REDUCING BUSH PLAIN/THREADED

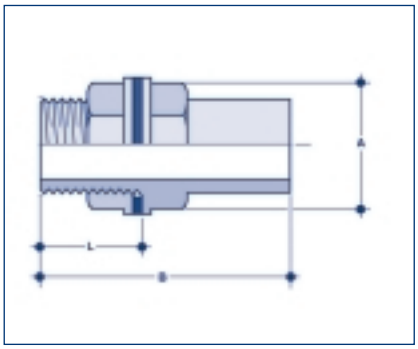


Nom Dia.	B	Z	A	Code	PVC-U gms	ABS gms
1/2" x 3/8"	16	6	21.4	**RC6.020A**	5	4
3/4" x 1/2"	20	5	26.5	**RC6.025B**	9	7
1" x 3/4"	25	6	33.6	**RC6.032C**	15	12

TANK CONNECTOR PLAIN/THREADED

TC6

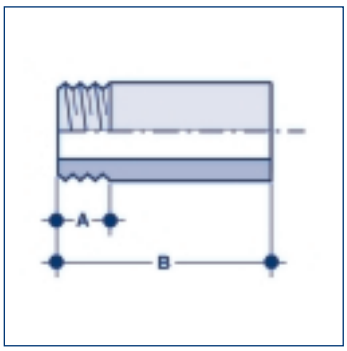
Nom Dia.	L	B	A	Code	PVC-U gms	ABS gms
1/2"	42	76	28	**TC6.0200**	34	26
3/4"	42	76	33	**TC6.0250**	39	30
1"	55	101	46	**TC6.0320**	110	80
1 1/4"	70	120	50	**TC6.0400**	154	120
1 1/2"	73	127	60	**TC6.0500**	207	170
2"	85	152	79	**TC6.0630**	358	325
2 1/2"	94	164	90	**TC6.0750**	471	430
3"	112	202	105	**TC6.0900**	656	700
4"	130	230	135	**TC6.1100**	1345	1225



BARREL NIPPLE PLAIN/THREADED

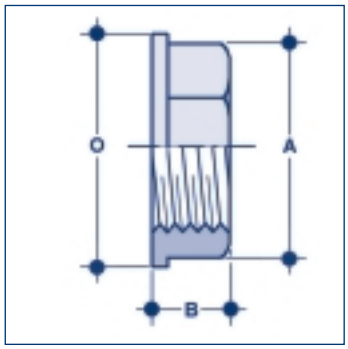
BN6

Nom Dia.	A	B	Code	PVC-U gms	ABS gms
3/8"	13	42	**BN6.0160**	10	5
1/2"	16	49	**BN6.0200**	15	10
3/4"	18	55	**BN6.0250**	20	15
1"	21	62	**BN6.0320**	35	25
1 1/4"	23	72	**BN6.0400**	60	45
1 1/2"	30	87	**BN6.0500**	45	70
2"	30	87	**BN6.0630**	115	105
2 1/2"	35	106	**BN6.0750**	180	120
3"	38	127	**BN6.0900**	300	252
4"	40	150	**BN6.1100**	560	525



NU2

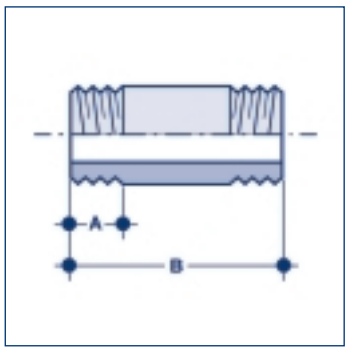
BACK NUT THREADED



Nom Dia. BSP	A	B	O	Code	PVC-U gms	ABS gms	Box
1/2"	29	13	37	**NU2.0200**	10	10	1500
3/4"	33	14	43	**NU2.0250**	10	10	1200
1"	46	16	56	**NU2.0320**	25	20	610
1 1/4"	50	18	59	**NU2.0400**	30	20	400
1 1/2"	60	19	70	**NU2.0500**	40	30	320
2"	79	21	92	**NU2.0630**	80	65	156
2 1/2"	95	23	105	**NU2.0750**	105	85	120
3"	110	27	125	**NU2.0900**	165	130	120
4"	139	30	152	**NU2.1100**	260	205	56

BA2

BARREL NIPPLES THREADED



Nom Dia. BSPT	A	B	Code	PVC-U gms	ABS gms
1/2"	16	49	**BA2.0200**	15	10
3/4"	18	55	**BA2.0250**	20	15
1"	21	62	**BA2.0320**	35	25
1 1/4"	23	72	**BA2.0400**	55	40
1 1/2"	30	87	**BA2.0500**	75	60
2"	30	87	**BA2.0630**	105	95
2 1/2"	30	105	**BA2.0750**	169	157
3"	38	127	**BA2.0900**	250	245
4"	40	150	**BA2.1100**	500	490

Notes

Notes

CATALOGUE

PVC-U AND ABS

IMPERIAL

PIPES AND FITTINGS

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