Ductile Iron Pipe, Fittings & Accessories

Product Catalogue

iPLEX Pipelines

Disclaimer

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1.0 Introduction

Ductile iron pipe

Since its introduction to Australia in the 1950's ductile iron pipe has been recognised as an industry standard for water and wastewater systems. More than five decades of field experience have proven its strength, durability and reliability for water and wastewater applications.

Designed and manufactured to the industry's most stringent standards, Irontite® ductile iron pipe and Crevet® ductile iron fittings are suitable for the most arduous of conditions when handled and installed in accordance with industry recommendations and once installed can tolerate some of the most demanding operating conditions, including water hammer, deep trenching, shallow trenching with traffic loading and unstable soil conditions.

Irontite® pipe is generally manufactured in standard 5.7 metre effective lengths (may also be supplied in 6m) in diameters ranging from DN100 to DN750 in pressure class PN35. Flanged pipe is also available in PN16 and PN35 on request.

The Irontite® ductile iron pipe range is supplied with cement mortar lining, including a bituminous seal coating for sizes DN100 to DN300, to maintain water quality in pipelines with low rates of flow.

All Irontite® pipes are supplied with a corrosion resistant protective coating of metallic zinc. This coating is applied to the external surface of the pipe and has the potential to significantly extend the service life of the pipeline in certain soil types and conditions. This anodic coating, although not required by the Australian standard, is a key element of EN and ISO ductile iron pipe standards and has been relied upon for many years where these Standards are used, including Europe, the UK and Asia. All pipes are in addition externally coated with a 2-part epoxy resin paint that extends into the pipe sockets as far as the cement mortar lining.

History of ductile iron pipe

The strength and durability of ductile's predecessor, grey cast iron pipe is widely recognized. The first offical record of a Grey Iron pipe installation was in 1455 in Germany. In 1664, the French King Louis XIV ordered the construction of a grey iron pipe main extending 24 kilometres from a pumping station at Marly-on-Seine to Versailles to supply water to the fountains and town. This pipe served the palace gardens for more than 340 years.

Grey iron pipe was introduced to the United States as early as 1817. Today, more than 611 U.S. utilities have had grey iron distribution mains in continuous service for more than 100 years.

Even stronger and tougher than grey iron

Ductile iron retains all of grey cast iron's attractive qualities, coupled with toughness, and ductility. Although its chemical properties are similar to those of grey iron, ductile iron incorporates significant casting refinements, additional metallurgical processes, and superior quality control.

The microstructure of ductile iron differs from grey iron. In ductile iron, the graphite is in the form of spherical nodules rather than flakes (as found in grey iron), thus inhibiting the propagation of cracks and providing the enhanced ductility that gives the alloy its name. The formation of nodules is achieved by the addition of nodulizers, usually magnesium, to molten iron of appropriate composition during manufacture. Due to its spherical graphite form, Ductile iron has approximately twice the strength of grey iron as determined by tensile, beam, ring bending, and bursting tests. Its impact strength and elongation are many times greater than grey iron's.

Comparison of metal characteristics of grey iron and ductile iron

Ductile iron **Grey iron**

As these photomicrographs show, ductile iron (left) differs from grey iron (right) in that it's graphite is spheroidal, or nodular, instread of the flake form found in grey iron. Ductile iron's greater strength, ductility, and toughness are due to this change in microstructure.

Ductile iron fittings

Ductile iron fittings for use with ductile iron, PVC and GRP pressure pipe are manufactured and tested in accordance with Australian Standard AS/NZS 2280 "Ductile iron pipes and fittings".

This standard range of ductile iron fittings incorporates all fittings required for normal water supply systems in sizes DN80 to DN750 with socket, spigot and flanged joints.

Socketed ductile iron fittings are available with either,

- Griptite® sockets for Series 2 pipe sizes
- Nortite® sockets for Series 1 pipe sizes
- Standard sockets for Series 2 and Series 1 pipe sizes with adaptor seals

Spigoted ductile fittings are compatible with ductile iron sockets of the same nominal size. Ductile iron spigots shall not be used with PVC or GRP pipe sockets.

Flanges used with ductile iron fittings are normally for water supply and plant work. The pressure ratings for ductile flanges are shown for each table as either PN16 or PN35 to AS/NZS 4087 "Metallic flanges for water works purposes".

It should be noted that although ductile iron flanges were in the past, always full faced, it is now common practice for ductile iron flanges to be raised face. Steel and GRP flanges are normally plain faced and should not be directly mated with a ductile iron raised face unless a spacer flange is used.

Ductile iron fittings are supplied with a polymeric coating to AS/NZS 4158 and do not require additional corrosion protection in natually occuring soils. Where fittings are supplied with bitumen coating polyethylene sleeving with adhesive wrapping tape should be specified.

A range of ductile iron fittings, valves and accessories are available allowing a complete pipeline system.

1.1 Advantages

Throughout Australia and New Zealand, Irontite® ductile iron pipes and Crevet® ductile iron fittings have been chosen for their:

High strength

Ductile iron provides a pipe with high hoop and axial strength. Irontite® pipe can withstand severe stresses caused by heavy external soil, traffic, groundwater and construction loads and internally by operating and high transient pressures.

High beam strength

Ductile iron is recognized for its capacity to withstand beam loads in above ground installations.

Corrosion resistance

Irontite® ductile iron pipe is manufactured with 200g/m^2 external metallic zinc and 2-part epoxy coatings providing increased corrosion protection. Polyethylene sleeving may be applied during installation for further enhanced protection in aggressive environments. Some specialist applications may require a higher level of corrosion protection such as polyurethane and or heavier zinc aluminium metallic coatings. For further information and availability contact Iplex Pipelines.

Crevet ductile iron fittings are supplied with a thermal-bonded polymeric coating for high resistance to corrosion and do not require polyethylene sleeving for protection.

High impact resistance

Whilst care should always be taken to minimize the possibility of damage, Irontite's® high toughness means it is able to withstand the rigors of on-site handling in difficult terrain and abnormal service conditions.

Ductile iron fittings and accessories

A complete range of fittings and accessories are available allowing flexibility in design and construction. For further information refer to the product range in this catalogue.

Crevet SL® ductile iron fittings

Crevet SL® provides a range of light-weight ductile iron fittings for easier handling and installation, increasing laying efficiency, reduction of carbon footprint and reducing the potential risks associated with occupational health and safety requirements.

Flow characteristics

Irontite's® relatively low coefficient of friction (Colebrook White roughness coefficient k = 0.03mm) can result in high flow capacity, low head loss, low pumping costs, and significant energy savings over the life of the pipeline.

Maintenance free

Years of experience in operating systems throughout the world have demonstrated that, once installed, zinc coated ductile iron pipes and polymeric coated fittings require little, if any, maintenance over the life of the pipeline when installed in accordance with the manufacturer's recommendations. Ductile iron's longevity can be witnessed in the outstanding service records of grey iron pipe over the past 150 years.

Tremendous burst strength

Irontite's® tremendous burst strength makes it ideally suited for high-pressure applications and also provides an additional safety factor against water hammer.

Ease of installation

Irontite® is generally available in 5.7 metre effective lengths (may also be supplied in 6m) reducing the number of joints during installation when compared with 5.5 metre effective lengths. This improves laying efficiencies and reduces installation costs.

Jointing

Irontite® ductile iron pipe is available with a spigot x socket rubber ring joint for ease of assembly and jointing, saving time and money. Flanged joint configurations are also available for joining to other pipe materials and above ground applications.

1.2 Applications

Irontite® ductile iron pipes and Crevet® ductile iron fittings are suitable for a range of applications including:

- Potable water
- Raw water
- Irrigation
- Pressure sewage
- Effluent
- Bore water

2.0 Material Properties

The Iplex Irontite® ductile iron pipeline system has all the qualities of its antecedent grey iron, but none of its disadvantages. Ductile iron is noted for its high tensile strength, impact resistance, high yield point and considerable elongation.

Physical Properties of Irontite® ductile iron pipes and Crevet® ductile iron fittings

Property	Description / Value	Relevant standard / reference
Density	7100 kg/m^3	ISO 1083
Tensile strength (minimum)	420 N/mm^2 - Pipe, 400N/mm^2 - Fittings	AS/NZS 2280 (AS 1391 Appendix C)
Elongation (minimum)	DN100 to DN750 10% - Pipe & 12% - Fittings	AS/NZS 2280 (AS 1391 Appendix C)
Ring bending modulus (minimum)	165,000 N/mm^2	AS/NZS 2566.1
Modulus of Elasticity	170,000 N/mm^2	ISO 2531
Hardness (maximum)	230 HB - Pipe and 250HB - Fittings	AS 1816.1 and AS/NZS 2280 Appendix C
Poisson's ratio	0.30	AS/NZS 2566.1
Thermal coefficent of linear expansion ductile iron	12.5 x 10^{-6} m/m/°C	ISO 1083
Thermal coefficent of linear expansioncement mortar lining	12 x 10^{-6} m/m/°C	ISO 4179

2.1 Ductile pipe and fittings standards

Irontite® pipes and fittings are manufactured in accordance with the following Australian and ISO Standards where applicable.

AS 1646 "Rubber joint rings for water supply, sewerage and drainage purposes"

AS 1831 "Spheroidal or nodular graphite iron castings"

AS/NZS 2280 "Ductile iron pipes and fittings"

AS/NZS 2638 "Gate valves for waterworks purposes Part 1: Metal seated"

AS/NZS 2638.2 "Gate valves for waterworks purposes Part 2: Resilient seated"

AS 2758.1 "Aggregates and rock for engineering purposes – concrete aggregate"

AS 3680 "Polyethylene sleeving for ductile iron pipelines"

AS 3681 "Guidelines for the application of polyethylene sleeving to ductile iron pipelines and fittings"

AS/NZS 3750.13 "Paints for steel structures - epoxy primer (Two pack)"

AS 3972 "Portland and blended cement"

AS/NZS 4020 "Testing of products for use in contact with drinking water"

AS/NZS 4087 "Metallic flanges for waterworks purpose"

AS/NZS 4158 "Thermal bonded polymeric coatings on valves and fittings"

AS/NZS 4181 "Stainless steel clamps for waterworks purposes"

ISO 16132 "Ductile iron pipes and fittings, seal coats for cement mortar linings"

AS/NZS 2280 specifies requirements for ductile iron pressure pipes centrifugally cast and ductile fittings of nominal sizes up to and including DN750. This standard also specifies classifications of pipe on the basis of the allowable operating pressure (AOP). Flange class pipe is also specified for the manufacture of flanged pipe with screw-on flanges.

Effect on portable water

Irontite® dutile iron pipes and Crevet® dutile ironfittings have been tested and comply with the requirements of AS/NZS 4020 - 'Testing of products for use in contact with drinking water.'

Irontite® ductile iron pipe centrifugally cast in machine with water cooled steel moulds

Quality

Irontite® pipes and ductile iron fittings have Standards Mark certification to AS/NZS 2280 - "Ductile iron pipes and fittings" for sizes DN100 to DN750 LIC SMK0950/1 and fittings SMK0950.

Irontite® pipes and Crevet® ductile iron fittings are manufactured under third party accredited quality assurance programs complying with AS/NZS ISO 9001 "Quality management systems – Requirements" and WSAA Product Appraisal Report PA 10/08 Part 1.

Quality System™ Quality Endorsed Company

Certified Product™ Australian Standard

2.2 Classifications

Irontite® pipes, Crevet® fittings and flanged pipes are classified by their 'PN' number except for 'Flange Class' pipe. The following provides a description for each classicification.

Irontite® Pipe classifications

The pipe classification for Irontite® is based on its allowable operating pressure in bars (1 bar = 0.1MPa) and is designated by a PN number. The standard classification (pressure class) for Irontite® DI is PN35.

The allowable operating pressure (AOP) is the PN number divided by 10 in Megapascals. A class PN35 Irontite® pipe has therefore an allowable operating pressure of 3.5MPa (35/10).

The class of the pipe is related to the wall thickness and is determined from the following equation, which is derived from Barlow's equation, i.e., $\sigma = PD/2a$

$$a = P_a K_a y / (2R + P_a K_a) \quad \text{..... Equation 1}$$

and shall not be < 3.0mm

Where

a is the minimum wall thickness in mm

Pa is the allowable operating pressure. Excluding surge in MPa

Ka is the safety factor for the allowable operating pressure (=3)

y is the mean pipe barrel outside diameter in mm

R is the minimum ultimate tensile strength of the material in MPa

Pipe wall thicknesses for pressure classification PN35 are given in the Table 8. A special pipe classification, 'Flange Class' for the manufacture of flanged pipe with screw-on flanges is also included.

Flanged pipe classicification

Flange class pipes with screw on flanges are classified by the 'PN' number of the flange. The PN number of the pipe is at least equivalent to the PN number of the flange. Pipe wall thicknesses for 'Flange Class' used for the manufacture of flanged pipe with screw on flanges is included in Irontite® pipe dimensions table on page 5. Further details can also be obtained from AS/NZS 2280.

Crevet® ductile iron fittings classification

Crevet® ductile iron fittings are classified by their 'PN' number based on the allowable operating pressure.

The pressure classification is PN16 and PN35 for standard pressure ductile iron fittings, depending on the end configurations.

Crevet SL® lightweight fittings are classified as either PN16 or PN20 depending on fitting type and end configurations.

For each fittings classification, refer to the Product range section of this manual.

2.3 Allowable working pressure for ductile pipes and fittings

The allowable pressures withing a pipeline system are limited to the lowest pressure classification of all pipe, fittings and appurtenances within the system. Allowable pipeline pressures for class PN35 Irontite's® pipe with elastomeric seal joints, PN16 or PN35 flanged joints and PN16, PN20 (light-weight) and PN35 ductile iron fittings are shown in the table below.

PN	Allowable operating pressure (AOP[1]) MPa	Maximum allowable operating pressure (MAOP[2]) MPa	Allowable site test pressure (ASTP[3]) MPa
16	1.6	1.92	2
20	2.0	2.4	2.5
35	3.5	4.2	4.38

[1] The allowable internal pressure, excluding surge, which a component can safety withstand in service. (AOP) = PN ÷ 10 in MPa

[2] The maximum internal pressure, including surge, which a component can safely withstand in service. (MAOP) = AOP x 1.2 in MPa

[3] The maximum pressure applied on site in a newly installed pipeline, including a safety factor and allowance for surge. (ASTP) = 1.25 x (AOP) in MPa

2.4 Pipe Dimensions

Irontite® PN35 cement lined pipes (Spigot x Socket)

DN	Approximate pipe mass excluding socket (kg/m)	Approximate pipe mass including socket (kg/Length)	Effective length[1] (m)	Overall length (m)	Permissible joint deflection[2]
			Le	Lo	degrees°
100	17	111	5.7	5.79	up to 5
150	25	175	5.7	5.79	up to 5
200	33	229	5.7	5.82	up to 5
225	39	241	5.7	5.82	up to 4
250	45	304	5.7	5.82	up to 4
300	60	400	5.7	5.82	up to 4
375	83	590	5.7	5.83	up to 4
450	111	780	5.7	5.83	up to 2
500	131	828	5.7	5.83	up to 2
600	175	1089	5.7	5.83	up to 2
750	257	1620	5.7	5.85	up to 2

[1] *Irontite® DI Spigot x Socket pipes are manufactured with an effective laying length of 5.7m and a tolerance of +/- 30mm.*

[2] *Refer to Angular deflection.*

Irontite® pipe dimensions

Nominal diameter DN	PN35		Flange class		Mean outside diameter (y)	Allowable ovality
	Nominal wall thickness (t) mm	Minimum wall thickness (a) mm	Nominal wall thickness (t) mm	Minimum wall thickness (a) mm	mm	mm
100	5.0	3.0	7.0	6.0	122 +1, -2	4
150	5.0	3.0	8.0	6.0	177 +1, -2	5
200	5.0	3.0	8.0	7.0	232 +1, -2	7
225	5.2	3.2	9.0	7.0	259 +1, -2	8
250	5.6	3.6	9.0	8.0	286 +1, -2	9
300	6.3	4.3	10.0	8.0	345 +1, -2	10
375	7.3	5.3	10.0	9.0	426 ± 2	12
450	8.3	6.3	11.0	10.0	507 ± 2	15
500	9.0	7.0	12.0	10.0	560 ± 2	15
600	10.3	8.3	13.0	11.0	667 ± 2	15
750	12.2	10.2	15.0	13.0	826 ± 2	15

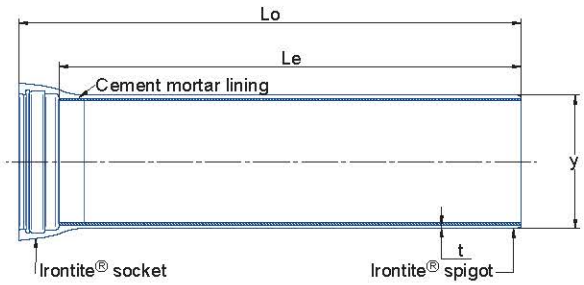
Note:

1. Ovality is the difference between the major and minor axes of the cross section.

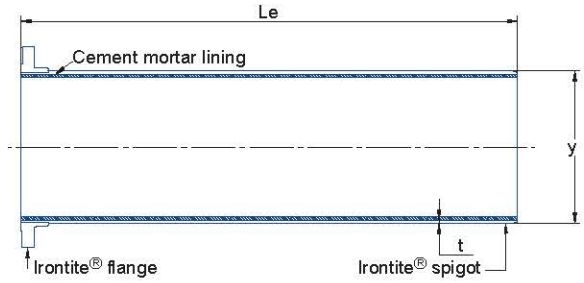
2. Nominal wall thickness (t) = a + 2.0mm.

3. Refer to clause 1.6.4 of AS/NZS 2280 for class of flanged pipe.

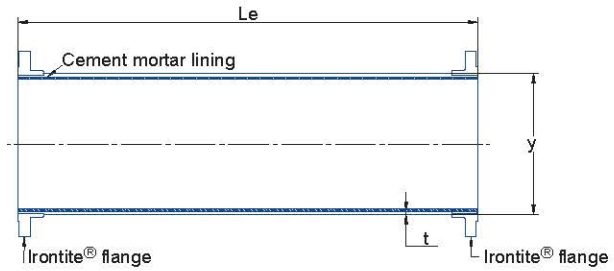
PN35 Irontite® DI pipe spigot x socket



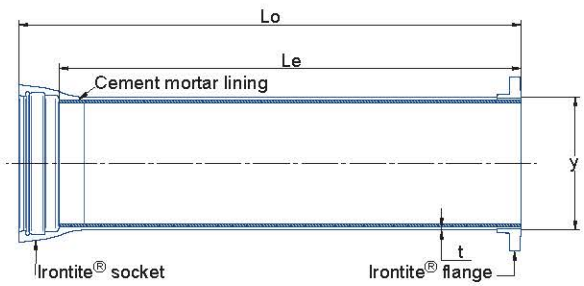
Flange class Irontite® pipe with flange x spigot ends



Flange class Irontite® pipe with flange x flange ends



Flange class Irontite® pipe with flange x socket ends



2.5 Standard coatings

Irontite® pipe coating

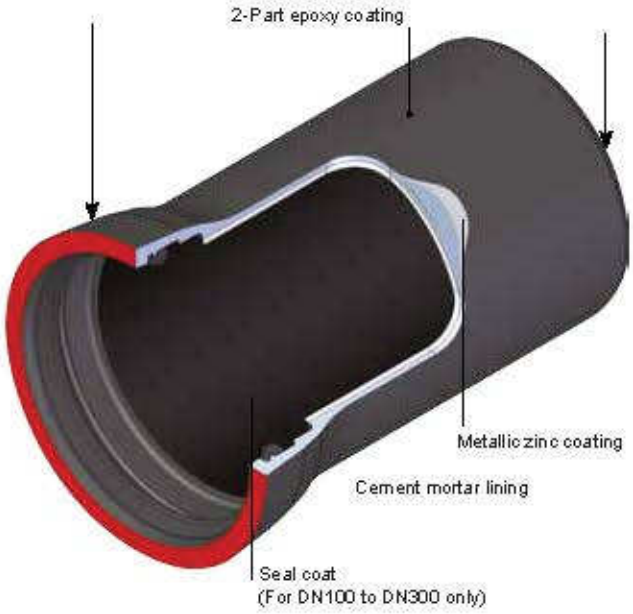
The standard external coating is 200-g/m² metallic zinc applied as a porous substrate layer for Irontite® ductile iron pipe with a 2-part epoxy pore-sealing layer. The zinc coating is not in direct contact with drinking water.

This coating constitutes the standard protection for Irontite® ductile iron pipes.

If the painted surface is damaged, the underlying zinc coating forms a protective layer of insoluble salts to protect pipe against rust in corrosive soils.

The metallic zinc coating complies with ISO 8179.

Cross section of Irontite® pipe socket with external coating



Irontite® pipe lining

The standard internal protection for Irontite® pipes consists of a cement mortar lining. This lining provides effective protection against corrosion and excellent hydraulic performance. The cement lining is applied by a centrifugal process, where the mortar is introduced into the pipe and rotated at high speed, giving the lining a high degree of compaction.

The cement mortar lining is not merely a barrier protection system. It provides active protection for the iron shell by providing chemical protection through the phenomenon of passivity. When the pipe is filled, the mortar gradually absorb water, which becomes highly alkaline when it reaches the proximity of the metal wall rendering it non-corrosive.

A seal coating is also applied for the smaller sizes DN100 to DN300 where the residence time of water in the pipeline is long. Seal coatings reduce the free flow of water into cement mortar linings and this may affect pressure test results. Water Services Association of Australia document WSA03, details a pre pressurisation process that must be adopted for pressure testing of the seal coated Irontite® pipelines.

The roughness coefficient 'K' (Colebrook White) of a new, clean pipeline (neglecting bends, fittings and appurtenances) is 0.03mm.

The linear coefficient of thermal expansion of cement mortar linings is approximately 12 x 10^{-6} m/m/°C, a value practically identical to ductile iron 12.5 x 10^{-6} m/m/°C thus eliminating the risk of crack formation through differential thermal expansion.

Irontite® ductile iron pipes are cement mortar lined in accordance with AS/NZS 2280 and the cement complies with AS 3972. Seal coats, where applied, comply with ISO 16132.

The cement mortar lining used with Irontite® ductile iron pipe, complies with AS/NZS 4020 "Testing of products for use in contact with drinking water"

Cement Mortar Lining Thickness (AS/NZS 2280)

DN	Product	Thickness (mm)	
		Nominal	Minimum
DN100 to DN600	Pipes	5	3.5
DN750		6	4.5
DN100 to DN600	Fittings	6	4
DN750		9	7

Polymeric coatings - Crevet® ductile iron fittings

Crevet® ductile iron fittings are supplied with a thermal bonded polymeric coating, such as Polyamide (thermoplastic coating) or Fusion Bonded Epoxy (FBE – thermosetting coating). Other thermo-set coatings are also available upon request.

Both types of coating provide the necessary protection for ductile iron fittings and can be installed without the need for sleeving. Bitumen coated products will require sleeving for corrosion protection.

Thermoplastic and thermosetting coatings are applied and tested to the requirements of AS/NZS 4158. Typical tests include film thickness, adhesion and continuity during manufacture to ensure coating integrity.

Coatings thickness as per AS/NZS 4158

Coating material	Minimum film thickness internal surface (um)	Minimum film thickness external surface (um)
Polyamide (Thermoplastic)	250	200
FBE (Thermosetting)	350	300

Note: 1 um = 1/1000th of a millimetre.

Bitumen coatings - (Non standard option for fittings)

Bitumen coating applied to both cement lined and unlined fittings, comply with the requirements of AS/NZS 3750.4.

2.6 Product markings

Marking of ductile iron pipe

All Irontite® ductile iron pipes are branded with the following for identification and traceability.

1. CREVET / ACMC / XINXING
2. Nominal diameter DN
3. The pipe class PN
4. The Australian standard the pipe complies with(AS/NZS 2280… etc)
5. StandardsMark license number SMK 0950/1
6. Batch number

Pipe class colour identification

A colour band located on the pipe socket can easily identify the pipe class. Blue represents 'Flange class' pipe and red, represents PN35 pressure class pipe.

Pipe marking with red colour identification for PN35 Irontite® pipe

Pipe marking with blue colour identification for Flange class pipe

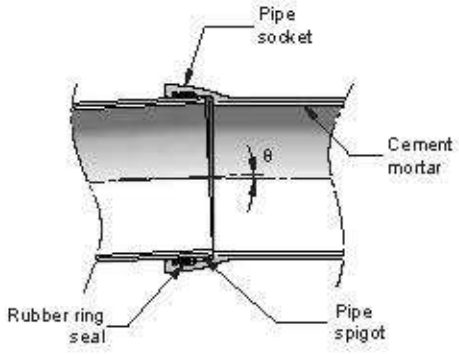
Marking of Crevet® ductile iron fittings

Crevet® ductile iron fittings are marked with the following

1. NIBF
2. Nominal diameter (DN)
3. DI (Ductitle iron)
4. Where applicable the angle of the bend etc.
5. Pressure class (PN)
6. AS/NZS 2280

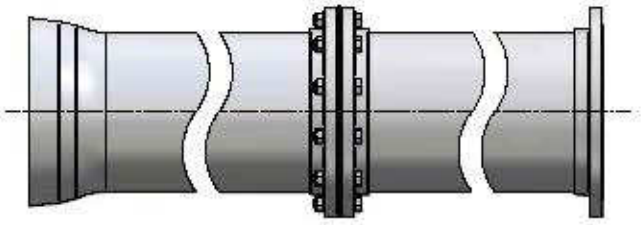
2.7 Pipe joint details

Spigot x socket rubber ring



Iplex Irontite® pipes are supplied with the standard spigot and socket rubber ring joint system for all sizes up to and including DN750. The socket is an integral part of the pipe and allows limited rotational deflection for gradual changes of direction or grade. The main features of the spigot and socket joint are ease of assembly and jointing and angular deflection.

Flange joints



Irontite® pipes are also available with flanged joints for connection to other pipe materials. Flanged pipes and fittings are generally used in above ground assemblies and installation in valve chambers. Flange joints are completely rigid and should not be used in applications where movement is envisaged, unless special provision is made to accommodate the movement through expansion joints.

Flange joints must not be used to support valves, fittings and cantilevered pipes as this may cause leaks to develop between the pipe and screwed flange.

Flanges are attached to the pipe by screwing the pipe and flange with mating threads. Flange joints are composed of two flanges and an elastomeric gasket and bolts. The seal is obtained by tightening the bolts, thus compressing the gasket. The effective seal is a function of the bolt tension and gasket design.

The pressure resistance of the flange component is indicated by its PN. Irontite® flanged pipes are manufactured with PN16 and PN35 flanges complying with Australian and New Zealand Standards AS/NZS 2280 "Ductile iron pipes and fittings" and AS/NZS 4087 "Metallic flanges for waterworks purpose".

For bolting compatibility the flange drillings manufactured to the Australian standards, the bolt PCD, outside diameter, number and diameter of bolt holes can be determined from the purchaser's order, or as specified on the constuction drawings. Note: that for rated pressures greater than 1600kPa and up to 3500kPa, PN35 configuration of AS/NZS 4087 should be used which is also compatible with Tables F and H drillings in AS 2129.

Ring stiffness and allowable deflection

The use of pressure ratings for the classification of ductile iron pipes has allowed a more efficient use of the ductile iron material, resulting in lighter weight pipes and thinner walls compared with the traditional K9 pipe classification.

As a result ring stiffness and embedment design must be considered with the new pipe classifications. In additional, the allowable pipe ring deflections must also be determined to ensure a safe design.

Ring bending stiffness values for Irontite® ductile Iron pipes are given in Table 1. The ring stiffness for each size has been calculated using formula given in section 2.2 in AS/NZS 2566 'Buried flexible pipelines Part 1: Structual design'

The wall thickness used to calculate the ring bending stiffness is equal to:

$$T_{PIPE\ STIFFNESS'} = \left[\frac{a+t}{2}\right] + 0.1\,T_c \quad \text{.....Equation 2}$$

Where

$T_{PIPE\ STIFFNESS}$

a = Specified minimum wall thickness in (mm)

t = Specified nominal wall thickness in (mm)

T_c = Cement mortar lining thickness in (mm)

Refer to WSAA TN3 'Guidelines for the pipe ring bending stiffness and allowable deflection of ductile iron pipe' for further information.

Table 1: Ring bending stiffness values for PN35 DICL pipe based on $T_{PIPE\ STIFFNESS}$[1]

DN	Pipe ring bending stiffness N (mm)
100	695,016
150	219,923
200	95,933
225	78,619
250	75,122
300	63,461
375	54,832
450	49,439
500	47,684
600	43,501
750	40,258

AS/NZS 2566.1 limits the ring deflection of ductile iron pipes to 2%, whilst the European standards for ductile iron pipes allows for ring deflections up to 4%. The allowable ring deflection of ductile iron cement lined pipes is limited to prevent yielding of the ductile iron material and damage to the cement mortar lining. The joint should also be able to withstand the loading associated with the proposed ring deflection. Refer to table on page 5.

[1] *Reference WSAA TN3 'Guidelines for the pipe ring bending stiffness and allowable deflection of ductile iron pipe.*

2.8 Fittings joint details

Socket details for Crevet® fittings

The socket designs provide an increased effective sealing length to cope with all modern pipeline materials including minimum deflections as per AS/NZS 2280. Pressure sensitive lip seals provide drip tight sealing under static and dynamic heads. The lip seals ensure adequate compression in the event of "spigot sag" in the socket of larger fittings.

The beveled socket face allows ease of joint assembly during pipeline laying procedures. Deep shouldered seal grooves also help reduce the risk of dislodging the seal during spigot entry.

Standard DI socket details

The standard range of ductile iron sockets has been designed for use with DICL, CICL, AC, Series 2 PVC-U, PVC-M, PVC-O & GRP pipes systems.

An adaption seal is also available when converting the standard socket from series 2 to series 1 sizes.

Griptite® socket details

The Griptite® socket range has been designed for use with DICL, CICL, AC, Series 2 PVC-U, PVC-M, PVC-O & GRP pipes systems.

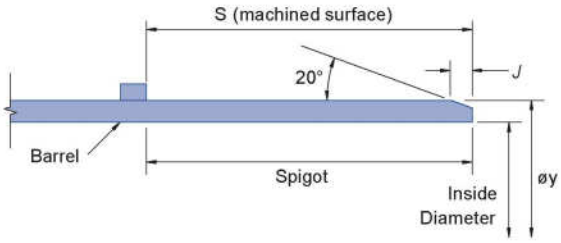
Nortite® socket details

The Nortite® range of sockets has been designed for use with Series 1 PVC pipe systems.

Testing of seals

Elastomeric seals are manufactured with dual hardness EPDM rubber to AS 1646. All of the seal configurations have been tested to AS/NZS 2280. The tests are carried out with a maximum design radial gap between the spigot and socket assembly. (that is, the smallest spigot is assembled with the largest socket). Typical tests include, hydrostatic pressure and infiltration tests at maximum joint deflection and shear load.

Spigot details



Spigots are manufactured in accordance with the dimensional requirements of AS/NZS 2280.

DN	Pipe & Fittings		Fittings	
	Mean outside diameter øy (mm)	Allowable Ovality (mm)	J (mm)	S (mm)
80	96 +1,-2	-	10 ±2	89
100	122 +1,-2	4	10 ±2	102
150	177 +1,-2	5	10 ±2	102
200	232 +1,-2	7	10 ±2	115
225	259 +1,-2	8	10 ±2	115
250	286 +1,-2	9	10 ±2	115
300	345 +1,-2	10	10 ±2	115
375	426 ±2	12	16 ±2	140
450	507 ±2	15	16 ±2	140
500	560 ±2	15	16 ±2	140
600	667 ±2	15	16 ±2	140
750	826 ±2	15	20 ±2	170

Spigot / Flange tee

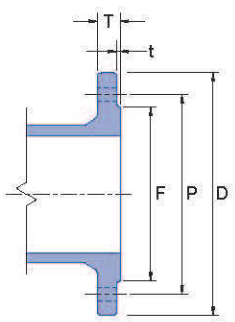
Flange dimensions and details

Nominal diameter 'DN'	Pressure class 'PN'	Flange outside diameter (mm)	Flange Thickness 'T' (mm)	Pitch circle diameter 'P' (mm)	Raised face diameter 'F' (mm)	Raised face height 't' (mm)	Number of bolt holes	Bolt hole diameter (mm)	Bolt size and suggested length[2] (mm)
100	14 Table E drilling[1]	215	22	178	154	3	8	18	M16 x 75
150		280	22	235	211	3	8	22	M20 x 75
200		335	25	292	268	3	8	22	M20 x 90
225		370	25	324	300	3	12	22	M20 x 90
250		405	25	356	328	3	12	22	M20 x 90
300		455	29	406	378	4	12	26	M24 x 100
375		550	32	495	463	4	12	26	M24 x 100
450		640	35	584	552	4	16	26	M24 x 120
500		705	38	641	609	4	16	26	M24 x 120
600		825	41	756	720	5	16	33	M30 x 130
750		995	48	927	888	5	20	36	M33 x 130
100	16 Figure B5 AS 4087	215	20	178	154	3	4	18	M16 x 75
150		280	23	235	211	3	8	18	M16 x 75
200		335	23	292	268	3	8	18	M16 x 90
225		370	24	324	300	3	8	18	M16 x 90
250		405	24	356	328	3	8	22	M20 x 90
300		455	30	406	378	4	12	22	M20 x 100
375		550	33	495	463	4	12	26	M24 x 100
450		640	33	584	552	4	12	26	M24 x 120
500		705	35	641	609	4	16	26	M24 x 120
600		825	42	756	720	5	16	30	M27 x 130
750		995	47	927	888	5	20	33	M30 x 130
100	35 Figure B6 AS 4087	230	22	191	167	3	8	18	M16 x 90
150		305	27	260	232	3	12	22	M20 x 90
200		370	31	324	296	3	12	22	M20 x 100
225		405	35	356	324	3	12	26	M24 x 120
250		430	34	381	349	3	12	26	M24 x 120
300		490	38	438	406	4	16	26	M24 x 120
375		580	42	521	485	4	16	30	M27 x 130
450		675	46	610	571	4	20	33	M30 x 150
500		735	49	673	634	4	24	33	M30 x 150
600		850	54	781	739	5	24	36	M33 x 180
750		1015	59	940	898	5	28	36	M33 x 180

[1] *Table E drilling is sometimes required for connection to other pipeline components with the same flange table drilling.*

[2] *The suggested bolt lengths are based on ductile iron to ductile iron flange connections. For insulated joints, longer bolt lengths may be required. Contact Iplex Pipelines for further details.*

Flange pipe joints



Bolt and gasket requirements

For PN16 flanges, galvanized carbon steel grade 4.6 or 316 stainless steel grade 50 bolts, nuts and washers are required as a minimum.

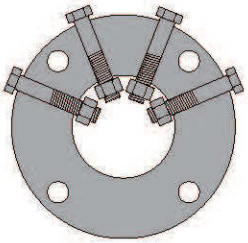
For PN35 flanges, galvanized carbon steel grade 8.8 or 316 stainless steel grade 70 bolts, nuts and washers are required as a minimum.

Metal washers of similar material to the fasteners shall be used with all ductile iron flanges. Appropriate bolt torques for ductile iron flange fasteners are listed in the table below. These vary depending on the operating and rated pressure of the flange system and values for intermediate pressures may be interpolated.

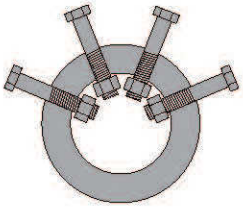
Solid EPDM gaskets 3mm thick complying with WSA 109 for flanges rated up to PN16 shall be used. For flanges rated up to PN35, 1.5mm thick fibre gaskets are recommended.

For flanged joint assembly proceedures refer to 'flanged joints' in the Installation section.

Full face kit



Narrow face kit



Recommended bolt tightening torques for ductile iron flanges[1]

DN	PN16[2] Lightly oiled	PN16[3] Well lubricated	PN35[2] Lightly oiled	PN35[3] Well lubricated
100	80Nm	55Nm	180Nm	130Nm
150	60Nm	40Nm	290Nm	200Nm
200	80Nm	55Nm	410Nm	280Nm
225	85Nm	60Nm	570Nm	390Nm
250	155Nm	105Nm	620Nm	430Nm
300	125Nm	85Nm	580Nm	400Nm
375	220Nm	150Nm	840Nm	570Nm
450	280Nm	190Nm	990Nm	690Nm
500	275Nm	185Nm	1030Nm	700Nm
600	400Nm	270Nm	1420Nm	970Nm
750	530Nm	360Nm	1670Nm	1140Nm

[1] *WSAA Standard WSA 109 'Industry standard for flanges, gaskets and 'o' rings'.*

[2] *Lightly oiled refers to the application of a good quality lubricating oil and is the usual as-received condition of fasteners.*

[3] *Well lubricated refers to the application of molybdenum disulphide grease or equivalent anti-seize compound.*

Dimensions of washers to AS 1237.1 - 2002 required for flange nuts and bolts

Size of bolt	Galvanised steel		Stainless steel	
	Outside washer diameter (mm)	Nominal thickness (mm)	Outside washer diameter (mm)	Nominal thickness (mm)
M16	30	3	30	1.5
M20	37	3	37	2.0
M22	44	4	44	3
M27	50	3	50	3
M33	60	3	60	3

2.9 Hydraulic Design

Hydraulic performance

To assist the designer in selecting the appropriate diameter, pipe flow charts based on the Colebrook White Transition Equation have been prepared for the designer to determine the relationship between friction loss, discharge and velocity for all available diameters of the Irontite® ductile iron pipe range.

The Irontite® ductile iron flow resistance charts have been limited to the following predetermined parameters,

1. Temperature @ 20°C, which is considered to be a suitable mean value for Australian conditions.
2. Kinematic viscosity of water, u = 1.01 x 10^{-6} m^2/s and
3. Equivalent wall roughness coefficients k = 0.01mm, 0.03mm and 0.06mm for cement mortar lined pipes with or without seal coats.

Roughness coefficients

The equivalent roughness coefficients value "k" assumes the Irontite® ductile iron pipeline is straight, clean and concentrically jointed without fittings. Possible values ranging between 0.01 to 0.06mm for cement-lined pipes are given in AS 2200 "Design charts for water supply and sewerage".

The lower value in the range represents the expected value for clean, new pipes laid straight. The higher value in the range represents the typical maximum expected for ductile iron pipes. It cannot be an absolute maximum, as the factors detailed below can lead to even higher roughness values in some circumstances.

Factors that will influence the roughness coefficients are listed as follows:

- Roughening, due to wear by abrasive solids
- Siltation or settlement of suspended particulate matter
- Joint imperfections and fitting types and configurations
- Growth of slime which will vary with the age of the pipeline and available nutrient in the water
- Deterioration of unlined ferrous surfaces.

Please note, it is important to ensure an appropriate roughness coefficient is selected for the given circumstances. Designers may assume a higher value is better and provides a high factor of safety. In fact, when dealing with hydraulic systems this is not necessarily the case. Choosing a value that is too high is equally detrimental to the design as choosing a value that is too low.

Where, for instance the system is a pumped main the choice of pumps will be compromised by choosing an inappropriate value for the roughness coefficient. A value that is too high will result in pumps being oversized meaning they will not run at their best efficiency point (B.E.P) and will likely cause issues such as cavitations and possibly premature failure of the pumps. A value that is too low will result in pumps being undersized meaning they will not run at their B.E.P and will result in flow starvation.

Water temperature

The kinematic viscosities for water at various temperatures are given in AS 2200 "Design charts for water supply and sewerage".

An approximate allowance for the effect of variation in water temperature can be made by increasing the chart value of the head loss by 1% for each 3ºC below 20ºC and by decreasing it by 1% for each 3ºC in excess of 20ºC.

Design

The flow charts provide a convenient graphical mean and are sufficiently accurate for most practical purpose. The roughness coefficient '*k*' shown in 'Hydraulic performance' is for raw and potable water.

Calculations are based on the Colebrook White Transition Equation and it is assumed pipes are flowing full.

$$v = -2\sqrt{2gDS}\log\left[\frac{k}{3.7D} + \frac{2.5lv}{d\sqrt{2gDS}\log}\right] \quad \text{.....Equation 3}$$

Where

k = Colesbrook White roughness coefficient, in (m)
v = Velocity, in (m/s)
D = Circular cross-section of pipe, inside diameter, in (m)
S = Slope, in (m/m)
g = gravitational acceleration, in (m/s^2)

This equation takes into account, liquid viscosity and pipe roughness and is commonly used for pipeline design in Australia. It is also regarded throughout the world as the most accurate basis for hydraulic design.

Resistance losses in fittings

The flow resistance losses in fittings can be related to the equivalent losses in metres of straight pipe. These losses can then be added to the length of the main pipe in order to determine the total friction loss of the system.

Resistance losses at fittings are calculated as follows:

$$H_L = \frac{kv^2}{2g} \quad \text{.....Equation 4}$$

Where

H_L = approximate head loss in meters of water
k = Value of coefficient
v = Velocity in m/s
g = acceleration due to gravity in m/s^2

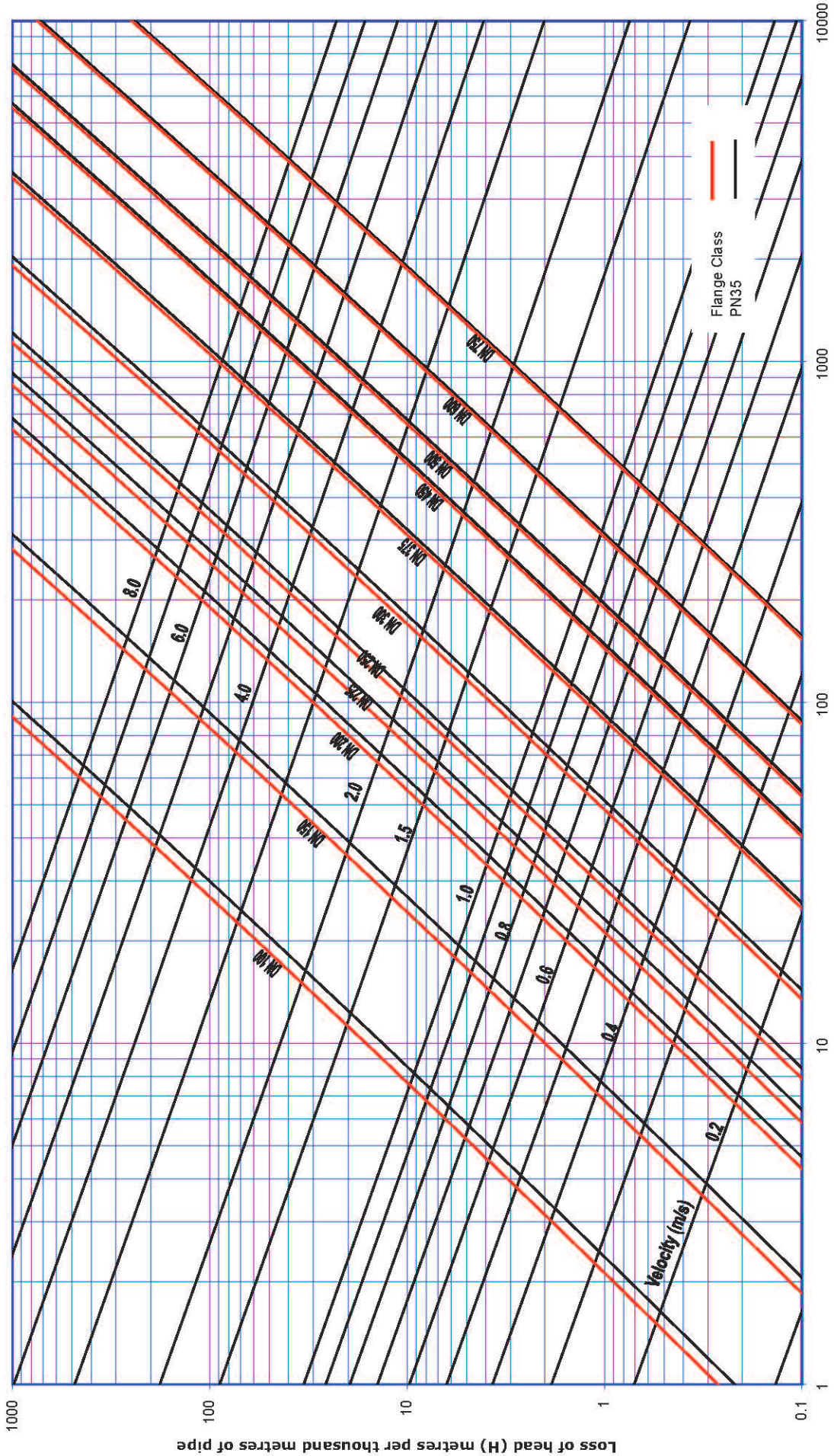
Resistance coefficients of valves and fittings can be obtained from AS 2200 "Design charts for water supply and sewerage"

Design flow velocities

The Water Services Association of Australia Code WSA O3 design recommendations can be applied to ductile iron pipe installations. In pumped transmission mains where capital cost and discounted running costs are taken into account the Code suggests that the most economic design will have velocities in the range 1 to 2m/s. However there may be circumstances where 2.0m/s is acceptable or 4m/s for short periods. The water agency's advice shall be sought when velocities in excess of 3m/s are being considered on cement-lined pipes.

To facilitate economic designs, the head losses should not exceed 5m/km for ≤DN150 and 3m/km for pipes ≥ DN200. Where the pipeline is carrying clean water the design velocity should not exceed 4 m/s.

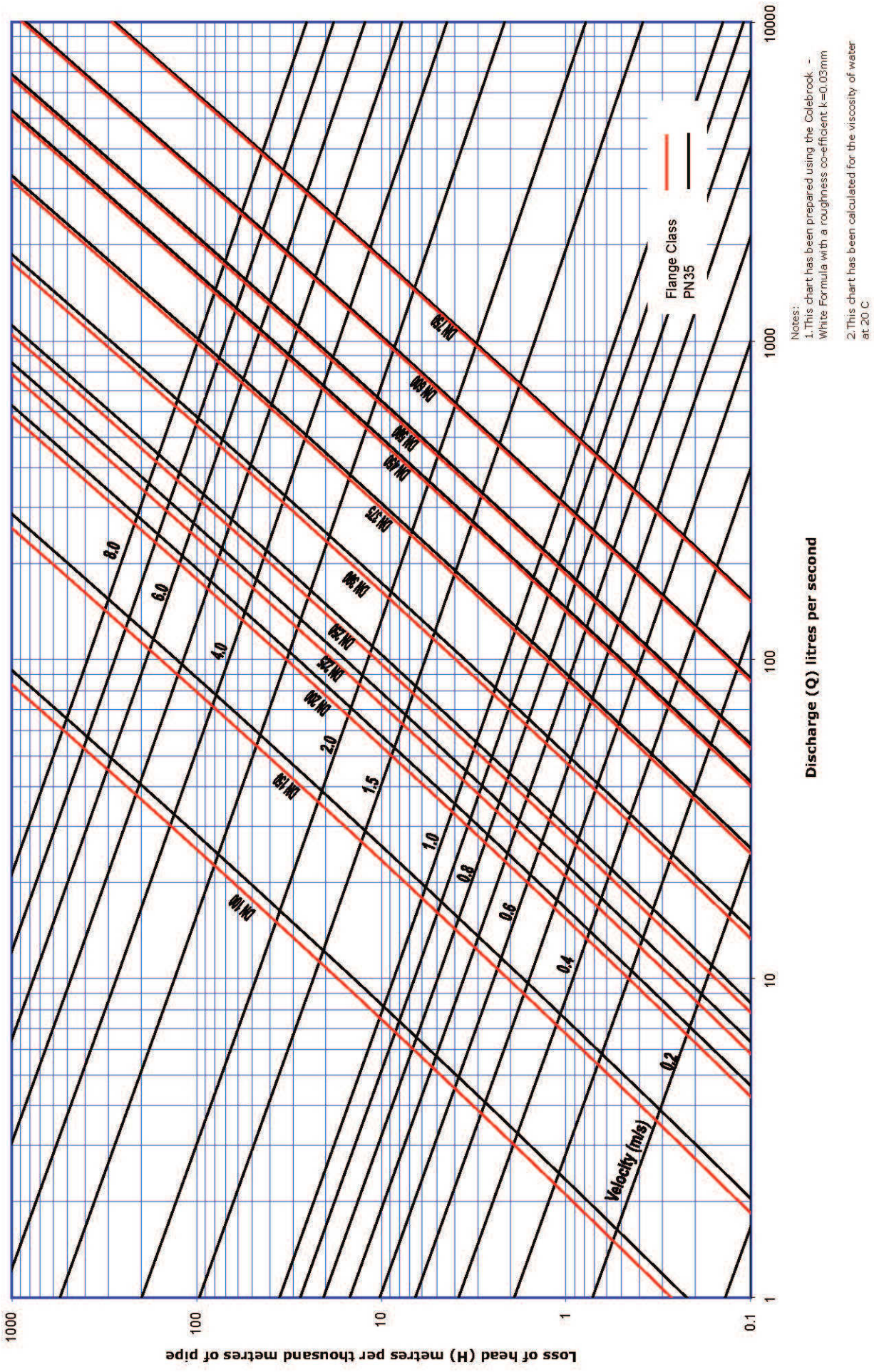
Flow resistance chart - IRONTITE® ductile iron cement lined pipe. Colebrook White roughness co-effiecient k = 0.01m



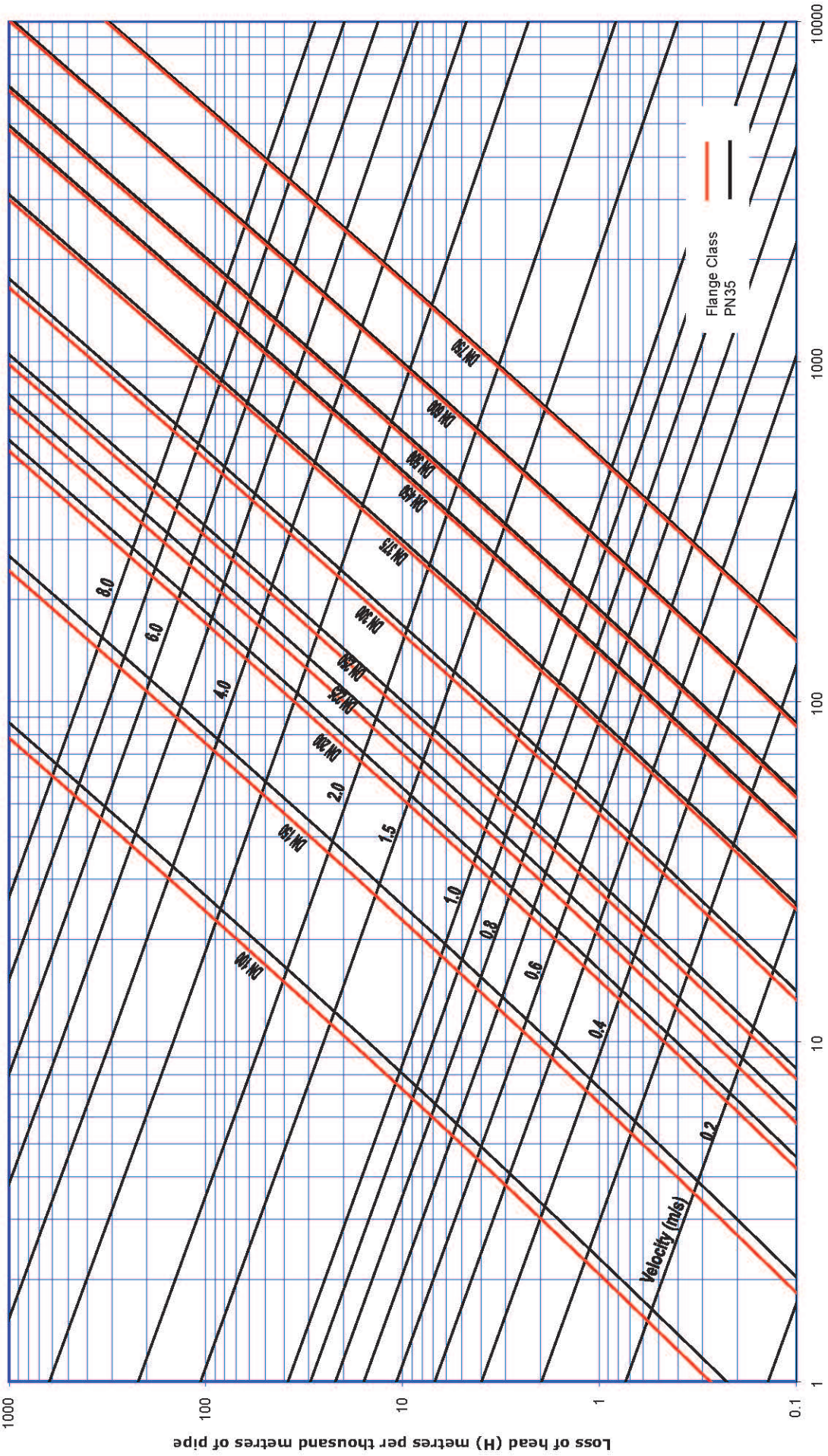
Notes:
1.This chart has been prepared using the Colebrook - White Formula with a roughness co-efficient k=0.01mm

2.This chart has been calculated for the viscosity of water at 20 C

Flow resistance chart - IRONTITE® ductile iron cement lined pipe. Colebrook White roughness co-effiecient k = 0.03m.



Flow resistance chart - IRONTITE® ductile iron cement lined pipe. Colebrook White roughness co-effiecient k = 0.06mm



Notes:
1.This chart has been prepared using the Colebrook - White Formula with a roughness co-efficient k=0.06mm

2.This chart has been calculated for the viscosity of water at 20 C

3.0 Irontite® ductile iron pipe and sleeving

Standard Irontite®

The standard Irontite® ductile iron pipe is manufactured to AS/NZS 2280 in sizes DN100 to DN750 complete with push-fit rubber ring joints or flange joints, cement mortar lining and a composite zinc and epoxy coating system.

Irontite® with seal coat

For application where detention time in the pipeline can result in deterioration of the water quality, a bituminous seal coat can be applied to the cement mortar lining in accordance with ISO 1612. The seal coating is standard for sizes DN100 to DN300 and optionally available for larger sizes subject to minimum order quantities.

Irontite® with polyurethane coating (subject to minimum order quantity)

For very aggressive ground conditions where loose polyethylene sleeving is not recommended, the industry has a new choice in coating options for ductile iron pipe, Polyurethane (PU). Polyurethane is a tough, high bond coating systems, able to withstand some of the harshest environments, providing optimum protection against corrosion.

Diameter range

The standard Irontite® range is from DN100 to DN750, where larger diameters are required contact Iplex Pipelines.

Spigot x socket rubber ring joint Irontite® ductile iron pipe

Product code	Description 1	Description 2	Joint type
C300.0100SC	DN100 PN35 DI Irontite® Pipe	x 5.7m effective length CL Seal Coat	Spigot x Socket RRJ
C300.0150SC	DN150 PN35 DI Irontite® Pipe	x 5.7m effective length CL Seal Coat	Spigot x Socket RRJ
C300.0200SC	DN200 PN35 DI Irontite® Pipe	x 5.7m effective length CL Seal Coat	Spigot x Socket RRJ
C300.0225SC	DN225 PN35 DI Irontite® Pipe	x 5.7m effective length CL Seal Coat	Spigot x Socket RRJ
C300.0250SC	DN250 PN35 DI Irontite® Pipe	x 5.7m effective length CL Seal Coat	Spigot x Socket RRJ
C300.0300SC	DN300 PN35 DI Irontite® Pipe	x 5.7m effective length CL Seal Coat	Spigot x Socket RRJ
C300.0375	DN375 PN35 DI Irontite® Pipe	x 5.7m effective length CL	Spigot x Socket RRJ
C300.0450	DN450 PN35 DI Irontite® Pipe	x 5.7m effective length CL	Spigot x Socket RRJ
C300.0500	DN500 PN35 DI Irontite® Pipe	x 5.7m effective length CL	Spigot x Socket RRJ
C300.0600	DN600 PN35 DI Irontite® Pipe	x 5.7m effective length CL	Spigot x Socket RRJ
C300.0750	DN750 PN35 DI Irontite® Pipe	x 5.7m effective length CL	Spigot x Socket RRJ

'Flange Class' ductile iron pipe

Irontite® DI spigot x socket pipes are manufactured with an effective laying length of 5.7m. The tolerance on the standard length is ±30mm.

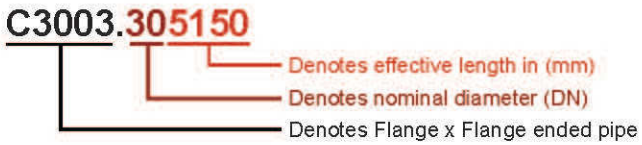
Irontite® flanged pipes are available in nominal maximum lengths of up to 5.915m*. The tolerances on the length of flanged pipes are as followings:

- Flanged one end
  ± 6.0mm
- Flanged both ends
  DN100 to DN300 ± 1.5mm
  DN375 to DN600 ± 2.5mm
  DN750 ± 4.0mm

**Note: The length limited imposed by AS/NZS 2280 is 5350mm. However, the Irontite® manufacturing process allows longer lengths (up to 5500mm) for Flange class pipe, which does not comply with the length limited imposed by this standard.*

Product code example

Example 1 – DN300 PN16 DI Irontite® pipe, x 5150mm effective length CL, flange x flange



Example 2 – DN300 PN35 DI Irontite® pipe, x 5150mm effective length CL, flange x flange

Flange x flange PN16 and PN35 Irontite® ductile iron pipe

Base product code[1]	Description 1	Description 2[2]	Joint type
C3003.10¤¤¤¤¤	DN100 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.15¤¤¤¤¤	DN150 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.20¤¤¤¤¤	DN200 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.22¤¤¤¤¤	DN225 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.25¤¤¤¤¤	DN250 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.30¤¤¤¤¤	DN300 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.37¤¤¤¤¤	DN375 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.45¤¤¤¤¤	DN450 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.50¤¤¤¤¤	DN500 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.60¤¤¤¤¤	DN600 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange
C3003.75¤¤¤¤¤	DN750 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Flange

[1] For standard metallic zinc and 2-part epoxy coated, cement lined pipe
[2] Maximum allowable length based on the manufacturing process
Note: For length configuration add the length at the end of the product code as shown in the example 1.
For PN35 pipes add 'F' at the end of the product code as shown in example 2.

Flange x spigot PN16 and PN35 Irontite® pipe

Base product code[1]	Description 1	Description 2[2]	Joint type
C3004.10¤¤¤¤¤	DN100 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.15¤¤¤¤¤	DN150 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.20¤¤¤¤¤	DN200 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.22¤¤¤¤¤	DN225 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.25¤¤¤¤¤	DN250 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.30¤¤¤¤¤	DN300 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.37¤¤¤¤¤	DN375 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.45¤¤¤¤¤	DN450 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.50¤¤¤¤¤	DN500 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.60¤¤¤¤¤	DN600 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot
C3004.75¤¤¤¤¤	DN750 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Spigot

[1] For standard metallic zinc and 2-part epoxy coated, cement lined pipe
[2] Maximum allowable length based on the manufacturing process
Note: For length configuration add the length at the end of the product code as shown in the example 1.
For PN35 pipes add 'F' at the end of the product code as shown in example 2.

Flange x socket PN16 and PN35 Irontite® pipe

Base product code[1]	Description 1	Description 2[2]	Joint type
C3007.10¤¤¤¤¤F	DN100 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.15¤¤¤¤¤F	DN150 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.20¤¤¤¤¤F	DN200 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.22¤¤¤¤¤F	DN225 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.25¤¤¤¤¤F	DN250 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.30¤¤¤¤¤F	DN300 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.37¤¤¤¤¤F	DN375 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.45¤¤¤¤¤F	DN450 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.50¤¤¤¤¤F	DN500 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.60¤¤¤¤¤F	DN600 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket
C3007.75¤¤¤¤¤F	DN750 PN16 DI Irontite® Pipe	XXXX mm effective length CL	Flange x Socket

[1] For standard metallic zinc and 2-part epoxy coated, cement lined pipe
[2] Maximum allowable length based on the manufacturing process
Note: For length configuration add the length at the end of the product code as shown in the example 1.
For PN35 pipes add 'F' at the end of the product code as shown in example 2.

Spigot x spigot PN35 Irontite®

Base product code[1]	Description 1	Description 2[2]	Joint type
C3005.10□□□□□F	DN100 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.15□□□□□F	DN150 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.20□□□□□F	DN200 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.22□□□□□F	DN225 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.25□□□□□F	DN250 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.30□□□□□F	DN300 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.37□□□□□F	DN375 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.45□□□□□F	DN450 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.50□□□□□F	DN500 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.60□□□□□F	DN600 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot
C3005.75□□□□□F	DN750 PN35 DI Irontite® Pipe	XXXX mm effective length CL	Spigot x Spigot

[1] For standard metallic zinc and 2-part epoxy coated, cement lined pipe
[2] Maximum allowable length based on the manufacturing process
Note: For length configuration add the length at the end of the product code as shown in the example 1.

Irontite® sleeving

Base product code	Description 1	Description 2
Blue Sleeving - Portable water applications		
C3092.10BFW	350 DI BLUE SLEEVE DN80-DN100	x 6.1m - 30 sleeves/roll
C3092.15BFW	425 DI BLUE SLEEVE DN150	x 6.1m - 25 sleeves/roll
C3092.20BFW	525 DI BLUE SLEEVE DN200	x 6.1m - 20 sleeves/roll
C3092.25BFW	635 DI BLUE SLEEVE DN225-DN250	x 6.1m - 17 sleeves/roll
C3092.30BFW	725 DI BLUE SLEEVE DN300	x 6.1m - 15 sleeves/roll
C3092.37BFW	875 DI BLUE SLEEVE DN375	x 6.1m - 12 sleeves/roll
C3092.45BFW	1100 DI BLUE SLEEVE DN450-DN500	x 6.1m - 10 sleeves/roll
C3092.60BFW	1270 DI BLUE SLEEVE DN600	x 6.1m - 8 sleeves/roll
C3092.75BFW	1500 DI BLUE SLEEVE DN750	x 6.1m - 7 sleeves/roll
Lilac Sleeving - Recycled water applications		
C30921.10LFW	350 DI LILAC SLEEVE DN80-DN100	x 6.1m - 30 sleeves/roll
C30921.15LFW	425 DI LILAC SLEEVE DN150	x 6.1m - 25 sleeves/roll
C30921.20LFW	525 DI LILAC SLEEVE DN200	x 6.1m - 20 sleeves/roll
C30921.25LFW	635 DI LILAC SLEEVE DN225-DN250	x 6.1m - 17 sleeves/roll
C30921.30LFW	725 DI LILAC SLEEVE DN300	x 6.1m - 15 sleeves/roll
C30921.37LFW	875 DI LILAC SLEEVE DN375	x 6.1m - 12 sleeves/roll
C30921.45LFW	1100 DI LILAC SLEEVE DN450-DN500	x 6.1m - 10 sleeves/roll
C30921.60LFW	1270 DI LILAC SLEEVE DN600	x 6.1m - 8 sleeves/roll
C30921.75LFW	1500 DI LILAC SLEEVE DN750	x 6.1m - 7 sleeves/roll
Cream Sleeving - Sewer applications		
C3092.10CFW	350 DI CREAM SLEEVE DN80-DN100	x 6.1m - 30 sleeves/roll
C3092.15CFW	425 DI CREAM SLEEVE DN150	x 6.1m - 25 sleeves/roll
C3092.20CFW	525 DI CREAM SLEEVE DN200	x 6.1m - 20 sleeves/roll
C3092.25CFW	635 DI CREAM SLEEVE DN225-DN250	x 6.1m - 17 sleeves/roll
C3092.30CFW	725 DI CREAM SLEEVE DN300	x 6.1m - 15 sleeves/roll
C3092.37CFW	875 DI CREAM SLEEVE DN375	x 6.1m - 12 sleeves/roll
C3092.45CFW	1100 DI CREAM SLEEVE DN450-DN500	x 6.1m - 10 sleeves/roll
C3092.60CFW	1270 DI CREAM SLEEVE DN600	x 6.1m - 8 sleeves/roll
C3092.75CFW	1500 DI CREAM SLEEVE DN750	x 6.1m - 7 sleeves/roll

3.1 Crevet SL® (Light-weight ductile iron fittings)

Crevet SL® lightweight, compact ductile iron fittings suitable for PVC-O, PVC-M, PVC-U, GRP and ductile iron pipe systems. These innovated fittings are available in sizes DN100 – DN300.

Features and benefits

Environmentally benefits – through use of less energy & materials

Light weight – giving benefits in manual handling & installation

Compact design – providing benefits in packaging & handling

Deep sockets – for use with all pipe systems including PVC-O, PVC-M, PVC-U, GRP and Ductile Iron

Compatible – can be used for Series 1 & Series 2 PVC pipe systems

Economical – Cost efficient use of materials

Corrosion Protected – fittings feature protective coating Plascoat PPA 571

Compliance

Crevet SL® fittings are manufactured in accordance with Australian Standards.

Certification – Product Certification StandardsMark SMK0950

Standards – AS/NZS 2280 Ductile iron pressure pipe and fittings
AS/NZS 4158 Thermal bonded polymeric coatings on valves & fittings
AS 4020 Testing of products for use in contact with drinking water

Allowable operating pressures

Range	PN	Allowable Operating Pressure (AOP) MPa	Maximum Allowable Operating Pressure (MAOP) MPa	Allowable Site Test Pressure (ASTP) MPa
Socket-Flange tees & Risers	16	1.60	1.92	2.00
Socketed bends, Socketed tees & Connectors	20	2.00	2.40	2.50

Socket Design

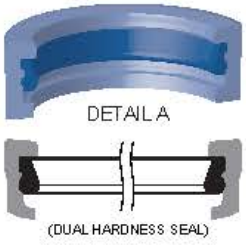
Size DN (mm)	Minimum Socket Depth (mm)		
	AS/NZS 2280 & TN2* minimum requirement	N.I.B.F Crevet SL® Series 1[1]	N.I.B.F Crevet SL® Series 2
100	42	73	75
150	50	82	85
200	58	87	85
225	62	90	87
250	66	97	92
300	71	100	102

* *WSAA TN2*
[1] *With adaptor seal*

Seals

EPDM Dual Hardness Seals, complying with the requirements of AS 1646

Series 2
PVC-O, PVC-M, PVC-U, GRP and ductile iron seal configurations



DN (mm)	Product Code
100	C9615.10
150	C9615.15
200	C9615.20
225	C9615.22
250	C9615.25
300	C9615.30

Series 1
PVC-M, PVC-U, and ductile iron seal configurations

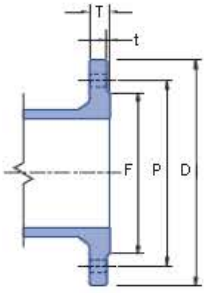
DN (mm)	Product Code
100	C9615.10A
150	C9615.15A
200	C9615.20A
225	C9615.22A
250	C9615.25A

Deflection

DN (mm)	Max. Deflection (Degrees)
100	3.5
150	3.5
200	3.5
225	3.5
250	3.5
300	2.5

Flanges

Conform to AS 4087 Figure B5, PN16

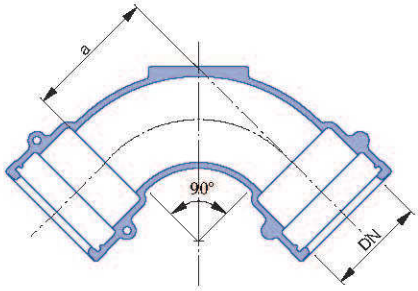


Size DN (mm)	PN	Flange Thick. (mm) T	Pitch Circle Dia. (mm) P	Raise Face Dia. (mm) F	Height of Raise Face (mm) t	No. of Bolts	Bolt Size (mm)	Bolts Hole Dia. (mm)	Suggested Bolts Length (mm)
100	16	20	178	154	3	4	M16	18	75
150	16	23	235	211	3	8	M16	18	75
200	16	23	292	268	3	8	M16	18	90
225	16	24	324	300	3	8	M16	18	90
250	16	24	356	328	3	8	M20	22	90
300	16	30	406	378	4	12	M20	22	100

Socket Bends 90°:

DN	Product Codes		Dim. (mm) a
	Series 2 / DICL PN35	Series 1[2] PN16	
80	-	C012.0890	115
100	C011.1090S[1]	C012.1090S	53
100	C011.1090	C012.1090	165
150	C011.1590S[1]	C012.1590S	72
150	C011.1590	C012.1590	205
200	C011.2090	C012.2090	220
225	C011.2290	C012.2290	250
250	C011.2590	C012.2590	275
300	C011.3090	C012.3090	325
375	C011.3790	C012.3790	405
450	C011.4590	-	480
500	C011.5090	-	535
575	-	C012.5790	635
600	C011.6090	C012.6090	635
750	C011.7590	-	795

[1] Crevet SL® Series 2 fittings are rated at PN20
[2] Series 1 fittings fitted with adaptor seal are rated at PN12



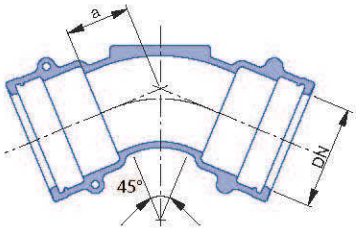
Product Specification

- **Application**: used for deflection of a pipeline

Socket Bends 45°:

DN	Product Codes		Dim. (mm) a
	Series 2 / DICL PN35	Series 1[2] PN16	
80	-	C012.0845	55
100	C011.1045S[1]	C012.1045S	32.5
100	C011.1045	C012.1045	80
150	C011.1545S[1]	C012.1545S	42
150	C011.1545	C012.1545	95
200	C011.2045	C012.2045	100
225	C011.2245	C012.2245	115
250	C011.2545	C012.2545	125
300	C011.3045	C012.3045	145
375	C011.3745	C012.3745	185
450	C011.4545	-	215
500	C011.5045	-	235
575	-	C012.5745	280
600	C011.6045	C012.6045	280
750	C011.7545	-	345

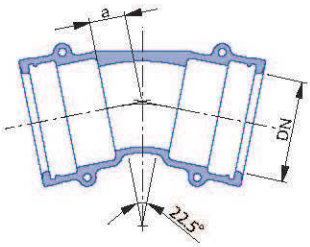
[1] Crevet SL® Series 2 fittings are rated at PN20
[2] Series 1 fittings fitted with adaptor seal are rated at PN12



Socket Bends 22½°:

DN	Product Codes		Dim. (mm) a
	Series 2 / DICL PN35	Series 1[2] PN16	
80	-	C012.0225	30
100	C011.1022S[1]	C012.1022S	20.5
100	C011.1022	C012.1022	45
150	C011.1522S[1]	C012.1522S	26.5
150	C011.1522	C012.1522	55
200	C011.2022	C012.2022	55
225	C011.2222	C012.2222	65
250	C011.2522	C012.2522	70
300	C011.3022	C012.3022	80
375	C011.3722	C012.3722	100
450	C011.4522	-	115
500	C011.5022	-	125
575	-	C012.5722	145
600	C011.6022	C012.6022	145
750	C011.7522	-	180

[1] Crevet SL® Series 2 fittings are rated at PN20
[2] Series 1 fittings fitted with adaptor seal are rated at PN12



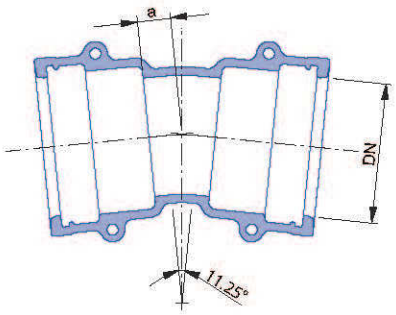
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN100& DN150 Socket fittings in PN35 are made to order only. Contact Customer Service for confirmation and availability.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket Bends 11¼°:

DN	Product Codes		Dim. (mm) a
	Series 2 / DICL PN35	Series 1[2] PN16	
80	-	C012.0811	30
100	C011.1011S[1]	C012.1011S	14
100	C011.1011	C012.1011	30
150	C011.1511S[1]	C012.1511S	18
150	C011.1511	C012.1511	35
200	C011.2011	C012.2011	35
225	C011.2211	C012.2211	45
250	C011.2511	C012.2511	45
300	C011.3011	C012.3011	50
375	C011.3711	C012.3711	65
450	C011.4511	-	70
500	C011.5011	-	75
575	-	C012.5711	85
600	C011.6011	-	85
750	C011.7511	-	105

[1] Crevet SL® Series 2 fittings are rated at PN20
[2] Series 1 fittings fitted with adaptor seal are rated at PN12

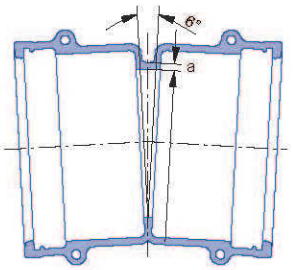


Product Specification

- **Adaptor seals:** Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Socket Bends 6°:

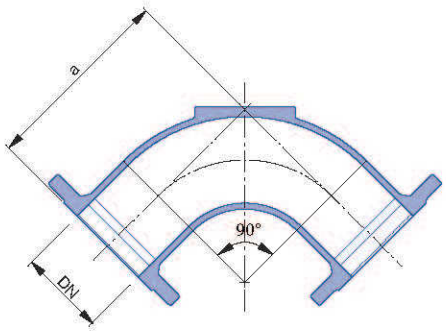
DN	Product Code Crevet SL® Series 2 / DICL PN20	Dim. (mm) a
100	C011.1006S	7
150	C011.1506S	9
225	C011.2256S	16
300	C011.3006S	21



Flange Bends 90°:

DN	Product Codes		Dim. (mm) a
	Flanged PN16	Flanged PN35	
80	C013.0890*	C013.0890F	152
100	C013.1090	C013.1090F	241
150	C013.1590	C013.1590F	279
200	C013.2090	C013.2090F	305
225	C013.2290	C013.2290F	330
250	C013.2590	C013.2590F	356
300	C013.3090	C013.3090F	406
375	C013.3790	C013.3790F	495
450	C013.4590	C013.4590F	572
500	C013.5090	C013.5090F	622
575	C013.5290	-	648
600	C013.6090	C013.6090F	737
750	C013.7590	C013.7590F	905

** For DN80 Flanged PN16 Dim. (mm) a = 141*



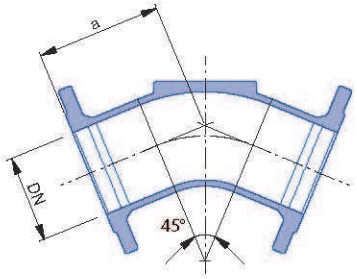
Product Specification

- **Applications**: used for deflection of a pipeline.

Note:
1. Bends with Table E flanges to AS 2129 are also available on request with suffix 'E'.
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN100& DN150 Socket fittings in PN35 are made to order only. Contact Customer Service for confirmation and availability.
4. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

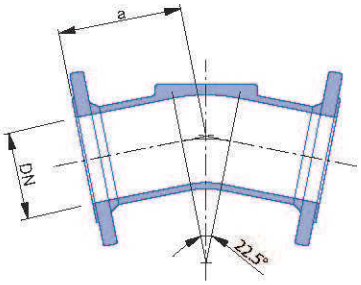
Flange Bends 45°:

DN	Product Codes		Dim. (mm) a
	Flanged PN16	Flanged PN35	
80	C013.0845	C013.0845F	152
100	C013.1045	C013.1045F	152
150	C013.1545	C013.1545F	190
200	C013.2045	C013.2045F	203
225	C013.2245	C013.2245F	229
250	C013.2545	C013.2545F	254
300	C013.3045	C013.3045F	305
375	C013.3745	C013.3745F	381
450	C013.4545	C013.4545F	457
500	C013.5045	C013.5045F	508
575	C013.5245	-	533
600	C013.6045	C013.6045F	610
750	C013.7545	C013.7545F	460



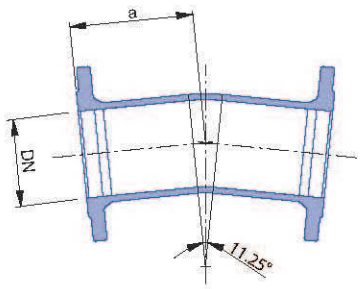
Flange Bends 22½°:

DN	Product Codes		Dim. (mm) a
	Flanged PN16	Flanged PN35	
80	C013.0822	C013.0822F	152
100	C013.1022	C013.1022F	152
150	C013.1522	C013.1522F	190
200	C013.2022	C013.2022F	203
225	C013.2222	C013.2222F	229
250	C013.2522	C013.2522F	254
300	C013.3022	C013.3022F	305
375	C013.3722	C013.3722F	381
450	C013.4522	C013.4522F	457
500	C013.5022	C013.5022F	508
575	C013.5222	-	533
600	C013.6022	C013.6022F	610
750	C013.7522	C013.7522F	295



Flange Bends 11¼°:

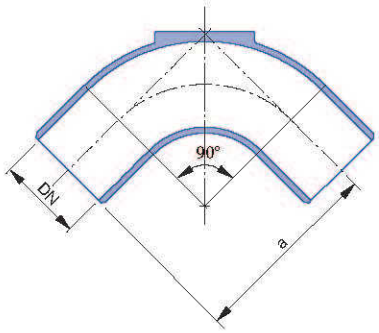
DN	Product Codes		Dim. (mm) a
	Flanged PN16	Flanged PN35	
80	C013.0811	C013.0811F	135
100	C013.1011	C013.1011F	152
150	C013.1511	C013.1511F	190
200	C013.2011	C013.2011F	203
225	C013.2211	C013.2211F	229
250	C013.2511	C013.2511F	254
300	C013.3011	C013.3011F	305
375	C013.3711	C013.3711F	381
450	C013.4511	C013.4511F	457
500	C013.5011	C013.5011F	508
575	C013.5211	-	533
600	C013.6011	C013.6011F	610
750	C013.7511	C013.7511F	230



Note:
1. Bends with Table E flanges to AS 2129 are also available on request with suffix 'E'.
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Spigot Bends 90°:

DN	Product Code PN35	Dim. (mm) a
80	C014.0890	190
100	C014.1090	254
150	C014.1590	292
200	C014.2090	318
225	C014.2290	343
250	C014.2590	368
300	C014.3090	419
375	C014.3790	521
450	C014.4590	597
500	C014.5090	648
575	C014.5290	673
600	C014.6090	749
750	C014.7590	935

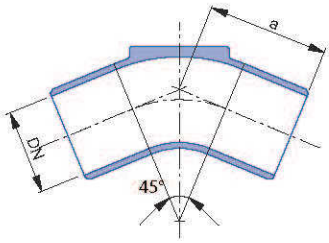


Product Specification

- **Applications:** used for deflection of a pipeline.

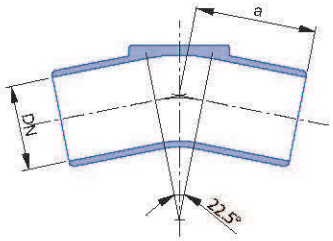
Spigot Bends 45°:

DN	Product Code PN35	Dim. (mm) a
80	C014.0845	182
100	C014.1045	182
150	C014.1545	209
200	C014.2045	249
225	C014.2245	260
250	C014.2545	270
300	C014.3045	298
375	C014.3745	348
450	C014.4545	405
500	C014.5045	414
575	C014.5245	430
600	C014.6045	481
750	C014.7545	485



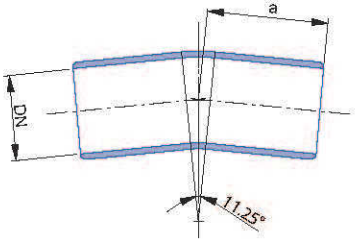
Spigot Bends 22½°:

DN	Product Code PN35	Dim. (mm) a
80	C014.0822	152
100	C014.1022	152
150	C014.1522	190
200	C014.2022	203
225	C014.2222	229
250	C014.2522	254
300	C014.3022	305
375	C014.3722	381
450	C014.4522	457
500	C014.5022	508
575	C014.5222	533
600	C014.6022	610
750	C014.7522	460



Spigot Bends 11¼°:

DN	Product Code PN35	Dim. (mm) a
80	C014.0811	150
100	C014.1011	150
150	C014.1511	161
200	C014.2011	185
225	C014.2211	188
250	C014.2511	190
300	C014.3011	201
375	C014.3711	228
450	C014.4511	248
500	C014.5011	254
575	C014.5211	262
600	C014.6011	289
750	C014.7511	245

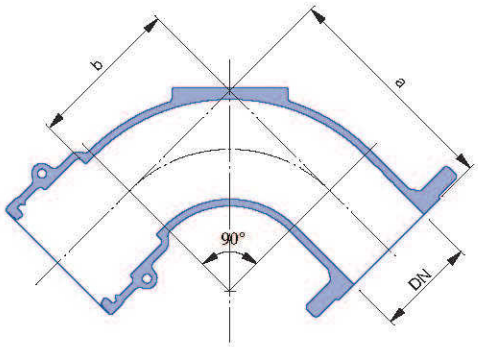


Note: 1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket - Flange Bends 90°:

DN	Product Codes		Dim. (mm) a	Dim. (mm) b
	Series 2 / DICL PN16	Series 1[2] PN16		
100	C0113.1090S[1]	C0123.1090S[1]	141.5	70
100	C0113.1090	C0123.1090	245	165
150	C0113.1590S[1]	C0123.1590S[1]	188	100
150	C0113.1590	C0123.1590	279	205
200	C0113.2090	C0123.2090	305	220
225	C0113.2290	C0123.2290	330	250
250	C0113.2590	C0123.2590	356	275
300	C0113.3090	C0123.3090	406	325
375	C0113.3790	C0123.3790	495	405

[1] Crevet SL® fittings
[2] Series 1 fittings fitted with adaptor seal are rated at PN12



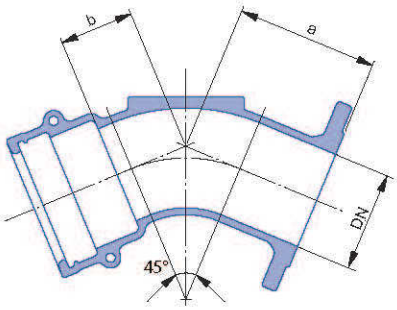
Product Specification

- **Application**: used for deflection of a pipeline
- **Flanges** : PN16 to AS 4087

Socket - Flange Bends 45°:

DN	Product Codes		Dim. (mm) a	Dim. (mm) b
	Series 2 / DICL PN16	Series 1[1] PN16		
80	-	C0113.0845	80	120
100	C0113.1045	C0113.1045	152	80
150	C0113.1545	C0113.1545	190	95

[1] Series 1 fittings fitted with adaptor seal are rated at PN12



Product Specification

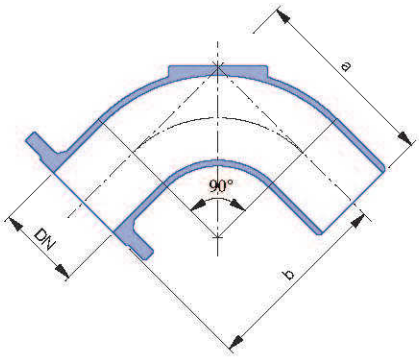
- **Flanges** : PN16 to AS 4087

Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Bends with Table E flanges to AS 2129 are also available on request with suffix 'E'.
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

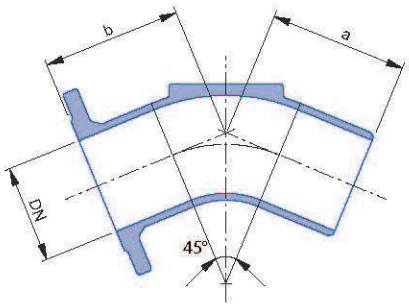
Flange - Spigot Bends 90°:

DN	Product Code DICL PN16	Dim. (mm) a	Dim. (mm) b
80	C0134.0890	190	152
100	C0134.1090	254	241
150	C0134.1590	292	279
200	C0134.2090	318	305
225	C0134.2290	343	330
250	C0134.2590	368	356
300	C0134.3090	419	406
375	C0134.3790	521	495
450	C0134.4590	597	572
500	C0134.5090	648	622
575	C0134.5290	673	648
600	C0134.6090	749	737
750	C0134.7590	935	905



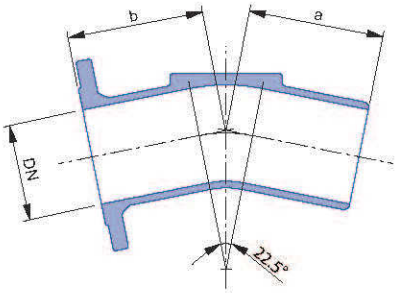
Flange - Spigot Bends 45°:

DN	Product Code DICL PN16	Dim. (mm) a	Dim. (mm) b
80	C0134.0845	182	152
100	C0134.1045	182	152
150	C0134.1545	209	190
200	C0134.2045	249	203
225	C0134.2245	260	229
250	C0134.2545	270	254
300	C0134.3045	298	305
375	C0134.3745	348	381
450	C0134.4545	405	457
500	C0134.5045	414	508
575	C0134.5245	430	533
600	C0134.6045	481	610
750	C0134.7545	485	460



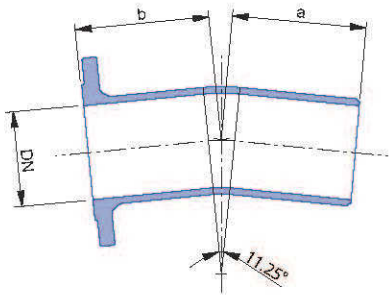
Flange - Spigot Bends 22½°:

DN	Product Code DICL PN16	Dim. (mm) a	Dim. (mm) b
80	C0134.0822	160	152
100	C0134.1022	160	152
150	C0134.1522	176	190
200	C0134.2022	206	203
225	C0134.2222	211	229
250	C0134.2522	216	254
300	C0134.3022	232	305
375	C0134.3722	266	381
450	C0134.4522	294	457
500	C0134.5022	304	508
575	C0134.5222	316	533
600	C0134.6022	350	610
750	C0134.7522	320	295



Flange - Spigot Bends 11¼°:

DN	Product Code DICL PN16	Dim. (mm) a	Dim. (mm) b
80	C0134.0811	150	135
100	C0134.1011	150	152
150	C0134.1511	161	190
200	C0134.2011	185	203
225	C0134.2211	188	229
250	C0134.2511	190	254
300	C0134.3011	201	305
375	C0134.3711	228	381
450	C0134.4511	248	457
500	C0134.5011	254	508
575	C0134.5211	262	533
600	C0134.6011	289	610
750	C0134.7511	245	230

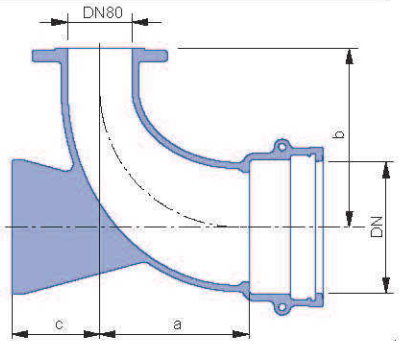


Note:
1. Bends with AS/NZS 4087 PN35 flanges are available on request with suffix 'F'.
2. Bends with Table E flanges to AS 2129 are also available on request with suffix 'E'.
3. All dimensions are in accordance with AS/NZS 2280, where applicable.
4. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket Hydrant Bends:

DN	Product Codes		Dim. (mm) a	Dim. (mm) b	Dim. (mm) c
	Series 2 / DICL PN16	Series 1[2] PN16			
100	C121.100890S[1]	C122.100890S[1]	70	180	76.5
100	C121.100890	C122.100890	205	220	133
150	C121.150890S[1]	C122.150890S[1]	100	195	81.5
150	C121.150890	C122.150890	205	245	133

[1] *Crevet SL® fittings*
[2] *Series 1 fittings fitted with adaptor seal are rated at PN12*



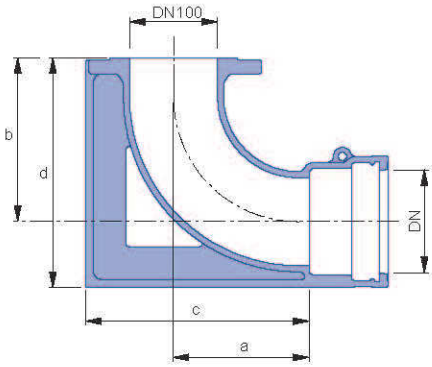
Product Specification

- **Applications** : used at the end of a line for hydrant
- **DN80 Flange** : PN16 AS/NS 4087

Socket Washout Bends:

DN	Product Code Series 2 / DICL PN16	Dim. (mm) a	Dim. (mm) b	Dim. (mm) c	Dim. (mm) d
100	C121.101090S[1]	75	157.5	76.5	-
100	C121.101090	75	195	380	280
150	C121.151090S[1]	102	195.5	81.5	-
150	C121.151090	102	213	280	320

[1] *Crevet SL® fittings*

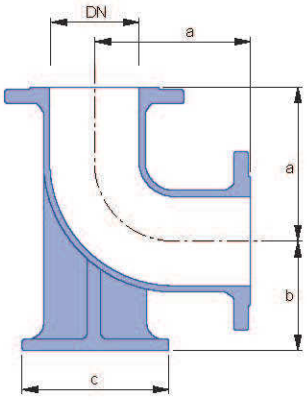


Product Specification

- **Applications** : used at the end of a line for hydrant
- **DN100 Flange** : PN16 AS/NS 4087

Flange Duckfoot Bends:

DN	Product Code PN16 Flange	Dim. (mm) a	Dim. (mm) a	Dim. (mm) a
80	C023.0890	152	133	184
100	C023.1090	241	133	184
150	C023.1590	279	165	190
200	C023.2090	305	197	235
225	C023.2290	330	216	260
250	C023.2590	356	230	290
300	C023.3090	406	260	343
375	C023.3790	495	310	425
450	C023.4590	572	355	500
500	C023.5090	622	395	560
525	C023.5290	622	395	559
600	C023.6090	737	460	660

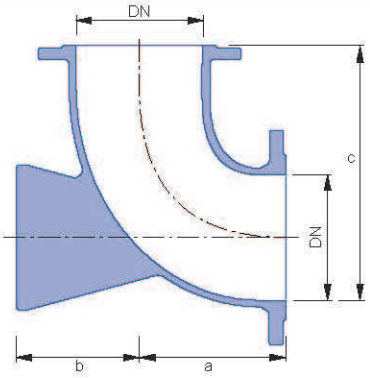


Product Specification

- **Applications** : used in pump stations and water treatment plants

Pedestal Bends:

DN	Product Code PN16 Flange	Dim. (mm) a	Dim. (mm) b	Dim. (mm) c
100	C0203.1090	318	73	318



Product Specification

- **Applications** : used for sewerage pipelines

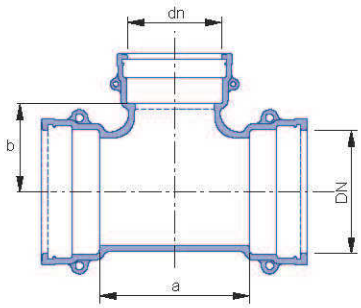
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Fittings with AS/NZS 4087 PN35 flanges are available on request with suffix 'F'. Other flange configurations are also available on request.
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket Tees - DI and Series 2 PVC:

DN	dn	Product Code Series 2 / DICL PN35	Dim. (mm) a	Dim. (mm) b
100	100	C031.1010S[1]	123	79.5
100	100	C031.1010	230	115
150	100	C031.1510S[1]	125	107
150	100	C031.1510	230	145
150	150	C031.1515S[1]	167	107
150	150	C031.1515	290	145
200	100	C031.2010	230	170
200	150	C031.2015	290	170
200	200	C031.2020	340	170
225	100	C031.2210	240	185
225	150	C031.2215	300	185
225	225	C031.2222	380	190
250	100	C031.2510	240	200
250	150	C031.2515	300	200
250	200	C031.2520	350	200
250	225	C031.2522	410	205
300	100	C031.3010	240	230
300	150	C031.3015	300	230
300	200	C031.3020	350	230
300	225	C031.3022	380	235
300	250	C031.3025	410	235
300	300	C031.3030	490	245
375	100	C031.3710	360	270
375	150	C031.3715	360	270
375	200	C031.3720	360	270
375	225	C031.3722	390	275
375	250	C031.3725	420	275
375	300	C031.3730	500	285
375	375	C031.3737	610	305
450	100	C031.4510	420	315
450	150	C031.4515	420	315
450	200	C031.4520	420	315
450	250	C031.4525	420	315
450	300	C031.4530	500	325
450	375	C031.4537	610	345
450	450	C031.4545	690	345
500	100	C031.5010	420	340
500	250	C031.5025	420	340
500	300	C031.5030	500	355
500	375	C031.5037	610	370
500	450	C031.5045	690	370
500	500	C031.5050	770	385
600	100	C031.6010	500	405
600	300	C031.6030	500	405
600	375	C031.6037	610	425
600	450	C031.6045	690	575
600	500	C031.6050	770	435
600	600	C031.6060	870	435
750	500	C031.7550	780	680
750	600	C031.7560	880	695
750	750	C031.7575	1070	535

[1] Crevet SL® Series 2 fittings are rated PN20



Product Specification

- **Applications** : used for branching off a pipeline

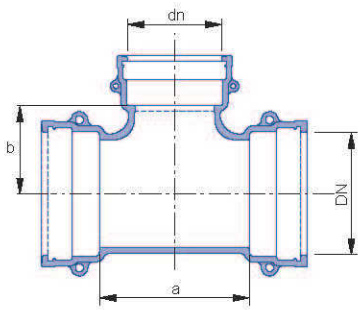
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Standard range DN100& DN150 DI socket fittings in PN35 are made to order only.
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket Tees - Series 1 PVC:

DN	dn	Product Code Series PN16[1]	Dim. (mm) a	Dim. (mm) b
80	80	C032.0808	210	145
100	80	C032.1008	230	115
100	100	C032.1010S[2]	123	79.5
100	100	C032.1010	230	115
150	100	C032.1510S[2]	125	107
150	100	C032.1510	230	145
150	150	C032.1515S[2]	167	107
150	150	C032.1515	290	145
200	100	C032.2010	230	170
200	150	C032.2015	290	170
200	200	C032.2020	340	170
225	100	C032.2210	240	185
225	150	C032.2215	300	185
225	200	C032.2220	350	185
225	225	C032.2222	380	190
250	100	C032.2510	240	200
250	150	C032.2515	300	200
250	200	C032.250	350	200
250	225	C032.2522	380	205
250	250	C032.2525	410	205
300	100	C032.3010	240	230
300	150	C032.3015	300	230
300	200	C032.3020	350	230
300	225	C032.3022	380	235
300	250	C032.3025	410	235
300	300	C032.3030	490	245
375	100	C032.3710	360	270
375	150	C032.3715	360	270
375	200	C032.3720	360	270
375	225	C032.3722	390	275
375	375	C032.3737	610	305

[1] Series 1 fittings fitted with adaptor seal are rated at PN12
[2] Crevet SL® fittings



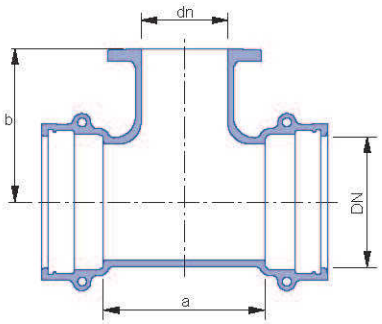
Product Specification

- **Applications** : used for branching off a pipeline

Note:
1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket - Flanged Tees:

DN	dn	Product Codes			Dim. (mm) a	Dim. (mm) b
		Series 2 / DICL PN16	Series 2 / DICL PN35	Series 1[1] PN16		
100	100	C0313.1010S[2]	-	C0323.1010S[2]	123	79.5
100	100	C0313.1010	C0313.1010F	C0323.1010	230	195
150	100	C0313.1510S[2]	-	C0323.1510S[2]	125	107
150	100	C0313.1510	C0313.1510F	C0323.1510	230	225
150	150	C0313.1515S[2]	-	C0323.1515S[2]	167	107
150	150	C0313.1515	C0313.1515F	C0323.1515	290	250
200	100	C0313.2010	C0313.2010F	C0323.2010	230	250
200	150	C0313.2015S[2]	-	C0323.2015S[2]	121	218
200	150	C0313.2015	C0313.2015F	C0323.2015	290	275
200	200	C0313.2020	C0313.2020F	C0323.2020	340	275
225	100	C0313.2210S[2]	-	C0323.2210S[2]	121	228
225	100	C0313.2210	C0313.2210F	C0323.2210	240	265
225	200	C0313.2220	C0313.2220F	C0323.2220	350	290
225	225	C0313.2222	C0313.2222F	C0323.2222	380	305
250	100	C0313.2510S[2]	-	C0323.2510S[2]	121	232
250	100	C0313.2510	C0313.2510F	C0323.2510	240	280
250	150	C0313.2515	C0313.2515F	C0323.2515	300	305
250	200	C0313.2520	C0313.2520F	C0323.2520	350	305
250	225	C0313.2522	C0313.2522F	C0323.2522	380	320
250	250	C0313.2525	C0313.2525F	C0323.2525	410	320
300	100	C0313.3010S[2]	-	C0323.3010S[2]	123	282
300	100	C0313.3010	C0313.3010F	C0323.3010	240	310
300	150	C0313.3015	C0313.3015F	C0323.3015	300	335
300	200	C0313.3020	C0313.3020F	C0323.3020	350	335
300	225	C0313.3022	C0313.3022F	C0323.3022	380	350
300	250	C0313.3025	C0313.3025F	C0323.3025	410	350
300	300	C0313.3030	C0313.3030F	C0323.3030	490	375
375	100	C0313.3710	C0313.3710F	C0323.3710	250	350
375	150	C0313.3715	C0313.3715F	C0323.3715	360	375
375	200	C0313.3720	C0313.3720F	C0323.3720	360	375
375	225	C0313.3722	C0313.3722F	C0323.3722	390	390
375	250	C0313.3725	C0313.3725F	C0323.3725	420	390
375	300	C0313.3730	C0313.3730F	C0323.3730	500	415
375	375	C0313.3737	C0313.3737F	C0323.3737	610	415
450	100	C0313.4510	C0313.4510F	-	250	390
450	150	C0313.4515	C0313.4515F	-	420	430
450	250	C0313.4525	C0313.4525F	-	420	430
450	300	C0313.4530	C0313.4530F	-	500	455
450	375	C0313.4537	C0313.4537F	-	610	482
450	450	C0313.4545	C0313.4545F	-	690	495
500	100	C0313.5010	C0313.5010F	-	250	415
500	250	C0313.5025	C0313.5025F	-	420	455
500	300	C0313.5030	C0313.5030F	-	500	485
500	375	C0313.5037	C0313.5037F	-	610	510
500	450	C0313.5045	C0313.5045F	-	690	520
500	500	C0313.5050	C0313.5050F	-	770	550
600	100	C0313.6010	C0313.6010F	-	250	470
600	300	C0313.6030	C0313.6030F	-	500	535
600	375	C0313.6037	C0313.6037F	-	610	565
600	450	C0313.6045	C0313.6045F	-	690	575
600	500	C0313.6050	C0313.6050F	-	770	600
600	600	C0313.6060	C0313.6060F	-	870	615
750	300	C0313.7530	C0313.7530F	-	510	615
750	375	C0313.7537	C0313.7537F	-	620	645
750	450	C0313.7545	C0313.7545F	-	700	655
750	500	C0313.7550	C0313.7550F	-	780	680
750	600	C0313.7560	C0313.7560F	-	880	695
750	750	C0313.7575	C0313.7575F	-	1070	725



Product Specification

- **Applications** : used for branching off a pipeline
- **dn Flanges** : PN16 AS/NZS 4087
  PN35 AS/NZS 4087
- **Installation** : Guidelines for Flanged Joints can be found on page 96-97

[1] Series 1 fittings fitted with adaptor seal are rated at PN12
[2] Crevet SL® fittings

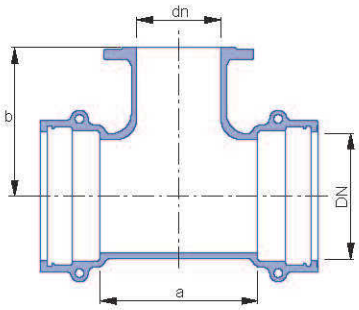
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Socket - Flange tee with Table E flange to AS 2129 is available on request with suffix "E". Other flange configurations are also available on request.
2. Standard range DN100& DN150 DI socket fittings in PN35 are made to order only.
3. All dimensions are in accordance with AS/NZS 2280, where applicable.
4. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket - Flange Hydrant Tees:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b
		Series 2 / DICL PN16	Series 1[1] PN16		
80	80	-	C112.0808	160	210
100	80	C111.1008S[2]	C112.1008S[2]	98	147
100	80	C111.1008	C112.1008	195	210
150	80	C111.1508S[2]	C112.1508S[2]	98	175
150	80	C111.1508	C112.1508	225	210
200	80	C111.2008S[2]	C112.2008S[2]	108	214
200	80	C111.2008	C112.2008	250	210
225	80	C111.2258S[2]	C112.2258S[2]	108	227
225	80	C111.2258	C112.2258	265	220
250	80	C111.2508S[2]	C112.2508S[2]	108	241
250	80	C111.2508	C112.2508	280	220
300	80	C111.3008S[2]	C112.3008S[2]	110	272
300	80	C111.3008	C112.3008	310	220
375	80	C111.3708	C112.3708	350	230
450	80	C111.4508	-	390	230

[1] Series 1 fittings fitted with adaptor seal are rated at PN12
[2] Crevet SL® fittings

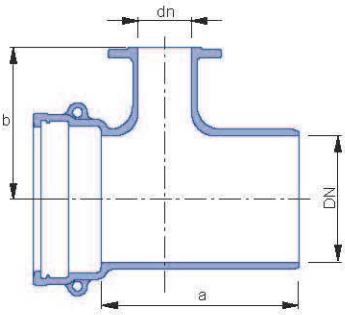


Product Specification

- **Applications** : used for hydrant take offs
- **DN Flanges** : PN16 AS/NZS 4087
- WA Hydrant tees have a 100mm dia flanged offtake

Socket - Spigot - Flange Hydrant Tees:

DN	dn	Product Code Series 2/ DICL PN16	Dim. (mm) a	Dim. (mm) b
100	80	C1114.1008	195	310
100	100	C1114.1010	195	335
150	80	C1114.1508	225	310
150	100	C1114.1510	225	335
200	80	C1114.2008	250	325
200	100	C1114.2010	250	345
225	80	C1114.2208	265	330
225	100	C1114.2210	265	350
250	80	C1114.2508	280	330
250	100	C1114.2510	280	350
300	80	C1114.3008	310	330
300	100	C1114.3010	310	350
375	80	C1114.3708	350	360
375	100	C1114.3710	350	380
450	80	C1114.4508	390	360
450	100	C1114.4510	390	380
500	80	C1114.5008	415	360
500	100	C1114.5010	415	380
600	80	C1114.6008	470	360
600	100	C1114.6010	470	380

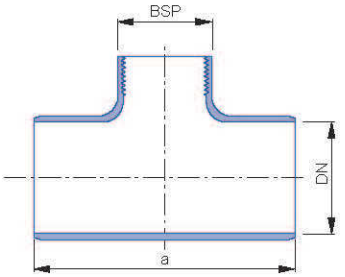


Product Specification

- **Applications** : used for hydrant take offs
- **dn Flanges** : PN16 AS/NZS 4087

BSP Tapped Irrigation Tees:

DN	Tapping BSP (mm)	Product Code Spigot Tee	Dim. (mm) a	Product Code Series 2 / DICL	Dim. (mm) a	Product Code Series 1	Dim. (mm) a
100	100	C054.10100B	324	-	-	C052.10100B	275
150	100	C054.15100B	349	C051.15100B	210	C052.15100B	275
150	125	C054.15125B	349	C051.15125B	175	C052.15125B	340
200	100	C054.20100B	375	-	-	C052.20100B	360
200	125	C054.20125B	375	-	-	C052.20125B	360



Product Specification

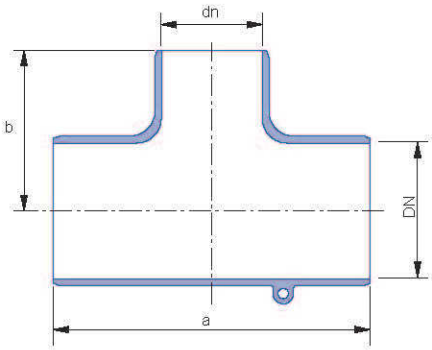
- **Applications** : used for irrigation heads
- 3" BSP also available upon request

Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Tees with AS/NZS 4087 PN35 flanges available on request with suffix "F". Other flange configurations are also available on request.
2. For hydrants with a DN 100 flange branch, refer to the socket-flange tee range.
3. All dimensions are in accordance with AS/NZS 2280, where applicable.
4. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Spigot Tees:

DN	dn	Product Code DICL PN35	Dim. (mm) a	Dim. (mm) b
80	80	C034.0808	330	168
100	80	C034.1008	380	190
100	100	C034.1010	380	190
150	80	C034.1508	432	216
150	100	C034.1510	432	216
150	150	C034.1515	432	216
200	100	C034.2010	482	241
200	150	C034.2015	482	241
200	200	C034.2020	534	254
225	80	C034.2208	508	254
225	100	C034.2210	508	254
225	150	C034.2215	508	254
225	200	C034.2220	534	267
225	225	C034.2222	558	267
250	80	C034.2508	534	267
250	100	C034.2510	534	267
250	150	C034.2515	534	267
250	200	C034.2520	558	279
250	225	C034.2522	558	279
250	250	C034.2525	610	279
300	80	C034.3008	610	305
300	100	C034.3010	610	305
300	150	C034.3015	610	305
300	200	C034.3020	636	318
300	225	C034.3022	636	318
300	250	C034.3025	636	318
300	300	C034.3030	660	318
375	100	C034.3710	712	356
375	150	C034.3715	712	356
375	200	C034.3720	736	368
375	225	C034.3722	736	368
375	250	C034.3725	736	368
375	300	C034.3730	736	368
375	375	C034.3737	812	394
450	100	C034.4510	788	394
450	150	C034.4515	788	394
450	200	C034.4520	812	406
450	225	C034.4522	812	406
450	250	C034.4525	812	406
450	300	C034.4530	812	406
450	375	C034.4537	864	432
450	450	C034.4545	888	432
500	100	C034.5010	888	444
500	150	C034.5015	888	444
500	200	C034.5020	914	457
500	225	C034.5022	914	457
500	250	C034.5025	888	444
500	300	C034.5030	888	444
500	375	C034.5037	940	470
500	450	C034.5045	940	470
500	500	C034.5050	940	470
525	100	C034.5210	888	444
525	150	C034.5215	888	444
525	200	C034.5220	888	444
525	225	C034.5222	914	457
525	250	C034.5225	914	457
525	300	C034.5230	914	457
525	375	C034.5237	914	483
525	450	C034.5245	966	483
525	525	C034.5252	966	483
600	100	C034.6010	966	483
600	150	C034.6015	966	483
600	200	C034.6020	990	495
600	225	C034.6022	990	495
600	250	C034.6025	990	495
600	300	C034.6030	990	495
600	375	C034.6037	1042	521
600	450	C034.6045	1042	521
600	500	C034.6050	1042	521
600	600	C034.6060	1042	521
750	375	C034.7537	900	620
750	450	C034.7545	980	620
750	600	C034.7560	1160	630
750	750	C034.7575	1350	675



Product Specification

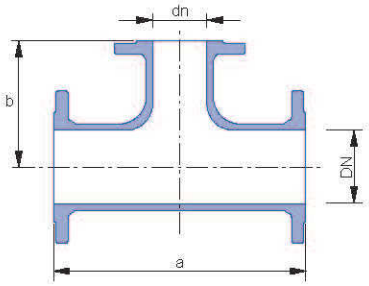
- **Applications** : used for branching off a pipeline

Note:

1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Flange Tees:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b
		Flanged PN16	Flanged PN35		
80	80	C033.0808	C033.0808F	329	164
100	50	C033.1005	C033.1005F	356	179
100	58	C033.10058	C033.10058F	356	179
100	80	C033.1008	C033.1008F	356	179
100	100	C033.1010	C033.1010F	356	179
150	100	C033.1510	C033.1510F	406	203
150	150	C033.1515	C033.1515F	406	203
200	80	C033.2008	C033.2008F	484	239
200	100	C033.2010	C033.2010F	484	241
200	150	C033.2015	C033.2015F	484	241
200	200	C033.2020	C033.2020F	484	241
225	80	C033.2208	C033.2208F	508	254
225	100	C033.2210	C033.2210F	508	254
225	150	C033.2215	C033.2215F	508	254
225	200	C033.2220	C033.2220F	508	254
225	225	C033.2222	C033.2222F	508	254
250	80	C033.2508	C033.2508F	534	267
250	100	C033.2510	C033.2510F	534	267
250	150	C033.2515	C033.2515F	534	267
250	200	C033.2520	C033.2520F	534	267
250	225	C033.2522	C033.2522F	534	267
250	250	C033.2525	C033.2525F	534	267
300	80	C033.3008	C033.3008F	607	304
300	100	C033.3010	C033.3010F	610	305
300	150	C033.3015	C033.3015F	610	305
300	200	C033.3020	C033.3020F	610	305
300	225	C033.3022	C033.3022F	610	305
300	250	C033.3025	C033.3025F	610	305
300	300	C033.3030	C033.3030F	610	305
375	100	C033.3710	C033.3710F	738	343
375	150	C033.3715	C033.3715F	738	343
375	200	C033.3720	C033.3720F	738	356
375	225	C033.3722	C033.3722F	738	356
375	250	C033.3725	C033.3725F	738	356
375	300	C033.3730	C033.3730F	738	356
375	375	C033.3737	C033.3737F	738	368
450	100	C033.4510	C033.4510F	814	381
450	150	C033.4515	C033.4515F	814	381
450	200	C033.4520	C033.4520F	814	394
450	250	C033.4525	C033.4525F	814	394
450	300	C033.4530	C033.4530F	814	394
450	375	C033.4537	C033.4537F	814	406
450	450	C033.4545	C033.4545F	814	406
500	100	C033.5010	C033.5010F	890	419
500	150	C033.5015	C033.5015F	890	419
500	200	C033.5020	C033.5020F	890	432
500	225	C033.5022	C033.5022F	890	432
500	250	C033.5025	C033.5025F	890	432
500	300	C033.5030	C033.5030F	890	432
500	375	C033.5037	C033.5037F	890	444
500	450	C033.5045	C033.5045F	890	444
500	500	C033.5050	C033.5050F	890	444
600	100	C033.6010	C033.6010F	1016	470
600	150	C033.6015	C033.6015F	1016	470
600	200	C033.6020	C033.6020F	1016	483
600	225	C033.6022	C033.6022F	1016	483
600	250	C033.6025	C033.6025F	1016	483
600	300	C033.6030	C033.6030F	1016	483
600	375	C033.6037	C033.6037F	1016	495
600	450	C033.6045	C033.6045F	1016	495
600	500	C033.6050	C033.6050F	1016	495
600	525	C033.6052	C033.6052F	1016	495
600	600	C033.6060	C033.6060F	1016	508
750	250	C033.7525	-	890	590
750	375	C033.7537	C033.7537F	1000	645
750	450	C033.7545	C033.7545F	1080	655
750	500	C033.7550	-	1160	680
750	600	C033.7560	C033.7560F	1260	695
750	750	C033.7575	C033.7575F	1450	725



Product Specification

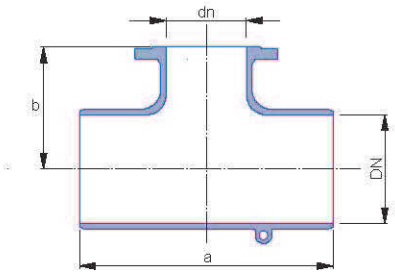
- **Applications** : used for branching off a pipeline
- **DN & dn Flanges** : PN16 AS/NZS 4087
  PN35 AS/NZS 4087
- **Installation** : Guidelines for Flanged Joints can be found on page 96-97

Note:

1 Flanged tees with Table "E" flanges to AS 2129 flanges are available on request with suffix "E". Other flange configurations are also available on request.
2 All dimensions are in accordance with AS/NZS 2280, where applicable .
3 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in
4 millimetres, of the bore or outside diameter of the end connections.

Spigot - Flange Tees:

DN	dn	Product Code DICL PN16	Dim. (mm) a	Dim. (mm) b
80	80	C0343.0808	381	130
100	80	C0343.1008	432	178
100	100	C0343.1010	432	178
150	80	C0343.1508	432	203
150	100	C0343.1510	432	203
150	150	C0343.1515	432	203
200	80	C0343.2008	457	241
200	100	C0343.2010	457	241
200	150	C0343.2015	482	241
200	200	C0343.2020	534	241
225	80	C0343.2208	457	254
225	100	C0343.2210	457	254
225	150	C0343.2215	508	254
225	200	C0343.2220	534	254
225	225	C0343.2222	558	254
250	80	C0343.2508	457	267
250	100	C0343.2510	457	267
250	150	C0343.2515	534	267
250	200	C0343.2520	558	267
250	225	C0343.2522	558	267
250	250	C0343.2525	610	267
300	80	C0343.3008	457	305
300	100	C0343.3010	457	305
300	150	C0343.3015	610	305
300	200	C0343.3020	636	305
300	225	C0343.3022	636	305
300	250	C0343.3025	636	305
300	300	C0343.3030	660	305
375	80	C0343.3708	559	309
375	100	C0343.3710	712	343
375	150	C0343.3715	712	343
375	200	C0343.3720	736	356
375	225	C0343.3722	736	356
375	250	C0343.3725	736	356
375	300	C0343.3730	736	356
375	375	C0343.3737	812	368
450	80	C0343.4508	559	343
450	100	C0343.4510	788	381
450	150	C0343.4515	788	381
450	200	C0343.4520	812	394
450	225	C0343.4522	812	394
450	250	C0343.4525	812	394
450	300	C0343.4530	812	394
450	375	C0343.4537	864	406
450	450	C0343.4545	888	406
500	100	C0343.5010	564	381
500	150	C0343.5015	600	390
500	200	C0343.5020	888	410
500	225	C0343.5022	888	420
500	250	C0343.5025	888	432
500	300	C0343.5030	888	432
500	375	C0343.5037	940	444
500	450	C0343.5045	940	444
500	500	C0343.5050	940	444
600	100	C0343.6010	966	470
600	150	C0343.6015	966	470
600	200	C0343.6020	990	483
600	225	C0343.6022	990	483
600	250	C0343.6025	990	483
600	300	C0343.6030	990	483
600	375	C0343.6037	1042	495
600	450	C0343.6045	1042	495
600	525	C0343.6052	1042	495
600	600	C0343.6060	1042	508
750	750	C0343.7575	1355	725



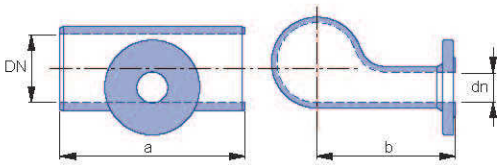
Product Specification

- **Applications** : used for cutting a tee into pipeline (with the use of gibaults)
- **dn Flanges** : PN16 AS/NZS 4087
- **Installation** : Guidelines for Flanged Joints can be found on page 96-97

Note:
1. Spigot - Flange tees with AS/NZS 4087 PN35 flanges are available on request with suffix "F" and Table "E" to AS 2129 flanges with suffix "E".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Spigot - Flange Scour Tees:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b
		DICL PN16	DICL PN35		
100	80	C0443.1008	C0443.1008F	432	203
150	80	C0443.1508	C0443.1508F	432	203
150	100	C0443.1510	C0443.1510F	432	203
200	80	C0443.2008	C0443.2008F	458	241
200	100	C0443.2010	C0443.2010F	458	251
200	150	C0443.2015	C0443.2015F	458	254
225	80	C0443.2208	C0443.2208F	458	254
225	100	C0443.2210	C0443.2210F	458	254
225	150	C0443.2215	C0443.2215F	458	267
250	80	C0443.2508	C0443.2508F	458	267
250	100	C0443.2510	C0443.2510F	458	267
250	150	C0443.2515	C0443.2515F	458	267
300	80	C0443.3008	C0443.3008F	458	305
300	100	C0443.3010	C0443.3010F	458	305
300	150	C0443.3015	C0443.3015F	458	305
375	80	C0443.3708	C0443.3708F	558	343
375	100	C0443.3710	C0443.3710F	558	343
375	150	C0443.3715	C0443.3715F	558	343
450	100	C0443.4510	C0443.4510F	558	381
450	150	C0443.4515	C0443.4515F	558	381
525	100	C0443.5210	C0443.5210F	584	432
525	150	C0443.5215	C0443.5215F	584	432
600	100	C0443.6010	C0443.6010F	584	470
600	150	C0443.6015	C0443.6015F	584	470
750	150	C0443.7515	C0443.7515F	640	550

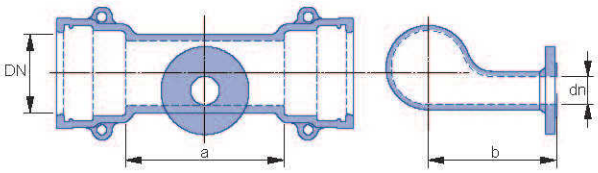


Product Specification

- **Applications** : used for scouring of the lowest point of a pipeline
- **dn Flanges** : PN16 AS/NZS 4087
  PN35 AS/NZS 4087

Socket - Flange Scour Tees Series 2:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b
		Series 2 / DICL PN16	Series 2 / DICL PN35		
100	80	C0413.1008	C0413.1008F	210	195
150	80	C0413.1508	C0413.1508F	225	210
150	100	C0413.1510	C0413.1510F	230	195
200	80	C0413.2008	C0413.2008F	250	210
200	100	C0413.2010	C0413.2010F	230	250
225	100	C0413.2210	C0413.2210F	265	240
250	100	C0413.2510	C0413.2510F	280	240
300	100	C0413.3010	C0413.3010F	310	240
375	150	C0413.3715	C0413.3715F	375	310
450	150	C0413.4515	C0413.4515F	415	310
500	150	C0413.5015	C0413.5015F	440	310
600	150	C0413.6015	C0413.6015F	495	310
750	150	C0413.7515	C0413.7515F	515	370
750	200	C0413.7520	C0413.7520F	575	370



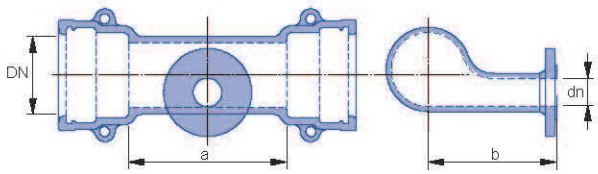
Product Specification

- **Applications** : used for scouring of the lowest point of a pipeline
- **dn Flanges** : PN16 AS/NZS 4087
  PN35 AS/NZS 4087

Socket - Flange Scour Tees Series 1:

DN	dn	Product Code Series 1[1] PN16	Dim. (mm) a	Dim. (mm) b
100	80	C0423.1008	210	195
150	80	C0423.1508	225	210
150	100	C0423.1510	230	195
200	80	C0423.2008	250	210
200	100	C0423.2010	230	250
225	100	C0423.2210	265	240
250	100	C0423.2510	280	240
300	100	C0423.3010	310	240
375	150	C0423.3715	375	310

[1] Series 1 fittings fitted with adaptor seal are rated at PN12



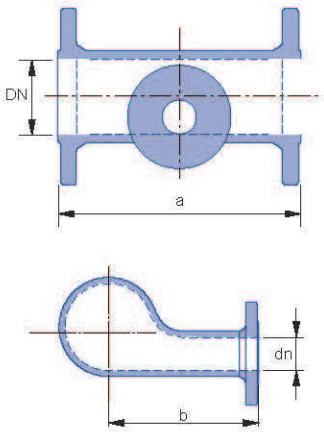
Product Specification

- **Applications** : used for scouring of the lowest point of a pipeline
- **dn Flanges** : PN16 AS/NZS 4087
  PN35 AS/NZS 4087

Note:
1. Scour tees with Table "E" flanges to AS 2129 are available on request with suffix "E".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Flange Scour Tees:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b
		PN16	PN35		
100	80	C043.1008	C043.1008F	432	203
150	80	C043.1508	C043.1508F	432	203
150	100	C043.1510	C043.1510F	432	203
200	80	C043.2008	C043.2008F	458	241
200	100	C043.2010	C043.2010F	458	251
200	150	C043.2015	C043.2015F	458	254
225	80	C043.2208	C043.2208F	458	254
225	100	C043.2210	C043.2210F	458	254
225	150	C043.2215	C043.2215F	458	267
250	80	C043.2508	C043.2508F	458	267
250	100	C043.2510	C043.2510F	458	267
250	150	C043.2515	C043.2515F	458	267
300	80	C043.3008	C043.3008F	458	305
300	100	C043.3010	C043.3010F	458	305
300	150	C043.3015	C043.3015F	458	305
375	80	C043.3708	C043.3708F	558	-
375	100	C043.3710	C043.3710F	558	343
375	150	C043.3715	C043.3715F	558	343
450	100	C043.4510	C043.4510F	558	381
450	150	C043.4515	C043.4515F	558	381
500	150	C043.5015	C043.5015F	432	430
525	100	C043.5210	C043.5210F	584	432
525	150	C043.5215	C043.5215F	584	432
600	100	C043.6010	C043.6010F	584	470
600	150	C043.6015	C043.6015F	584	470
750	150	C043.7515	C043.7515F	640	550

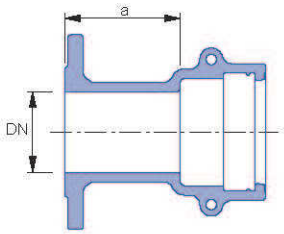


Product Specification

- **DN & dn Flanges** : PN16 AS/NZS 4087
  PN35 AS/NZS 4087

Flange - Socket Connectors:

DN	Product Codes			Dim. (mm) a
	Series 2 / DICL PN16	Series 2 / DICL PN35	Series 1[1] PN16	
80	C1013.08	C1013.08F	C1023.08	170
100	C1013.10S[2]	-	C1023.10S[2]	105
100	C1013.10	C1013.10F	C1023.10	110
150	C1013.15S[2]	-	C1023.15S[2]	105
150	C1013.15	C1013.15F	C1023.15	135
200	C1013.20S[2]	-	-	125
200	C1013.20	C1013.20F	C1023.20	135
225	C1013.22S[2]	-	-	125
225	C1013.22	C1013.22F	C1023.22	155
250	C1013.25S[2]	-	-	135
250	C1013.25	C1013.25F	C1023.25	155
300	C1013.30S[2]	-	-	170
300	C1013.30	C1013.30F	C1023.30	170
375	C1013.37	C1013.37F	C1023.37	190
450	C1013.45	C1013.45F	-	200
500	C1013.50	C1013.50F	-	215
575	C1013.57	C1013.57F	-	330
600	C1013.60	C1013.60F	-	230
750	C1013.75	C1013.75F	-	250



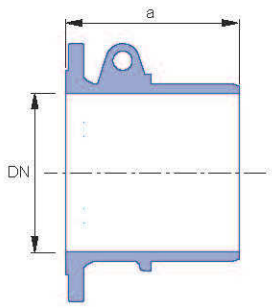
[1] Series 1 fittings fitted with adaptor seal are rated at PN12
[2] Crevet SL® fittings

Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Fitting with Table "E" flanges to AS 2129 are available on request with suffix "E".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Flange - Spigot Connectors:

DN	Product Code PN16 DICL	Dim. (mm) a
80	C1034.08	205
100	C1034.10	205
150	C1034.15	205
200	C1034.20	230
225	C1034.22	230
250	C1034.25	230
300	C1034.30	255
375	C1034.37	280
450	C1034.45	280
500	C1034.50	305
525	C1034.52	305
600	C1034.60	330
750	C1034.75	370

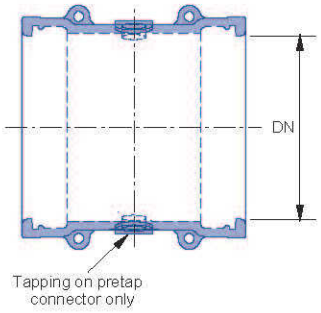


Product Specification

- **Application** : to connect to a pipe or fitting
- **DN Flanges** : PN16 AS/NZS 4087

Socket - Socket Connectors, Pretap Connectors & Socket Slip Couplings:

DN	Product Codes					
	Connector Series 2 /DICL	Connector Series 1[2]	Adaptor Series 1 to Series 2 /DICL	Pretap Connector 4 tap Series 2 /DICL	Pretap Connector 2 tap Series 2 /DICL	Socket Slip Coupling Series 2 /DICL
80	C101.08	C102.08	C1012.08	-	-	-
100	C101.10S[1]	C102.10S[1]	-	-	C1011.10020VS[1]	-
100	C101.10	C102.10	C1012.10	C1011.10020 C1011.10025	C1011.10020V	C150.10S
150	C101.15S[1]	C102.15S[1]	-	-	C1011.15020VS[1]	-
150	C101.15	C102.15	C1012.15	C1011.15020 C1011.15025	C1011.15020V	C150.15S
200	C101.20	C102.20	C1012.20	-	-	-
225	C101.22	C102.22	C1012.22	-	-	-
250	C101.25	C102.25	C1012.25	-	-	-
300	C101.30	C102.30	C1012.30	-	-	-
375	C101.37	C102.37	C1012.37	-	-	-
450	C101.45	-	-	-	-	-
500	C101.50	-	-	-	-	-
600	C101.60	-	-	-	-	-
750	C101.75	-	-	-	-	-



Product Specification

- Tappings are available (1/2" to 2" BSP) on request only.

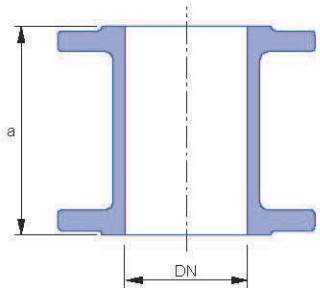
[1] Crevet SL® fittings are rated at PN20
[2] Series 1 fittings fitted with adaptor seal are rated at PN12

Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Pretap Connectors come standard with polymeric coatings (eg. C1011.1020 (20mm) & C1011.1025 (25mm) configurations). Other tappings are available on request. Pretap connectors have two tappings (AS1722.1 RP) 150° apart.
2. Flanged fittings with AS/NZS 4087 PN35 flanges are available on request with suffix "F".
3. Flanged fittings with Table 'E' AS/NZS 2129 with suffix 'E'.
4. All dimensions are in accordance with AS/NZS 2280, where applicable.
5. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Hydrant Risers:

DN	Product Code PN16	Dim. (mm) a
80	C13.0810	100
80	C13.0815	150
80	C13.0822	225
80	C13.0830	300
80	C13.0837	375
80	C13.0845	450
80	C13.0852	525
80	C13.0860	600
80	C13.08100	1000
100	C13.1010	100
100	C13.1015	150
100	C13.1022	225
100	C13.1030	300
100	C13.1037	375
100	C13.1045	450
100	C13.1052	525
100	C13.1060	600
100	C13.10100	1000

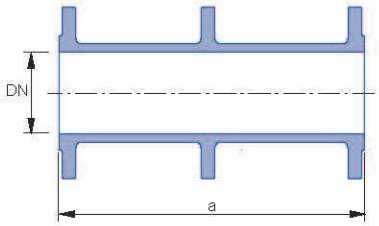


Product Specification

- **Application** : used to raise the height of a hydrant
- Tappings are available (DN20 - DN50) on request only

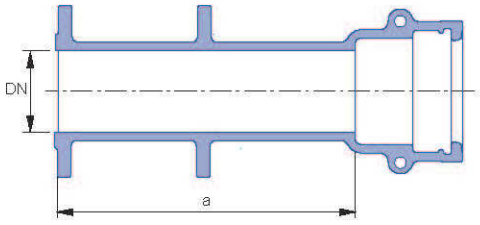
Flange Connectors with Puddle Flange:

DN	Product Code PN16	Dim. (mm) a
100	C1033.1060W	600
150	C1033.1560W	600
225	C1033.22915W	915
300	C1033.30915W	915
375	C1033.3791W	915
450	C1033.4591W	915



Flange - Socket Connectors with Puddle Flange:

DN	Product Code PN16	Dim. (mm) a
100	C10131.10	915
100	C1013.1060W	600
150	C10131.15	915
150	C1013.1560W	600
225	C10131.22	915
300	C10131.30	915
375	C10131.37	915
450	C10131.45	915
500	C10131.50	915
575	C10131.57	915



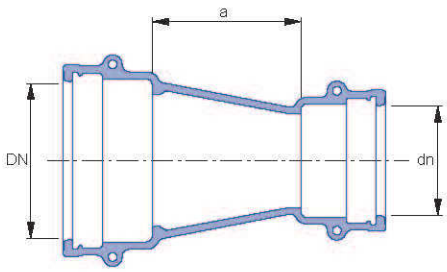
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Flanged fittings with AS/NZS 4087 PN35 flanges are available on request with suffix "F".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Socket Tapers:

DN	dn	Product Codes		Dim. (mm) a
		Series 2 / DICL PN35	Series 1[1] PN16	
100	80	C061.1008	C062.1008	105
150	80	C061.1508	C062.1508	230
150	100	C061.1510	C062.1510	170
200	100	C061.2010	C062.2010	295
200	150	C061.2015	C062.2015	170
225	100	C061.2210	C062.2210	365
225	150	C061.2215	C062.2215	235
225	200	C061.2220	C062.2220	110
250	100	C061.2510	C062.2510	425
250	150	C061.2515	C062.2515	300
250	200	C061.2520	C062.2520	175
250	225	C061.2522	C062.2522	240
300	100	C061.3010	C062.3010	555
300	150	C061.3015	C062.3015	425
300	200	C061.3020	C062.3020	300
300	225	C061.3022	C062.3022	240
300	250	C061.3025	C062.3025	180
375	200	C061.3720	C062.3720	495
375	225	C061.3722	-	435
375	250	C061.3725	C062.3725	375
375	300	C061.3730	C062.3730	245
450	250	C061.4525	-	565
450	300	C061.4530	-	435
450	375	C061.4537	-	250
500	250	C061.5025	-	690
500	300	C061.5030	-	565
500	375	C061.5037	-	380
500	450	C061.5045	-	190
600	375	C061.6037	-	635
600	450	C061.6045	-	440
600	500	C061.6050	-	315
750	600	C061.7560	-	445

[1] Series 1 fittings fitted with adaptor seal are rated at PN12



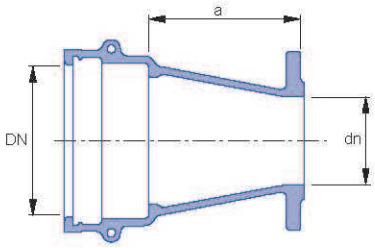
Product Specification

- **Application** : used to reduce a pipeline

Socket - Flange Tapers:

DN	dn	Product Codes			Dim. (mm) a
		Series 2 / DICL PN16	Series 2 / DICL PN35	Series 1[1] PN16	
100	80	C0613.1008	C0613.1008F	C0623.1008	125
150	80	C0613.1508	C0613.1508F	C0623.1508	250
150	100	C0613.1510	C0613.1510F	C0623.1510	190
200	100	C0613.2010	C0613.2010F	C0623.2010	315
200	150	C0613.2015	C0613.2015F	C0623.2015	200
225	100	C0613.2210	C0613.2210F	C0623.2210	385
225	150	C0613.2215	C0613.2215F	C0623.2215	270
225	200	C0613.2220	C0613.2220F	C0623.2220	155
250	100	C0613.2510	C0613.2510F	C0623.2510	445
250	150	C0613.2515	C0613.2515F	C0623.2515	330
250	200	C0613.2520	C0613.2520F	C0623.2520	215
250	225	C0613.2522	C0613.2522F	C0623.2522	160
300	225	C0613.3010	C0613.3010F	C0623.3010	575
300	100	C0613.3015	C0613.3015F	C0623.3015	460
300	150	C0613.3020	C0613.3020F	C0623.3020	345
300	200	C0613.3022	C0613.3022F	C0623.3022	290
300	250	C0613.3025	C0613.3025F	C0623.3025	225
375	200	C0613.3720	C0613.3720F	-	540
375	225	C0613.3722	C0613.3722F	-	485
375	250	C0613.3725	C0613.3725F	C0623.3725	420
375	300	C0613.3730	C0613.3730F	C0623.3730	305
450	250	C0613.4525	C0613.4525F	-	610
450	300	C0613.4530	C0613.4530F	-	495
450	375	C0613.4537	C0613.4537F	-	310
500	250	C0613.5025	C0613.5025F	-	740
500	300	C0613.5030	C0613.5030F	-	620
500	375	C0613.5037	C0613.5037F	-	440
500	450	C0613.5045	C0613.5045F	-	255
600	300	C0613.6030	C0613.6030F	-	875
600	375	C0613.6037	C0613.6037F	-	690
600	450	C0613.6045	C0613.6045F	-	510
600	500	C0613.6050	C0613.6050F	-	400
750	375	C0613.7537	C0613.7537F	-	1080
750	450	C0613.7545	C0613.7545F	-	895
750	500	C0613.7550	C0613.7550F	-	785
750	600	C0613.7560	C0613.7560F	-	540

[1] Series 1 fittings fitted with adaptor seal are rated at PN12



Product Specification

- **Application** : used to reduce a pipeline
- **dn Flanges** : PN16 AS/NZS 4087
  : PN35 AS/NZS 4087

Adaptor seals:
Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:

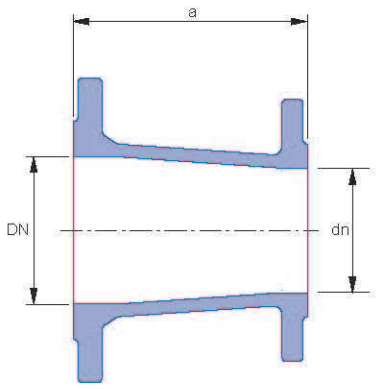
1 Tapers with AS/NZS 4087 PN35 flanges available on request with suffix "F" and Table "E" flanges to AS 2129 with suffix "E".

2 All dimensions are in accordance with AS/NZS 2280, where applicable.

3 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Flange Tapers:

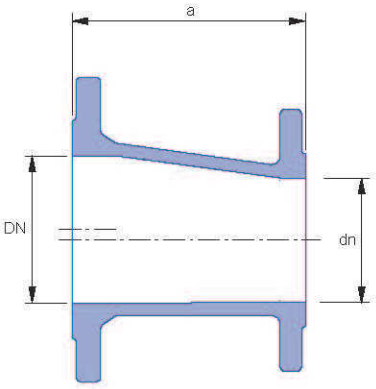
DN	dn	Product Codes			Dim. (mm) a
		Concentric PN16	Concentric PN35	Eccentric PN16	
80	50	C063.0805	CC063.0805F	-	170
80	58	-	-	C073.08058	152
100	50	C063.1005	C063.1005F	C073.1005	178
100	58	C063.10058	C063.10058F	-	230
100	65	C063.1006	C063.1006F	C073.1006	169
100	80	C063.1008	C063.1008F	C073.1008	165
100	125	C063.1012	C063.1012F	-	164
150	50	C063.1505	C063.1505F	-	297
150	80	C063.1508	C063.1508F	C073.1508	298
150	125	C063.1512	C063.1512F	C073.1512	266
150	100	C063.1510	C063.1510F	C073.1510	235
200	80	C063.2008	C063.2008F	-	353
200	100	C063.2010	C063.2010F	C073.2010	368
200	150	C063.2015	C063.2015F	C073.2015	248
225	100	C063.2210	C063.2210F	C073.2210	432
225	150	C063.2215	C063.2215F	C073.2215	311
225	200	C063.2220	C063.2220F	C073.2220	190
250	100	C063.2510	C063.2510F	C073.2510	495
250	150	C063.2515	C063.2515F	C073.2515	375
250	200	C063.2520	C063.2520F	C073.2520	254
250	225	C063.2522	C063.2522F	C073.2522	190
300	100	C063.3010	C063.3010F	C073.3010	629
300	150	C063.3015	C063.3015F	C073.3015	508
300	200	C063.3020	C063.3020F	C073.3020	387
300	225	C063.3022	C063.3022F	C073.3022	324
300	250	C063.3025	C063.3025F	C073.3025	260
375	150	C063.3715	C063.3715F	C073.3715	705
375	200	C063.3720	C063.3720F	C073.3720	584
375	225	C063.3722	C063.3722F	C073.3722	521
375	250	C063.3725	C063.3725F	C073.3725	457
375	300	C063.3730	C063.3730F	C073.3730	337
450	150	C063.4515	C063.4515F	C073.4515	908
450	250	C063.4525	C063.4525F	C073.4525	660
450	300	C063.4530	C063.4530F	C073.4530	540
450	375	C063.4537	C063.4537F	C073.4537	356
500	300	C063.5030	C063.5030F	C073.5030	667
500	375	C063.5037	C063.5037F	C073.5037	483
500	450	C063.5045	C063.5045F	C073.5045	305
525	250	C063.5225	C063.5225F	C073.5225	857
525	300	C063.5230	C063.5230F	C073.5230	737
525	375	C063.5237	C063.5237F	C073.5237	552
525	450	C063.5245	C063.5245F	C073.5245	375
525	500	C063.5250	C063.5250F	C073.5250	248
600	200	C063.6020	C063.6020F	-	1181
600	225	C063.6022	C063.6022F	-	1118
600	250	C063.6025	C063.6025F	-	1054
600	300	C063.6030	C063.6030F	C073.6030	934
600	375	C063.6037	C063.6037F	C073.6037	749
600	450	C063.6045	C063.6045F	C073.6045	572
600	500	C063.6050	C063.6050F	C073.6050	444
600	520	C063.6052	C063.6052F	C073.6052	387
750	450	C063.7545	C063.7545F	C073.7545	1000
750	500	C063.7550	C063.7550F	-	885
750	600	C063.7560	C063.7560F	-	645



Concentric

Product Specification

- **Application** : used to reduce a pipeline



Eccentric

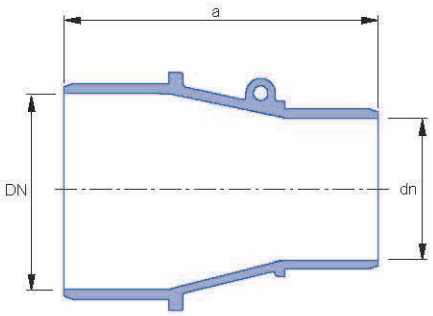
Product Specification

- **Application** : used to reduce a pipeline in gravity sewer applications

Note:
1. Flanged tapers with AS/NZS 4087 PN35 flanges are available on request with suffix "F", and Table "E" flanges AS 2129 with suffix "E".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Spigot Tapers:

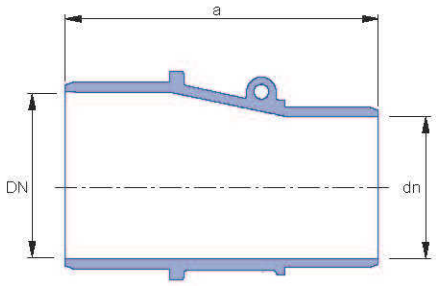
DN	dn	Product Codes		Dim. (mm) a
		Concentric PN35	Eccentric PN35	
80	50	C064.0805	C074.0805	242
80	58	C064.08058	C074.08058	226
100	58	C064.10058	C074.10058	250
100	80	C064.1008	C074.1008	268
125	100	C064.1210	C074.1210	269
150	80	C064.1508	C074.1508	394
150	100	C064.1510	C074.1510	331
150	125	C064.1512	C074.1512	340
200	100	C064.2010	C074.2010	470
200	150	C064.2015	C074.2015	343
225	100	C064.2210	C074.2210	534
225	150	C064.2215	C074.2215	406
225	200	C064.2220	C074.2220	292
250	100	C064.2510	C074.2510	597
250	150	C064.2515	C074.2515	470
250	200	C064.2520	C074.2520	355
250	225	C064.2522	C074.2522	292
300	100	C064.3010	C074.3010	724
300	150	C064.3015	C074.3015	597
300	200	C064.3020	C074.3020	482
300	225	C064.3022	C074.3022	418
300	250	C064.3025	C074.3025	355
375	150	C064.3715	C074.3715	814
375	200	C064.3720	C074.3720	698
375	225	C064.3722	C074.3722	635
375	250	C064.3725	C074.3725	572
375	300	C064.3730	C074.3730	444
450	150	C064.4515	C074.4515	1004
450	200	C064.4525	C074.4525	889
450	225	C064.4522	C074.4522	826
450	250	C064.4525	C074.4525	762
450	300	C064.4530	C074.4530	635
450	375	C064.4537	C074.4537	470
525	150	C064.5215	C074.5215	1131
525	200	C064.5220	C074.5220	1080
525	225	C064.5222	C074.5222	1016
525	250	C064.5225	C074.5225	952
525	300	C064.5230	C074.5230	826
525	375	C064.5237	C074.5237	661
525	450	C064.5245	C074.5245	470
600	200	C064.6020	C074.6020	1270
600	225	C064.6022	C074.6022	1206
600	250	C064.6025	C074.6025	1143
600	300	C064.6030	C074.6030	1016
600	375	C064.6037	C074.6037	852
600	450	C064.6045	C074.6045	661
600	525	C064.6052	C074.6052	470
750	450	C064.7545	C074.7545	1085
750	500	C064.7550	C074.7550	955
750	600	C064.7560	C074.7560	700



Concentric

Product Specification

- **Application** : used to reduce a pipeline



Eccentric

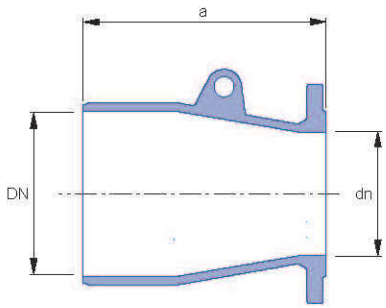
Product Specification

- **Application** : used to reduce a pipeline in gravity sewer applications

Note:
1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Spigot - Flange Tapers:

DN	dn	Product Code DICL PN16	Dim. (mm) a
100	80	C0643.1008	217
150	80	C0643.1508	349
150	100	C0643.1510	286
150	125	C0643.1512	381
200	100	C0643.2010	432
200	150	C0643.2015	305
225	100	C0643.2210	496
225	150	C0643.2215	368
225	200	C0643.2220	242
250	100	C0643.2510	559
250	150	C0643.2515	432
250	200	C0643.2520	305
250	225	C0643.2522	242
300	100	C0643.3010	692
300	150	C0643.3015	565
300	200	C0643.3020	438
300	225	C0643.3022	374
300	250	C0643.3025	311
375	150	C0643.3715	801
375	200	C0643.3720	660
375	225	C0643.3722	597
375	250	C0643.3725	534
375	300	C0643.3730	406
450	150	C0643.4515	991
450	200	C0643.4520	877
450	225	C0643.4522	814
450	250	C0643.4525	737
450	300	C0643.4530	610
450	375	C0643.4537	419
525	150	C0643.5215	1091
525	200	C0643.5220	977
525	225	C0643.5222	914
525	250	C0643.5225	933
525	300	C0643.5230	807
525	375	C0643.5237	616
525	450	C0643.5245	425
600	200	C0643.6020	1258
600	225	C0643.6022	1100
600	250	C0643.6025	1058
600	300	C0643.6030	1004
600	375	C0643.6037	814
600	450	C0643.6045	623
600	525	C0643.6052	496
750	450	C0643.7545	1035
750	500	C0643.7550	925
750	600	C0643.7560	680



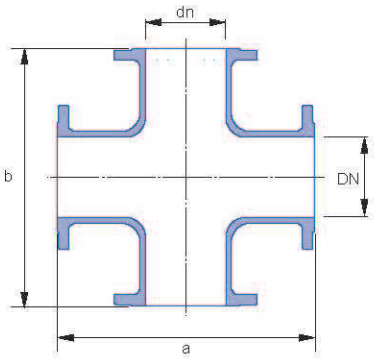
Product Specification

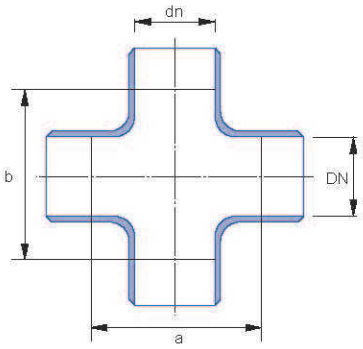
- **Application** : used to reduce a pipeline
- **dn Flanges** : PN16 AS/NZS 4087

Note:
1. Tapers with AS/NZS 4087 PN35 flanges are available on request with suffix "F", and Table "E" flanges AS 2129 with suffix "E".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Crosses:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b
		Flanged Cross PN16	Spigot Cross DICL PN16		
80	80	C083.0808	C084.0808	329	329
100	80	C083.1008	C084.1008	356	356
100	100	C083.1010	C084.1010	356	356
150	80	C083.1508	C084.1508	406	406
150	100	C083.1510	C084.1510	406	406
150	150	C083.1515	C084.1515	406	406
200	100	C083.2010	C084.2010	484	484
200	150	C083.2015	C084.2015	484	484
200	200	C083.2020	C084.2020	484	484
225	100	C083.2210	C084.2210	508	508
225	150	C083.2215	C084.2215	508	508
225	200	C083.2220	C084.2220	508	508
225	225	C083.2222	C084.2222	508	508
250	100	C083.2510	C084.2510	534	534
250	150	C083.2515	C084.2515	534	534
250	200	C083.2520	C084.2520	534	534
250	225	C083.2522	C084.2522	534	534
250	250	C083.2525	C084.2525	534	534
300	100	C083.3010	C084.3010	610	610
300	150	C083.3015	C084.3015	610	610
300	200	C083.3020	C084.3020	610	610
300	225	C083.3022	C084.3022	610	610
300	250	C083.3025	C084.3025	610	610
300	300	C083.3030	C084.3030	610	610
375	100	C083.3710	C084.3710	738	686
375	150	-	C084.3715	738	686
375	200	C083.3720	C084.3720	738	686
375	375	C083.3737	C084.3737	738	738
450	150	C083.4515	C084.4515	814	762
450	225	-	C084.4522	814	788
450	250	-	C084.4525	814	788
450	300	C083.4530	-	814	788
450	375	C083.4537	C084.4537	814	406
450	450	C083.4545	C084.4545	814	814
600	375	-	C084.6037	1016	990
600	600	-	C084.6060	1016	1016





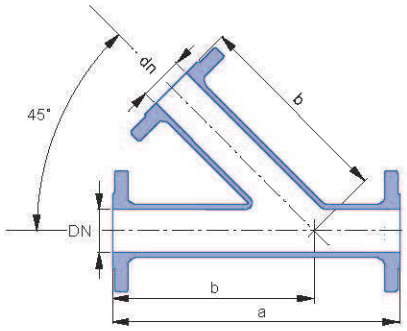
Product Specification

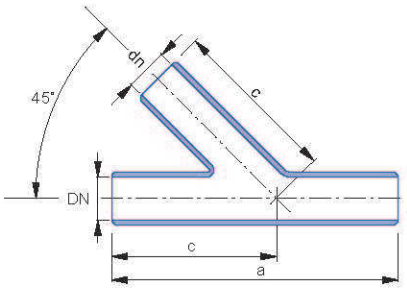
- **Application** : used to change directions in a pipeline.
- **DN & dn Flanges** : PN16 AS/NZS 4087

Note:
1. Flanged Crosses with AS/NZS 4087 PN35 flanges are avaliable on request with suffix "F", and Table "E" flanges AS 2129 with suffix "E".
2. All dimensions are in accordance with AS/NZS 2280, where applicable.
3. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Flange & Spigot Wyes:

DN	dn	Flanged Wye DICL PN16			Spigoted Wye DICL PN35			Spigot-Flange Wye DICL PN16		
		Product Code	Dim. (mm) a	Dim. (mm) b	Product Code	Dim. (mm) a	Dim. (mm) c	Product Code	Dim. (mm) a	Dim. (mm) c
80	80	C093.0808	442	332	C094.0808	492	364	C0943.0808	492	332
100	100	C093.1010	533	406	C094.1010	673	483	C0943.1010	673	406
150	100	C093.1510	635	508	C094.1510	648	483	C0943.1510	648	508
150	150	C093.1515	606	533	C094.1515	723	533	C0943.1515	723	533
200	100	C093.2010	635	533	C094.2010	673	508	C0943.2010	673	533
200	150	C093.2015	737	584	C094.2015	749	559	C0943.2015	749	584
200	200	C093.2020	767	610	C094.2020	851	635	C0943.2020	851	610
225	100	C093.2210	686	559	C094.2210	673	559	C0943.2210	673	559
225	150	C093.2215	711	584	C094.2215	750	610	C0943.2215	750	584
225	200	C093.2220	806	640	C094.2220	906	690	C0943.2220	906	640
225	225	C093.2222	838	635	C094.2222	902	686	C0943.2222	902	635
250	100	C093.2510	737	610	C094.2510	673	559	C0943.2510	673	610
250	150	C093.2515	762	635	C094.2515	749	584	C0943.2515	749	635
250	225	C093.2522	737	572	C094.2522	761	584	C0943.2522	761	572
250	250	C093.2525	914	711	C094.2525	978	737	C0943.2525	978	711
300	100	C093.3010	737	635	C094.3010	673	584	C0943.3010	673	635
300	150	C093.3015	787	660	C094.3015	750	610	C0943.3015	750	660
300	200	C093.3020	841	610	C094.3020	865	622	C0943.3020	865	610
300	225	C093.3022	914	711	C094.3022	876	686	C0943.3022	876	711
300	250	C093.3025	940	737	C094.3025	978	762	C0943.3025	978	737
300	300	C093.3030	991	762	C094.3030	1054	813	C0943.3030	1054	762
375	100	C093.3710	826	700	-	-	-	-	-	-
-	-	-	-	-	C094.3725	880	700	C0943.3725	880	700
375	375	C093.3737	943	749	C094.3737	1000	775	C0943.3737	1000	749
450	250	C093.4525	824	738	C094.4525	1180	921	C0943.4525	1180	738
450	300	C093.4530	-	-	-	-	-	-	-	-
450	450	C093.4545	1128	895	C094.4545	1185	930	C0943.4545	1185	895
600	450	C093.6045	1397	1167	-	-	-	-	-	-
600	600	C093.6060	1488	1167	C094.6060	1494	1170	C0943.6060	1494	1167





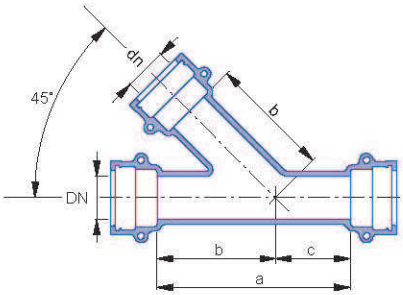
Product Specification

- **Application** : used for branching off a pipeline.
- **DN & dn Flanges** : PN16 AS/NZS 4087
- PN35 AS/NZS 4087 flanges are available on request with suffix "F" and Table "E" flanges AS 2129 with suffix "E".

Socket Wyes:

DN	dn	Product Codes		Dim. (mm) a	Dim. (mm) b	Dim. (mm) c
		Series 2 / DICL PN35	Series 1[1] PN16			
100	100	C091.1010	C092.1010	508	330	178
150	100	C091.1510	C092.1510	483	330	153
150	150	C091.1515	C092.1515	559	381	178

[1] Series 1 fittings fitted with adaptor seal are rated at PN12



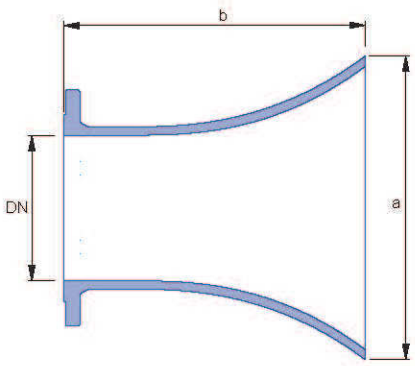
Product Specification

- **Application** : used for branching off a pipeline.

Note: 1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Bell Mouths:

DN	Product Code PN16	Dim. (mm) a	Dim. (mm) b
80	C19.08	178	203
100	C19.10	203	205
150	C19.15	254	300
200	C19.20	305	300
225	C19.22	381	300
250	C19.25	457	375
300	C19.30	457	450
375	C19.37	560	600
450	C19.45	685	600
500	C19.50	762	750
600	C19.60	762	900
750	C19.75	1140	922



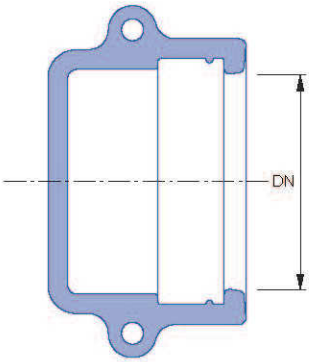
Product Specification

- **Application** : used in reservoir levels

Caps:

DN	Product Codes	
	Series 2 / DICL PN20	Series 1[2] PN16
80	-	C182.08
100	C181.10	C182.10
150	C181.15	C182.15
200	C181.20	C182.20
225	C181.22	C182.22
250	C181.25	C182.25
300	C181.30	C182.30
375	C181.37[1]	C182.37
450	C181.45[1]	-
500	C181.50[1]	-
600	C181.60[1]	-
750	C181.75[1]	-

[1] 375-750 rated at PN35
[2] Series 1 fittings fitted with adaptor seal are rated at PN12

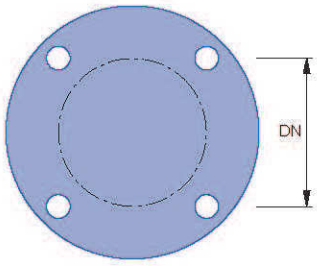


Product Specification

- **Application** : used to cap off a pipeline

Blank Flanges:

DN	Product Codes	
	PN16 AS/NZS 4087	PN35 AS/NZS 4087
50	C280.05	C280.05F
65	C280.06	C280.06F
80	C280.08	C280.08F
100	C280.10	C280.10F
150	C280.15	C280.15F
200	C280.20	C280.20F
225	C280.22	C280.22F
250	C280.25	C280.25F
300	C280.30	C280.30F
375	C280.37	C280.37F
450	C280.45	C280.45F
500	C280.50	C280.50F
525	C280.52	C280.52F
600	C280.60	C280.60F
750	C280.75	C280.75F

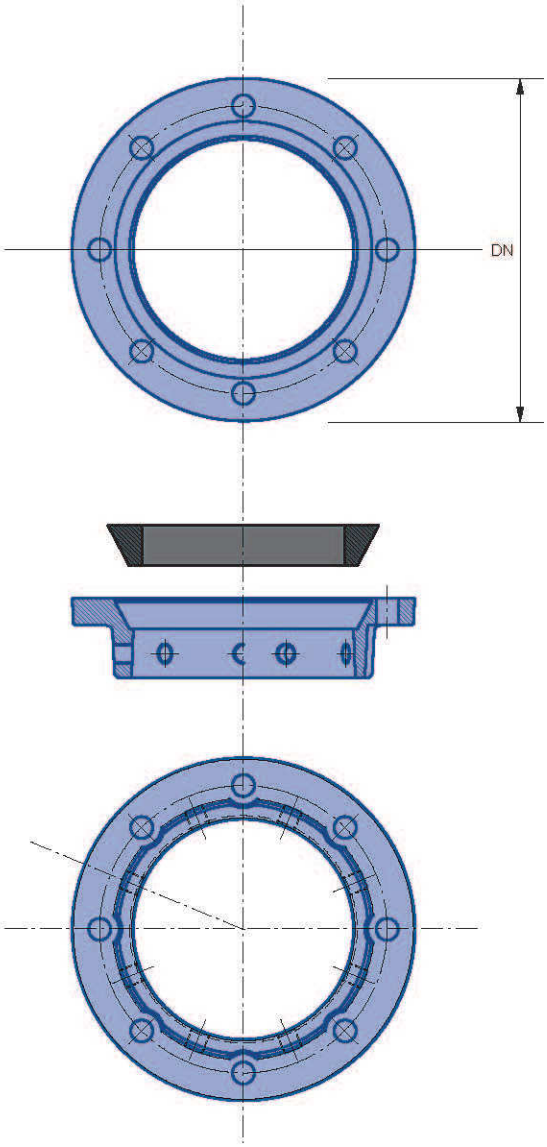


Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:
1. Tappings are available on request.
2. Flanged fittings with Table "E" AS 2129 with suffix "E".
3. All dimensions are in accordance with AS/NZS 2280, where applicable.
4. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Adapta Flanges PN7 - PN14:

DN	Product Code	Working Pressure (kPa)	Set Screw Torque (Nm)	Deflection
80	C286.08	1400	90	3°
100	C286.10	1400	90	3°
150	C286.15	1400	120	3°
200	C286.20	1400	120	3°
225	C286.22	1400	120	3°
250	C286.25	1400	120	3°
300	C286.30	1400	120	2°
375	C286.37	1000	150	2°
450	C286.45	1000	150	2°
500	C286.50	1000	150	1°
525	C286.52	700	150	1°
600	C286.60	700	150	1°



Product Specification

- **Application** : Adapta flanges are manufactured to join plain-ended ductile pipe to flanged valves, fittings and pipes, eliminating any difficulties usually experienced with rigid connections. Correctly prepared and assembled on ductile iron pipes, Adapta flanges are suitable for pressures up to 1400kPa. It is important to specify the following when ordering Adapta flanges.

  - Pipe outside diameter in mm
  - Nominal pipe diameter (DN)
  - Table drilling to the relevant Australian Standard

  Note :
  • The thickness of the Adapta flange will not necessarily be the same as the mating flange. This may require non standard bolt lengths for making the connection.

  • Adapta Flanges should be used with PN35 Irontite® pipe for sizes DN100 to DN250. For sizes DN300 and greater, 'Flanged Class' pipe should be used to accommodate higher set screw torque requirements.

  • The flange is made of ductile iron. Standard gasket (seal) supplied with the Adapta flange is EPDM and is suitable for water and waste water applications. Other gaskets are available on application and include, SBR, CR, NBR and FPM. For further information contact Iplex Pipelines.

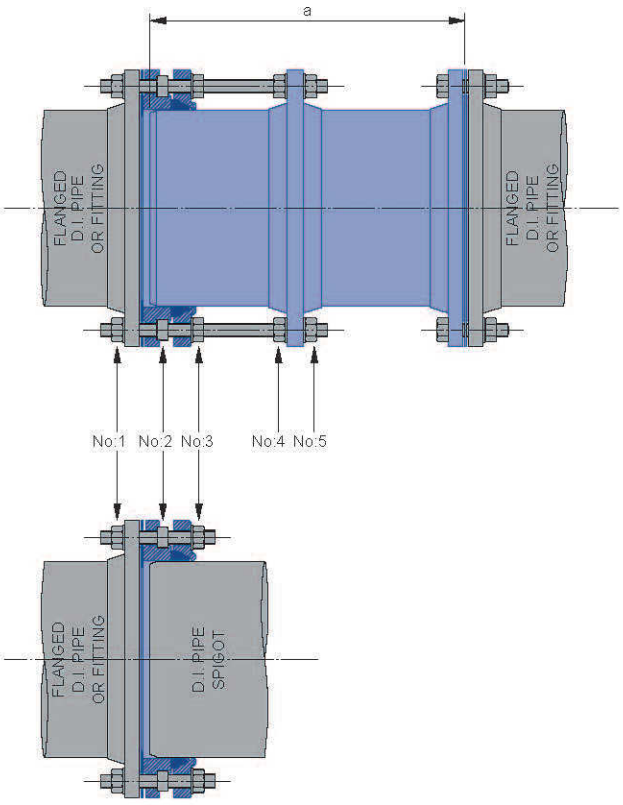
- **Installation** : Guidelines for Adapta Flange can be found on pages 111-112.

Note: 1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Dismantling Joints:

DN	Product Codes		Dim. (mm) a
	Type B PN16 Flanges 316 S/S Bolting	Type D PN16 Flanges 316 S/S Bolting	
80	C273.08	C278.08	400
100	C273.10	C278.10	400
150	C273.15	C278.15	400
200	C273.20	C278.20	400
225	C273.22	C278.22	400
250	C273.25	C278.25	400
300	C273.30	C278.30	400
375	C273.37	C278.37	600
450	C273.45	C278.45	600
500	C273.50	C278.50	600
600	C273.60	C278.60	600
750	C273.75	C278.75	600

Type 'B' Joint Assembly (Thrust Type)



Type 'D' Joint Assembly (Non-Thrust Type)

Product Specification

- **Application** : Dismantling joints are fittings specially designed to provide longtudinal adjustment in flanged pipe systems. They also provide a simple method for the installation and removal of flanged valves, pumps, flow meters and flanged pipe-work.

  Dismantling joints are available in two types of assemblies, Type B assembly, where thrust restraint is required and Type D where thrust restraint is not required.

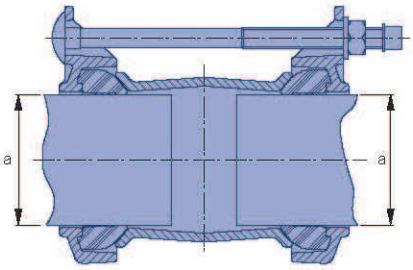
  Removing and adjusting certain stud nuts can sufficiently retract the stud and loosened flanges to allow the removal and replacement of the joint and associated pipe or fittings in the pipeline.

- **Installation** : Guidelines for Dismantling Joints can be found on pages 107-110.

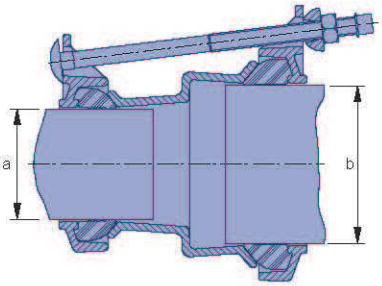
Note:
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. PN35 Flanges available on request only.

Universal Couplings - PN16:

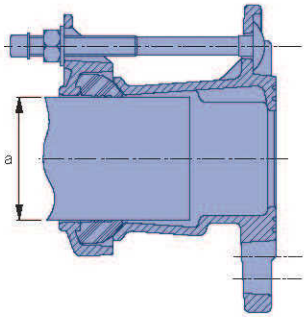
DN	Product Codes				Coupling Range (mm) a	Coupling Range (mm) b
	Short Series CI, DI, AC 316 S/S Bolting	Long Series PVC, CI, DI, AC 316 S/S Bolting	Stepped 316 S/S Bolting	Flanged 316 S/S Bolting		
40	C32601.046063	-	-	C32603.046063	46-63	-
40-50	-	-	C32602.063074	-	46-63	57-74
40-65	-	-	C32602.063085	-	46-63	68-85
50	C32601.057074	-	-	C32603.057074	57-74	-
50-65	-	-	C32602.057085	-	57-74	68-85
50-80	-	-	C32602.057106	-	57-74	84-106
65	C32601.068085	-	-	C32603.068085	68-85	-
65-80	-	-	C32602.085106	-	68-85	84-106
80	C32601.084106	C32605.084106	-	C32603.084106	84-106	-
80-100	-	-	C32602106119	-	84-106	99-119
100-100	-	-	C32602.106133	-	84-106	109-133
100	C32601.099119	-	-	C32603.099119	99-119	-
100	-	-	C32602.119133	-	99-119	109-133
100	-	-	C32602.119157	-	99-119	132-157
100	C32601.109133	C32605.109133	-	C32603.109133	109-133	-
100-125	-	-	C32602.133157	-	109-133	132-157
100-150	-	-	C32602.133183	-	109-133	157-183
125	C32601.132157	-	-	C32603.132157	132-157	-
125-150	-	-	C32602.157183	-	132-157	157-183
150	C32601.157183	C32605.157183	-	C32603.157183	157-183	-
150-150	-	-	C32602.183201	-	157-183	176-201
150	C32601.176201	-	-	C32603.176201	176-201	-
150-200	-	-	C32602.201215	-	176-201	193-215
150-200	-	-	C32602.201242	-	176-201	218-242
200	C32601.193215	-	-	C32603.193215	193-215	-
200-200	-	-	C32602.215242	-	193-215	218-242
200-225	-	-	C32602.193268	-	193-215	242-268
200	C32601.218242	C32604.218242	-	C32603.218242	218-242	-
200-225	-	-	C32602.242268	-	218-242	242-268
225	C32601.242268	C32604.242268	-	-	242-268	-
225-250	-	-	C32602.268292	-	242-268	266-292
250	C32601.266292	C32604.266292	-	C32603.266292	266-292	-
250-300	-	-	C32602.292306	-	266-292	280-306
250-300	-	-	C32602.292327	-	266-292	301-327
250	C32601.280306	-	C32602.280306	-	280-306	-
300	C32601.301327	-	-	C32603.301327	301-327	-
300-350	-	-	C32602.327350	-	301-327	324-350
300-350	-	-	C32602.327378	-	301-327	352-378
300	C32601.324350	C32604.324350	-	C32603.324350	324-350	-
300-350	-	-	C32602.350378	-	324-350	352-378
350	C32601.352378	-	-	-	352-378	-
350-350	-	-	C32602.378396	-	352-378	372-396
350	C32601.372396	-	-	-	372-396	-
350-350	-	-	C32602.396410	-	372-396	384-410
350	C32601.384410	-	-	-	384-410	-
350-400	-	-	C32602.410436	-	384-410	410-436
400	C32601.410436	C32604.410436	-	-	410-436	-
400-400	-	-	C32602.436462	-	410-436	436-462
400	C32601.436462	-	C32602.436462	-	436-462	-



Universal Coupling Short or Long



Universal Coupling Stepped

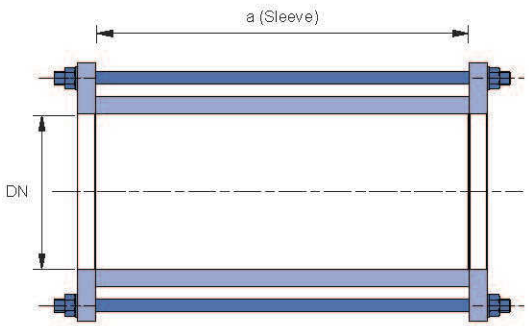


Universal Coupling Flanged

Note: 1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Sydney Water Long Barrel - PN16:

DN	Product Code	Description 1	Description 2	Dim. (mm) a
100	C315.10	100 GIBAULT SWB	NC 316 SS BOLTING PN16	225
150	C315.15	150 GIBAULT SWB	NC 316 SS BOLTING PN16	225
200	C315.20	200 GIBAULT SWB	NC 316 SS BOLTING PN16	225
250	C315.25	250 GIBAULT SWB	NC 316 SS BOLTING PN16	225
300	C315.30	300 GIBAULT SWB	NC 316 SS BOLTING PN16	225
375	C315.37	375 GIBAULT SWB	NC 316 SS BOLTING PN16	225
450	C315.45	450 GIBAULT SWB	NC 316 SS BOLTING PN16	225
500	C315.50	500 GIBAULT SWB	NC 316 SS BOLTING PN16	225
600	C315.60	600 GIBAULT SWB	NC 316 SS BOLTING PN16	225



Product Specification

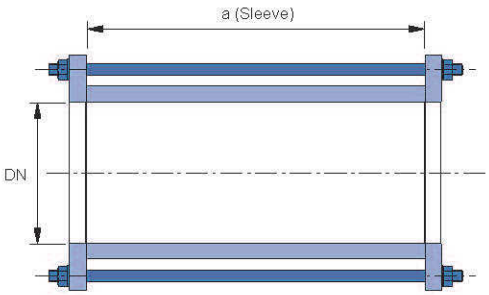
- **Application** : To join/repair the following pipe types:
  - AC to AC (Machined spigot/barrels only)
  - AC to Ductile Iron
  - Ductile Iron to Ductile Iron
  - Ductile Iron to Cast Iron
  - Cast Iron to Cast Iron
  - Series 2 PVC to Ductile Iron
  - Series 2 PVC to Cast Iron
  - Series 2 PVC to AC (Machinedspigot/barrels only)

- **Installation** : Guidelines for Gibault Joints can be found on pages 105-106.

Note:
1 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
2 Sydney Water Long Barrel Gibault joints are supplied with insulated bolts.

Long Barrel - PN16:

DN	Product Code	Description 1	Description 2	Dim. (mm) a
50	C3171.05	58 GIBAULT ELONG S2	NC GS BOLTING PN16	100
50	C3171.05S	58 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	100
80	C3171.08	80 GIBAULT ELONG S2	NC GS BOLTING PN16	150
80	C3171.08S	80 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
100	C3171.10	100 GIBAULT ELONG S2	NC GS BOLTING PN16	150
100	C3171.10S	100 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
150	C3171.15	150 GIBAULT ELONG S2	NC GS BOLTING PN16	150
150	C3171.15S	150 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
200	C3171.20	200 GIBAULT ELONG S2	NC GS BOLTING PN16	150
200	C3171.20S	200 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
225	C3171.22	225 GIBAULT ELONG S2	NC GS BOLTING PN16	150
225	C3171.22S	225 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
250	C3171.25	250 GIBAULT ELONG S2	NC GS BOLTING PN16	150
250	C3171.25S	250 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
300	C3171.30	300 GIBAULT ELONG S2	NC GS BOLTING PN16	150
300	C3171.30A	300 GIBAULT ELONG S2 AB	NC 316 SS BOLTING PN16	150
300	C3171.30S	300 GIBAULT ELONG S2 SS	NC GS BOLTING PN16	150
375	C3171.37	375 GIBAULT ELONG S2	NC 316 SS BOLTING PN16	150
375	C3171.378	375 GIBAULT ELONG S2	NC GS BOLTING PN16	150
375	C3171.378S	375 GIBAULT ELONG S2 SS	NC 316 SS BOLTING 8 BOLT PN16	150
375	C3171.37S	375 GIBAULT ELONG S2 SS	NC 316 SS BOLTING PN16	150
450	C3172.45	450 GIBAULT ELONG S2 LG	NC GS BOLTING PN16	250
450	C3172.458	450 GIBAULT ELONG S2 LG	NC GS BOLTING 8 BOLT PN16	250
450	C3172.458S	450 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING 8 BOLT PN16	250
450	C3172.45A	450 GIBAULT ELONG S2 LG AB	NC SS BOLTING PN16	250
450	C3172.45S	450 GIBAULT ELONG S2 LG SS	NC GS BOLTING PN16	250
500	C3172.50	500 GIBAULT ELONG S2 LG	NC GS BOLTING PN16	250
500	C3172.5010	500 GIBAULT ELONG S2 LG	NC GS BOLTING 10 BOLT PN16	250
500	C3172.5010S	500 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING 10 BOLT PN16	250
500	C3172.50S	500 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING PN16	250
525	C3172.52	525 GIBAULT ELONG S2 LG	NC GS BOLTING PN16	250
525	C3172.5210	525 GIBAULT ELONG S2 LG	BD GS BOLTING 10 BOLT PN16	250
525	C3172.5210S	525 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING 10 BOLT PN16	250
525	C3172.52S	525 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING PN16	250
600	C3172.60	600 GIBAULT ELONG S2 LG	NC GS BOLTING PN16	250
600	C3172.6010	600 GIBAULT ELONG S2 LG	NC GS BOLTING 10 BOLT PN16	250
600	C3172.6010S	600 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING 10 BOLT PN16	250
600	C3172.60S	600 GIBAULT ELONG S2 LG SS	NC 316 SS BOLTING PN16	250
750	C3172.75	750 GIBAULT ELONG S2 LG	NC GS BOLTING PN16	250



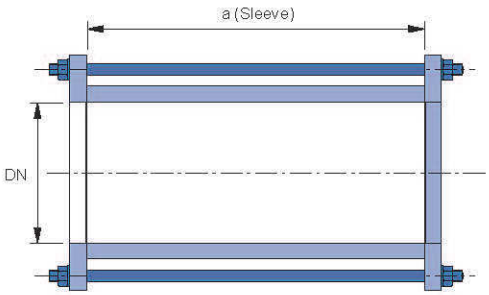
Product Specification

- **Application** : To join/repair the following pipe types:
  - AC to AC
  - AC to Ductile Iron
  - Ductile Iron to Ductile Iron
  - Ductile Iron to Cast Iron
  - Cast Iron to Cast Iron
  - Ductile Iron to Series 2 PVC
  - Cast Iron to Series 2 PVC
  - AC to Series 2 PVC
- **Installation** : Guidelines for Gibault Joints can be found on pages 105-106 .

Note: DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Blank Long Barrel - PN16:

DN	Product Code	Description 1	Description 2	Dim. (mm) a
58	C3185.05	58 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	100
58	C3185.05S	58 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	100
80	C3185.08	80 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
80	C3185.08S	80 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
100	C3185.10	100 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
100	C3185.10S	100 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
150	C3185.15	150 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
150	C3185.15S	150 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
200	C3185.20	200 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
200	C3185.20S	200 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
225	C3185.22	225 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
225	C3185.22S	225 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
250	C3185.25	250 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
250	C3185.25S	250 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
300	C3185.30	300 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
300	C3185.30S	300 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
375	C3185.37	375 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
375	C3185.37S	375 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	150
450	C3185.45	450 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	250
450	C3185.45S	450 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	250
500	C3185.50	500 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	250
500	C3185.50S	500 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	250
525	C3185.52	525 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	250
525	C3185.52S	525 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	250
600	C3185.60	600 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	250
600	C3185.60S	600 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	250



Product Specification

- **Application** : To blank off following pipe types:
  - AC
  - Ductile Iron
  - Cast Iron
  - S2 PVC
- **Installation** : Guidelines for Gibault Joints can be found on pages 105-106.

Blank Long Barrel Flange Tapped - PN16:

DN	Product Code	Description 1	Description 2	Dim. (mm) a
58	C3185.05050	58 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 50BSP PN16	100
80	C3185.08050	80 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 50BSP PN16	150
80	C3185.08080	80 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 80BSP PN16	150
100	C3185.10050	100 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 50BSP PN16	150
100	C3185.10080	100 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 80BSP PN16	150
150	C3185.15050	150 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 50BSP PN16	150
200	C3185.20050	200 GIBAULT BLANK S2 ELONG F	NC GS BOLTING FL 50BSP PN16	150

Blank Long Barrel - PN16 - Series 1 PVC:

DN	Product Code	Description 1	Description 2	Dim. (mm) a
80	C3181.08	80 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	95
80	C3181.08S	80 GIBAULT BLANK S1 PVC SS	BD 316 SS BOLTING PN16	95
100	C3181.10	100 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	95
100	C3181.10S	100 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	95
150	C3181.15	150 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	95
150	C3181.15S	150 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	95
195	C3181.19	195 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	170
195	C3181.19S	195 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	170
200	C3181.20	200 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	170
200	C3181.20S	200 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	170
225	C3181.22	225 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	170
225	C3181.22S	225 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	170
250	C3181.25	250 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	170
250	C3181.25S	250 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	170
300	C3181.30	300 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	170
300	C3181.30S	300 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	170
375	C3181.37	375 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	170
375	C3181.37S	375 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	170

Product Specification

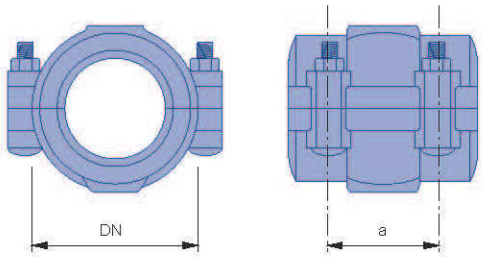
- **Application** : To blank off S1 PVC pipe
- **Installation** : Guidelines for Gibault Joints can be found on pages 105-106.

Note: DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Multi-fit Joints - DI, CI, AC & S2 PVC:

Multi-fit Joints 4 & 6 Bolt

DN	Product Code	Description	Dim. (mm) a
80	C361.08	80 MULTIFIT 4 BOLT	146
100	C361.10	100 MULTIFIT 4 BOLT	146
150	C361.15	150 MULTIFIT 4 BOLT	146
200	C361.20	200 MULTIFIT 4 BOLT	146
225	C361.22	225 MULTIFIT 4 BOLT	160
250	C361.25	250 MULTIFIT 4 BOLT	160
300	C361.30	300 MULTIFIT 4 BOLT	160
375	C361.37	375 MULTIFIT 4 BOLT	200
450	C361.45	450 MULTIFIT 4 BOLT	200
525	C361.52	525 MULTIFIT 6 BOLT	200
600	C361.60	600 MULTIFIT 6 BOLT	200

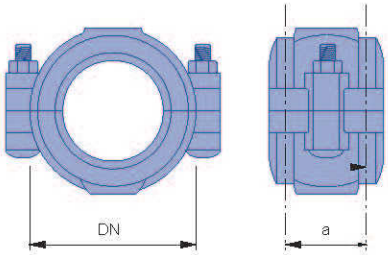


Multi-fit Joints 2 Bolt

DN	Product Code	Description	Dim. (mm) a
80	C362.08	80 MULTIFIT 2 BOLT	78
100	C362.10	100 MULTIFIT 2 BOLT	78
150	C362.15	150 MULTIFIT 2 BOLT	78
200	C362.20	200 MULTIFIT 2 BOLT	78

Multi-fit Joints - Series 1 PVC:

DN	Product Code	Description	Dim. (mm) a
80	C363.08	80 MULTIFIT 2 BOLT	78
100	C363.10	100 MULTIFIT 2 BOLT	78
150	C363.15	150 MULTIFIT 2 BOLT	78



Product Specification

- **Application** : Each joint is provided with a tapping boss allowing the fitting of an off take, where required. The Multi-fit Joint (MJF) can be used for tapping or repair of pipelines.

  Multi-fit Joints (MJF) consist of two castings that seal to ductile iron pipelines and PVC pipelines by means of two moulded rubber seals. The seals sit in the longitudinal and circumferential grooves of each casting. Cup head bolts key into the castings to clamp each casting together to form a waterlight seal. Lubricant should be applied to the pipe surfaces to assist when fitting the joint.

  Multi-fit Joints can be used with:

  - AC Pipe
  - DICL & CICL Pipelines
  - PVC Pressure Pipes (Series 1 or Series 2)

- **Installation** : Guidelines for Multi-fit Joints can be found on page 104.

Note: 1 Tappings are available on request.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Taptite® Tapping Bands without Seal Nut:

DN	Product Codes	
	Taptite® Blue Series 2 / DICL	Taptite® White Series 1
100	C201.10	C202.10
150	C201.15	C202.15
200	C201.20	C202.20
225	C201.22	C202.22
250	C201.25	C202.25
300	C201.30	C202.30
375	C201.37	C202.37
450	C201.45	-
500	C201.50	-
600	C201.60	-

Taptite® Seal Nut:

Nominal Size (mm) BSP	Product Code Suits DN100 - DN300 Taptite® tapping bands
20	C2090.020
25	C2090.025

Product Specification

- **Application** : Taptite® tapping bands are available for use with BSP threaded take-off connections with Irontite™ pipes in sizes DN100 up to DN600. Taptite® tapping bands are suitable for working pressures up to 1600kPa.

  These fittings provide the location for installing a ferrule and bend and service pipe. For typical arrangements refer to local water authority requirements.

  Taptite® Blue bands are suitable for use with Series 2 PVC-U, PVC-M and PVC-O pressure pipes and ductile iron pipes in sizes DN100 to DN600 with tapping sizes DN20 and DN25 only.

  Taptite® White bands are suitable for use with Series 1 PVC-U and PVC-M pressure pipes in sizes DN100 to DN600 with tapping sizes DN20 and DN25 only.

  Taptite® Blue bands are classified as Type F & R and Taptite® White as Type F.

  Note: Type F bands are designed for use with flexible pipes, typically PVC Series 1 and Series 2 or just Series 1. Type R Bands are designed for use with 'rigid' pipes only typically ductile iron, grey cast iron or asbestos cement. Type 'F' tapping bands are full circle design, incorporating a full circle stop feature to prevent diametrical deflection of plastic pipes.

- **Features** :
  - Cast in ductile iron with polymeric coasting to AS 4158.
  - Stainless steel bolting.
  - Special spacer, keeping bolts in place and prevents over tightening on PVC pipes.
  - Hexagonal bolt heads located between lugs which will not turn when being tightened.
  - Taptite® exclusive "In-liner" sleeve keeps the flow through the pipe wall constant. The "In-liner" prevents tuberculation growth from forming in the freshly drilled hole in the pipe wall. By utilizing the standard plug cock type, the under pressure tapping ferrule cock "In-liner" sleeves can be fitted under pressure as part of the initial off-takes fitting installation.

- **Installation** : Guidelines for Tapping bands can be found on pages 99-100.

Note: DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Taptite® Inliner:

Nominal size BSP (mm)	Sleeve	Tool
20	C2092.020	C2095.050
25	C2092.025	C2095.025

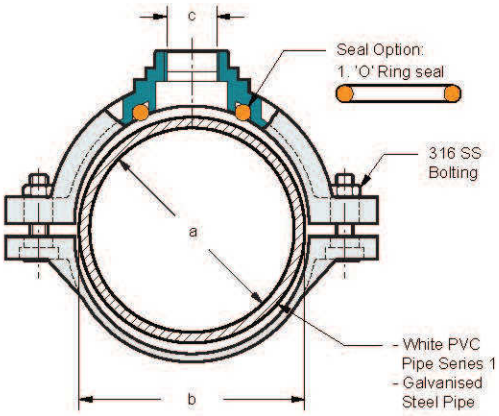
Product Specification

- **Application** : tool used for inserton of inliner
- **Installation** : Guidelines for Taptite® Inliner can be found on page 99

Note: DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Milnes® Tapping Bands for Series 1 (White) PVC:

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60A4020	40X20RP T/BND GM S1PVC	40	48	20	¾"
GM60A4025	40X25RP T/BND GM S1PVC	40	48	25	1"
GM60A5020	50X20RP T/BND GM S1PVC	50	60	20	¾"
GM60A5025	50X25RP T/BND GM S1PVC	50	60	25	1"
GM60A5032	50X32RP T/BND GM S1PVC	50	60	32	1 ¼"
GM60A5040	50X40RP T/BND GM S1PVC	50	60	40	1 ½"
GM60A6520	65X20RP T/BND GM S1PVC	65	75	20	¾"
GM60A6525	65X25RP T/BND GM S1PVC	65	75	25	1"
GM60A6532	65X32RP T/BND GM S1PVC	65	75	32	1 ¼"
GM60A6540	65X40RP T/BND GM S1PVC	65	75	40	1 ½"
GM60A8020	80X20RP T/BND GM S1PVC	80	89	20	¾"
GM60A8025	80X25RP T/BND GM S1PVC	80	89	25	1"
GM60A8032	80X32RP T/BND GM S1PVC	80	89	32	1 ¼"
GM60A8040	80X40RP T/BND GM S1PVC	80	89	40	1 ½"
GM60A8050	80X50RP T/BND GM S1PVC	80	89	50	2"
GM60A10020	100X20RP T/BND GM S1PVC	100	114	20	¾"
GM60A10025	100X25RP T/BND GM S1PVC	100	114	25	1"
GM60A10032	100X32RP T/BND GM S1PVC	100	114	32	1 ¼"
GM60A10040	100X40RP T/BND GM S1PVC	100	114	40	1 ½"
GM60A10050	100X50RP T/BND GM S1PVC	100	114	50	2"
GM60A12520	125X20RP T/BND GM S1PVC	125	140	20	¾"
GM60A12525	125X25RP T/BND GM S1PVC	125	140	25	1"
GM60A12532	125X32RP T/BND GM S1PVC	125	140	32	1 ¼"
GM60A12540	125X40RP T/BND GM S1PVC	125	140	40	1 ½"
GM60A12550	125X50RP T/BND GM S1PVC	125	140	50	2"
GM60A15020	150X20RP T/BND GM S1PVC	150	160	20	¾"
GM60A15025	150X25RP T/BND GM S1PVC	150	160	25	1"
GM60A15032	150X32RP T/BND GM S1PVC	150	160	32	1 ¼"
GM60A15040	150X40RP T/BND GM S1PVC	150	160	40	1 ½"
GM60A15050	150X50RP T/BND GM S1PVC	150	160	50	2"
GM60A17520	175X20RP T/BND GM S1PVC	175	200	20	¾"
GM60A17525	175X25RP T/BND GM S1PVC	175	200	25	1"
GM60A17532	175X32RP T/BND GM S1PVC	175	200	32	1 ¼"
GM60A17540	175X40RP T/BND GM S1PVC	175	200	40	1 ½"
GM60A17550	175X50RP T/BND GM S1PVC	175	200	50	2"
GM60A20020	200X20RP T/BND GM S1PVC	200	225	20	¾"
GM60A20025	200X25RP T/BND GM S1PVC	200	225	25	1"
GM60A20032	200X32RP T/BND GM S1PVC	200	225	32	1 ¼"
GM60A20040	200X40RP T/BND GM S1PVC	200	225	40	1 ½"
GM60A20050	200X50RP T/BND GM S1PVC	200	225	50	2"
GM60A22520	225X20RP T/BND GM S1PVC	225	250	20	¾"
GM60A22525	225X25RP T/BND GM S1PVC	225	250	25	1"
GM60A22532	225X32RP T/BND GM S1PVC	225	250	32	1 ¼"
GM60A22540	225X40RP T/BND GM S1PVC	225	250	40	1 ½"
GM60A22550	225X50RP T/BND GM S1PVC	225	250	50	2"
GM60A25020	250X20RP T/BND GM S1PVC	250	280	20	¾"
GM60A25025	250X25RP T/BND GM S1PVC	250	280	25	1"
GM60A25032	250X32RP T/BND GM S1PVC	250	280	32	1 ¼"
GM60A25040	250X40RP T/BND GM S1PVC	250	280	40	1 ½"
GM60A25050	250X50RP T/BND GM S1PVC	250	280	50	2"
GM60A30020	300X20RP T/BND GM S1PVC	300	315	20	¾"
GM60A30025	300X25RP T/BND GM S1PVC	300	315	25	1"
GM60A30032	300X32RP T/BND GM S1PVC	300	315	32	1 ¼"
GM60A30040	300X40RP T/BND GM S1PVC	300	315	40	1 ½"
GM60A30050	300X50RP T/BND GM S1PVC	300	315	50	2"
GM60A37520	375X20RP T/BND GM S1PVC	375	400	20	¾"
GM60A37525	375X25RP T/BND GM S1PVC	375	400	25	1"
GM60A37532	375X32RP T/BND GM S1PVC	375	400	32	1 ¼"
GM60A37540	375X40RP T/BND GM S1PVC	375	400	40	1 ½"
GM60A37550	375X50RP T/BND GM S1PVC	375	400	50	2"



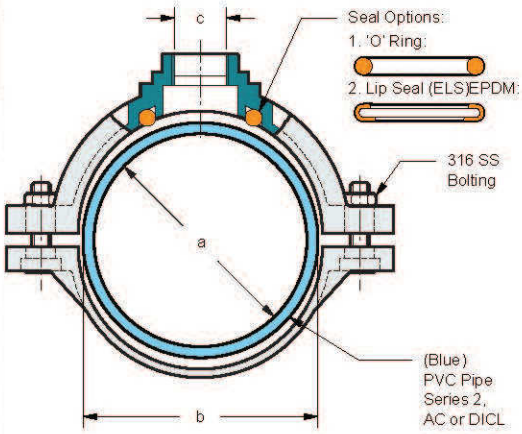
Product Specification

- **Application** : Mechanical tapping bands provides a means for the connection of service pipes from a pipeline
- **Suitable for** : AS/NZS 1477 Series 1 White UPVC Pipe & AS/NZS 4765 Series 1 MPVC Pipe
- **Product Standard**: AS/NZS 4793
- **Pressure Rating**: PN16
- **Metallic Material**: AS1565 Gunmetal
- **Bolting**: 316 Stainless Steel Bolt Type F
- **Seal**: AS1646 Nitrile rubber
- **Potable Water Compliance**: AS4020
- **Installation** : Guidelines for Tapping Bands can be found on pages 99-100

Note:
1 Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.
2 Refer to pipe product standard for actual pipe tolerance. E.g. AS/NZS 4765 for PVC-M pipe tolerances.
3 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

Milnes® Tapping Bands for Series 2 (Blue) PVC, AC or DICL:

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60B5020	50X20RP T/BND GM AC/S2	50	70	20	¾"
GM60B5025	50X25RP T/BND GM AC/S2	50	70	25	1"
GM60B5820	58X20RP T/BND GM AC/S2	58	78	20	¾"
GM60B5820ELS	58X20RP T/BND GM AC/S2	58	78	20	¾"
GM60B5825	58X25RP T/BND GM AC/S2	58	78	25	1"
GM60B5825ELS	58X25RP T/BND GM AC/S2	58	78	25	1"
GM60B8020	80X20RP T/BND GM AC/S2	80	96	20	¾"
GM60B8020ELS	80X20RP T/BND GM AC/S2	80	96	20	¾"
GM60B8025	80X25RP T/BND GM AC/S2	80	96	25	1"
GM60B8025ELS	80X25RP T/BND GM AC/S2	80	96	25	1"
GM60B8032	80X32RP T/BND G/M AC/S2	80	96	32	1 ¼"
GM60B8032ELS	80X32RP T/BND GM AC/S2	80	96	32	1 ¼"
GM60B8040	80X40RP T/BND GM AC/S2	80	96	40	1 ½"
GM60B8040ELS	80X40RP T/BND GM AC/S2	80	96	40	1 ½"
GM60B8050	80X50RP T/BND GM AC/S2	80	96	50	2"
GM60B8050ELS	80X50RP T/BND GM AC/S2	80	96	50	2"
GM60B10020	100X20RP T/BND GM AC/S2	100	122	20	¾"
GM60B10020ELS	100X20RP T/BND GM AC/S2	100	122	20	¾"
GM60B10025	100X25RP T/BND GM AC/S2	100	122	25	1"
GM60B10025ELS	100X25RP T/BND GM AC/S2	100	122	25	1"
GM60B10032	100X32RP T/BND GM AC/S2	100	122	32	1 ¼"
GM60B10032ELS	100X32RP T/BND GM AC/S2	100	122	32	1 ¼"
GM60B10040	100X40RP T/BND GM AC/S2	100	122	40	1 ½"
GM60B10040ELS	100X40RP T/BND GM AC/S2	100	122	40	1 ½"
GM60B10050	100X50RP T/BND GM AC/S2	100	122	50	2"
GM60B10050ELS	100X50RP T/BND GM AC/S2	100	122	50	2"
GM60B15020	150X20RP T/BND GM AC/S2	150	177	20	¾"
GM60B15020ELS	150X20RP T/BND GM AC/S2	150	177	20	¾"
GM60B15025	150X25RP T/BND GM AC/S2	150	177	25	1"
GM60B15025ELS	150X25RP T/BND GM AC/S2	150	177	25	1"
GM60B15032	150X32RP T/BND GM AC/S2	150	177	32	1 ¼"
GM60B15032ELS	150X32RP T/BND GM AC/S2	150	177	32	1 ¼"
GM60B15040	150X40RP T/BND GM AC/S2	150	177	40	1 ½"
GM60B15040ELS	150X40RP T/BND GM AC/S2	150	177	40	1 ½"
GM60B15050	150X50RP T/BND GM AC/S2	150	177	50	2"
GM60B15050ELS	150X50RP T/BND GM AC/S2	150	177	50	2"
GM60B20020	200X20RP T/BND GM AC/S2	200	232	20	¾"
GM60B20020ELS	200X20RP T/BND GM AC/S2	200	232	20	¾"
GM60B20025	200X25RP T/BND GM AC/S2	200	232	25	1"
GM60B20025ELS	200X25RP T/BND GM AC/S2	200	232	25	1"
GM60B20032	200X32RP T/BND GM AC/S2	200	232	32	1 ¼"
GM60B20032ELS	200X32RP T/BND GM AC/S2	200	232	32	1 ¼"
GM60B20040	200X40RP T/BND GM AC/S2	200	232	40	1 ½"
GM60B20040ELS	200X40RP T/BND GM AC/S2	200	232	40	1 ½"
GM60B20050	200X50RP T/BND GM AC/S2	200	232	50	2"
GM60B20050ELS	200X50RP T/BND GM AC/S2	200	232	50	2"
GM60B22520	225X20RP T/BND GM AC/S2	225	259	20	¾"
GM60B22525	225X25RP T/BND GM AC/S2	225	259	25	1"
GM60B22525ELS	225X25RP T/BND GM AC/S2	225	259	25	1"
GM60B22532	225X32RP T/BND GM AC/S2	225	259	32	1 ¼"
GM60B22540	225X40RP T/BND GM AC/S2	225	259	40	1 ½"
GM60B22540ELS	225X40RP T/BND GM AC/S2	225	259	40	1 ½"
GM60B22550	225X50RP T/BND GM AC/S2	225	259	50	2"
GM60B22550ELS	225X40RP T/BND GM AC/S2	225	259	50	2"



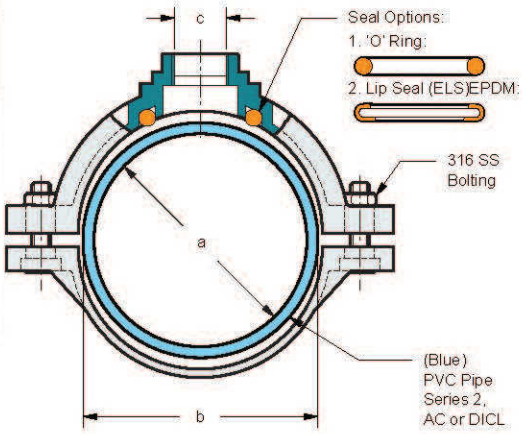
Product Specification

- **Application** : Mechanical tapping bands provides a means for the connection of service pipes from a pipeline
- **Suitable for** : AS/NZS 4765 Series 2 MPVC & AS/NZS4441 Series 2 OPVC
- **Product Standard** : AS/NZS 4793
- **Pressure Rating** : PN16
- **Metallic Material** : AS1565 Gunmetal
- **Bolting** : 316 Stainless Steel
- **Seal** : AS1646 EPDM
- **Potable Water Compliance** : AS4020
- **Installation** : Guidelines for Tapping Bands can be found on pages 99-100

Note:
1 Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.
2 Refer to pipe product standard for actual pipe tolerance. E.g. AS/NZS 4765 for PVC-M pipe tolerances.
3 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

Milnes® Tapping Bands for Series 2 (Blue) PVC, AC or DICL: Continued...

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60B25020	250X20RP T/BND GM AC/S2	250	286	20	¾"
GM60B25020ELS	250X20RP T/BND GM AC/S2	250	286	20	¾"
GM60B25025	250X25RP T/BND GM AC/S2	250	286	25	1"
GM60B25025ELS	250X25RP T/BND GM AC/S2	250	286	25	1"
GM60B25032	250X32RP T/BND GM AC/S2	250	286	32	1 ¼"
GM60B25040	250X40RP T/BND GM AC/S2	250	286	40	1 ½"
GM60B25040ELS	250X40RP T/BND GM AC/S2	250	286	40	1 ½"
GM60B25050	250X50RP T/BND GM AC/S2	250	286	50	2"
GM60B25050ELS	250X50RP T/BND GM AC/S2	250	286	50	2"
GM60B30020	300X20RP T/BND GM AC/S2	300	345	20	¾"
GM60B30020ELS	300X20RP T/BND GM AC/S2	300	345	20	¾"
GM60B30025	300X25RP T/BND GM AC/S2	300	345	25	1"
GM60B30025ELS	300X25RP T/BND GM AC/S2	300	345	25	1"
GM60B30032	300X32RP T/BND GM AC/S2	300	345	32	1 ¼"
GM60B30040	300X40RP T/BND GM AC/S2	300	345	40	1 ¼"
GM60B30040ELS	300X40RP T/BND GM AC/S2	300	345	40	1 ½"
GM60B30050	300X50RP T/BND GM AC/S2	300	345	50	2"
GM60B30050ELS	300X50RP T/BND GM AC/S2	300	345	50	2"
GM60B37520	375X20RP T/BND GM AC/S2	375	426	20	¾"
GM60B37520ELS	375X20RP T/BND GM AC/S2	375	426	20	¾"
GM60B37525	375X25RP T/BND GM AC/S2	375	426	25	1"
GM60B37525ELS	375X25RP T/BND GM AC/S2	375	426	25	1"
GM60B37532	375X32RP T/BND GM AC/S2	375	426	32	1 ¼"
GM60B37540	375X40RP T/BND GM AC/S2	375	426	40	1 ¼"
GM60B37540ELS	375X40RP T/BND GM AC/S2	375	426	40	1 ½"
GM60B37550	375X50RP T/BND GM AC/S2	375	426	50	2"
GM60B37550ELS	375X50RP T/BND GM AC/S2	375	426	50	2"
GM60B45020	450X20RP T/BND GM AC/S2	450	507	20	¾"
GM60B45025	450X25RP T/BND GM AC/S2	450	507	25	1"
GM60B45025ELS	450X25RP T/BND GM AC/S2	450	507	25	1"
GM60B45032	450X32RP T/BND GM AC/S2	450	507	32	1 ¼"
GM60B45040	450X40RP T/BND GM AC/S2	450	507	40	1 ½"
GM60B45050	450X50RP T/BND GM AC/S2	450	507	50	2"
GM60B45050ELS	450X50RP T/BND GM AC/S2	450	507	50	2"



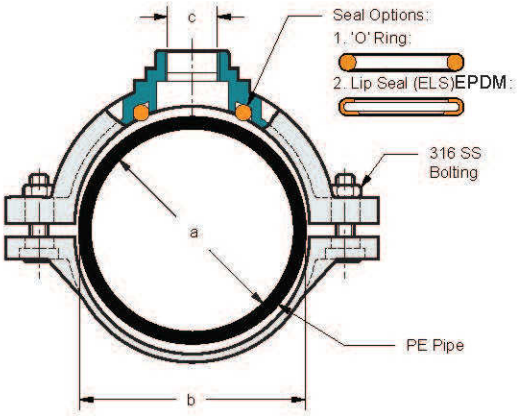
Product Specification

- **Application** : Mechanical tapping bands provides a means for the connection of service pipes from a pipeline
- **Suitable for** : AS/NZS 4765 Series 2 MPVC & AS/NZS4441 Series 2 OPVC
- **Product Standard** : AS/NZS 4793
- **Pressure Rating** : PN16
- **Metallic Material** : AS1565 Gunmetal
- **Bolting** : 316 Stainless Steel
- **Seal** : AS1646 EPDM
- **Potable Water Compliance** : AS4020
- **Installation** : Guidelines for Tapping Bands can be found on pages 99-100

Note:
1 Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.
2 Refer to pipe product standard for actual pipe tolerance. E.g. AS/NZS 4765 for PVC-M pipe tolerances.
3 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

Milnes® Tapping Bands for Irrigation (Polyethylene Pipe) :

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60A5020	50X20RP T/BND GM S1PVC	50	60	20	¾"
GM60C6320	63X20RP T/BND GM MDPE	63	63	20	¾"
GM60C6325	63X25RP T/BND GM MDPE	63	63	25	1"
GM60A6520	65X20RP T/BND GM S1PVC	65	75	20	¾"
GM60A6525	65X25RP T/BND GM S1PVC	65	75	25	1"
GM60A6532	65X32RP T/BND GM S1PVC	65	75	32	1 ¼"
GM60A6540	65X40RP T/BND GM S1PVC	65	75	40	¾"
GM60A8020	80X20RP T/BND GM S1PVC	80	89	20	¾"
GM60A8025	80X25RP T/BND GM S1PVC	80	89	25	1"
GM60A8032	80X32RP T/BND GM S1PVC	80	89	32	1 ¼"
GM60A8040	80X40RP T/BND GM S1PVC	80	89	40	1 ½"
GM60A8050	80X50RP T/BND GM S1PVC	80	89	50	2"
GM60C11040	110X40RP T/BND GM MDPE	110	110	40	1 ½"
GM60C11050	110X50RP T/BND GM MDPE	110	110	50	2"
GM60C12520	125X20RP T/BND GM MDPE	125	125	20	¾"
GM60C12525	125X25RP T/BND GM MDPE	125	125	25	1"
GM60C12532	125X32RP T/BND GM MDPE	125	125	32	1 ¼"
GM60C12540	125X40RP T/BND GM MDPE	125	125	40	1 ½"
GM60C12550	125X50RP T/BND GM MDPE	125	125	50	2"
GM60A15020	125X20RP T/BND GM S1PVC	125	140	20	¾"
GM60A15025	125X25RP T/BND GM S1PVC	125	140	25	1"
GM60A15032	125X32RP T/BND GM S1PVC	125	140	32	1 ¼"
GM60A15040	125X40RP T/BND GM S1PVC	125	140	40	1 ½"
GM60A15050	125X50RP T/BND GM S1PVC	125	140	50	2"
GM60C18020	180X20RP T/BND GM MDPE	180	180	20	¾"
GM60C18025	180X25RP T/BND GM MDPE	180	180	25	1"
GM60C18032	180X32RP T/BND GM MDPE	180	180	32	1 ¼"
GM60C18040	180X40RP T/BND GM MDPE	180	180	40	1 ½"
GM60C18050	180X50RP T/BND GM MDPE	180	180	50	2"
GM60A17520	175X20RP T/BND GM S1PVC	175	200	20	¾"
GM60A17525	175X25RP T/BND GM S1PVC	175	200	25	1"
GM60A17532	175X32RP T/BND GM S1PVC	175	200	32	1 ¼"
GM60A17540	175X40RP T/BND GM S1PVC	175	200	40	1 ½"
GM60A17550	175X50RP T/BND GM S1PVC	175	200	50	2"
GM60A20020	200X20RP T/BND GM S1PVC	200	225	20	¾"
GM60A20025	200X25RP T/BND GM S1PVC	200	225	25	1"
GM60A20040	200X40RP T/BND GM S1PVC	200	225	40	1 ½"
GM60A20050	200X50RP T/BND GM S1PVC	200	225	50	2"
GM60A22520	225X20RP T/BND GM S1PVC	225	250	20	¾"
GM60A22525	225X25RP T/BND GM S1PVC	225	250	25	1"
GM60A22532	225X32RP T/BND GM S1PVC	225	250	32	1 ¼"
GM60A22540	225X40RP T/BND GM S1PVC	225	250	40	1 ½"
GM60A22550	225X50RP T/BND GM S1PVC	225	250	50	2"
GM60A25020	250X20RP T/BND GM S1PVC	250	280	20	¾"
GM60A25025	250X25RP T/BND GM S1PVC	250	280	25	1"
GM60A25032	250X32RP T/BND GM S1PVC	250	280	32	1 ¼"
GM60A25040	250X40RP T/BND GM S1PVC	250	280	40	1 ½"
GM60A25050	250X50RP T/BND GM S1PVC	250	280	50	2"
GM60A30020	300X20RP T/BND GM S1PVC	300	315	20	¾"
GM60A30025	300X25RP T/BND GM S1PVC	300	315	25	1"
GM60A30040	300X40RP T/BND GM S1PVC	300	315	40	1 ½"
GM60A30050	300X50RP T/BND GM S1PVC	300	315	50	2"
GM60A37550	375X50RP T/BND GM S1PVC	375	400	50	2"



Product Specification

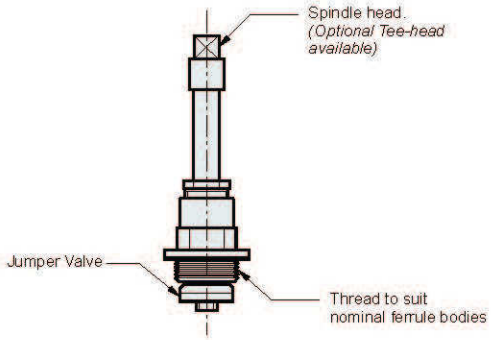
- **Application** : Mechanical tapping bands provides a means for the connection of service pipes from a pipeline
- **Suitable for** : AS/NZS 4130 MDPE & HDPE
- **Pressure Rating**: PN16
- **Metallic Material**: AS 1565 Gunmetal
- **Bolting**: 316 Stainless Steel
- **Seal**: AS 1646 EPDM
- **Installation** : Guidelines for Tapping Bands can be found on pages 99-100

Note:
1 Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.
2 Refer to pipe product standard for actual pipe tolerance. E.g. AS/NZS 4765 for PVC-M pipe tolerances.
3 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

Milnes® Pressure Tapping Ferrules

Bonnet Assembly :

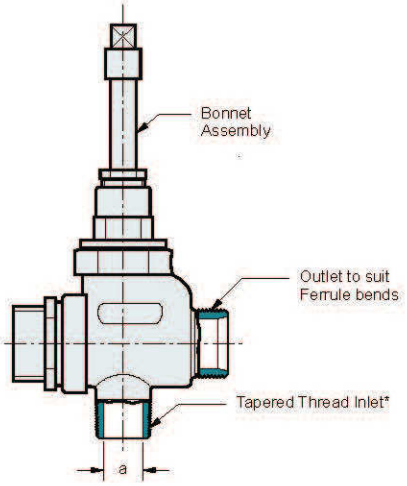
Product Code	Description	Dim. (mm) a
GM7020BA	20 TPFNR BONNET ASSY	20
GM7025BA	25 TPFNR BONNET ASSY	25
GM7032BA	32 PPFNR BONNET ASSY	32
GM7040BA	40 TPFNR BONNET ASSY	40
GM7050BA	50 TPFNR BONNET ASSY	50



Product Specification
- **Product Standard** : AS/NZS 3718
- **Pressure Rating** : PN16
- **Potable Water Compliance** : AS 4020

Pressure Tapping Ferrule with Bonnet Assembly :

Product Code	Description	Dim. (mm) a
GM7020B	20 PPFNR WITH BONNET	20
GM7025B	25 PPFNR WITH BONNET	25
GM7032B	32 PPFNR WITH BONNET	32
GM7040B	40 TPFNR WITH BONNET	40
GM7050B	50 TPFNR WITH BONNET	50

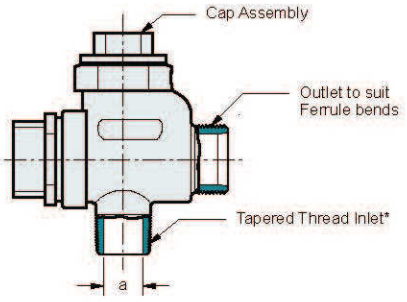


Product Specification
- **Product Standard** : AS/NZS 3718
- **Pressure Rating** : PN16
- **Potable Water Compliance** : AS 4020

Pressure Tapping Ferrules with Cap Assembly :

Product Code	Description	Dim. (mm) a
GM7020C	20 PPFNR WITH CAP	20
GM7025C	25 PPFNR WITH CAP	25
GM7032C	32 PPFNR WITH CAP	32
GM7040C	40 TPFNR WITH CAP	40
GM7050C	50 TPFNR WITH CAP	50

**Refer to thread standard Series 'R' Sealing Pipe Thread External Taper Pipe Thread. Refer to AS 1722.1 for further details*



Product Specification
- **Product Standard** : AS/NZS 3718
- **Pressure Rating** : PN16
- **Potable Water Compliance** : AS 4020

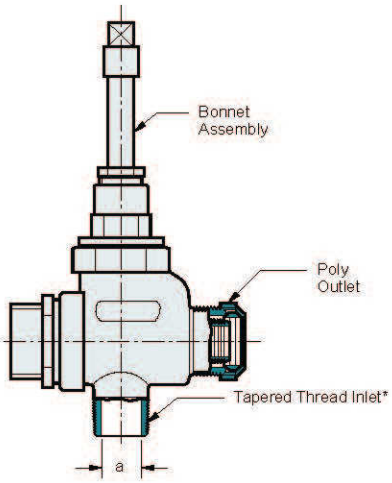
Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 101-103.

Milnes® Pressure Tapping Ferrules

Pressure Tapping Ferrules with Poly Outlet & Bonnet Assembly:

Product Code	Description	Dim. (mm) a
GM7020BP	20 PPFNR WITH BONNET POLY	20
GM7025BP	25 PPFNR WITH BONNET POLY	25

**Refer to thread standard Series 'R' Sealing Pipe Thread External Taper Pipe Thread. Refer to AS 1722.1 for further details*



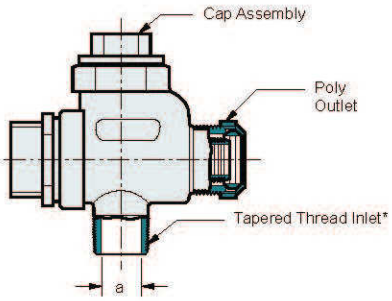
Product Specification

- **Product Standard** : AS/NZS 3718
- **Pressure Rating** : PN16
- **Potable Water Compliance** : AS 4020

Pressure Tapping Ferrules with Poly Outlet & Cap Assembly:

Product Code	Description	Dim. (mm) a
GM7020CP	20 PPFNR WITH CAP POLY	20
GM7025CP	25 PPFNR WITH CAP POLY	25

**Refer to thread standard Series 'R' Sealing Pipe Thread External Taper Pipe Thread. Refer to AS 1722.1 for further details*



Product Specification

- **Product Standard** : AS/NZS 3718
- **Pressure Rating** : PN16
- **Potable Water Compliance** : AS 4020

Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 101-103.

Milnes® Pressure Tapping Ferrules

Pressure Tapping Ferrules with Ferrule Bends Outlet & Bonnet Assembly:

Compression Bend

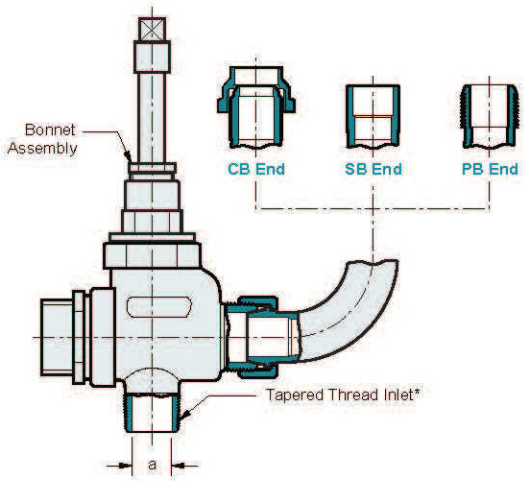
Product Code	Description	Dim. (mm) a
GM7020BCB	20 PPFNR WITH BONNET	20
GM7025BCB	25 PPFNR WITH BONNET	25
GM7032BCB	32 PPFNR WITH BONNET	32
GM7040BCB	40 TPFNR WITH BONNET	40
GM7050BCB	50 TPFNR WITH BONNET	50

Soldered Bend

Product Code	Description	Dim. (mm) a
GM7020BSB	20 PPFNR WITH BONNET	20
GM7025BSB	25 PPFNR WITH BONNET	25
GM7032BSB	32 PPFNR WITH BONNET	32
GM7040BSB	40 TPFNR WITH BONNET	40
GM7050BSB	50 TPFNR WITH BONNET	50

Plain Bend

Product Code	Description	Dim. (mm) a
GM7020BPB	20 PPFNR WITH BONNET	20
GM7025BPB	25 PPFNR WITH BONNET	25
GM7032BPB	32 PPFNR WITH BONNET	32
GM7040BPB	40 TPFNR WITH BONNET	40
GM7050BPB	50 TPFNR WITH BONNET	50



Product Specification

- **Product Standard** : AS/NZS 3718
- **Pressure Rating** : PN16
- **Potable Water Compliance** : AS 4020

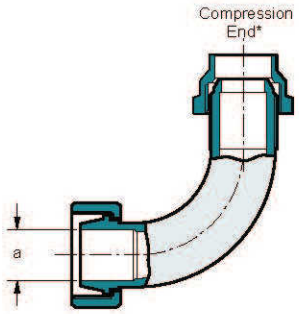
Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 101-103.

Milnes® Ferrule Bends

Compression Bend:

Product Code	Description	Dim. (mm) a
GM7020CB	20 FERRULE BEND COMP	20
GM7025CB	25 FERRULE BEND COMP	25
GM7032CB	32 FERRULE BEND COMP	32
GM7040CB	40 FERRULE BEND COMP	40
GM7050CB	50 FERRULE BEND COMP	50

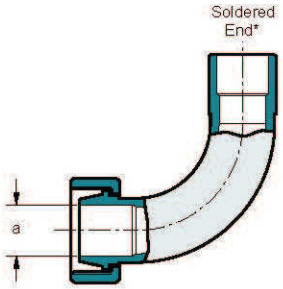
**Refer to thread standard Series 'G' Fastening Pipe Thread Internal Thread & Series 'GB' Fastening Pipe Thread External Thread class B. Refer to AS 1722.1 for further details.*



Soldered Bend:

Product Code	Description	Dim. (mm) a
GM7020SB	20 FERRULE BEND SOLDERED	20
GM7025SB	25 FERRULE BEND SOLDERED	25
GM7032SB	32 FERRULE BEND SOLDERED	32
GM7040SB	40 FERRULE BEND SOLDERED	40
GM7050SB	50 FERRULE BEND SOLDERED	50

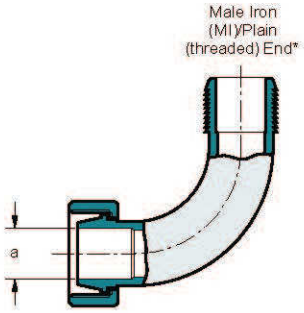
**Refer to Internal Diameter of Soldered Ends of Ferrule Bends Table for further details.*



Plain Bend:

Product Code	Description	Dim. (mm) a
GM7020PB	20 FERRULE BEND MI	20
GM7025PB	25 FERRULE BEND MI	25
GM7032PB	32 FERRULE BEND MI	32
GM7040PB	40 FERRULE BEND MI	40
GM7050PB	50 FERRULE BEND MI	50

**Refer to thread standard Series 'R' Sealing Pipe Thread External Taper Pipe Thread. Refer to AS 1722.1 for further details.*



Product Specification

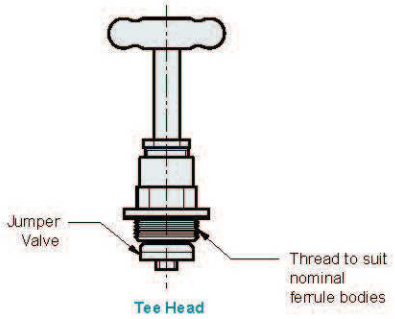
- **Application**: Compression end suitable for copper pipe to AS 1432
  Soldered end suitable for copper pipe to AS 1432
  Plain end suitable for connection via Series 'R' sealing pipe thread external taper pipe thread – AS 1722.1
- **Product Standard:** AS 3688
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020
- **Installation:** Guidelines for Ferrule Bends connection ends can be found on pages 102-103

Note: The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

Milnes® Standard Ferrules

Bonnet Assembly:

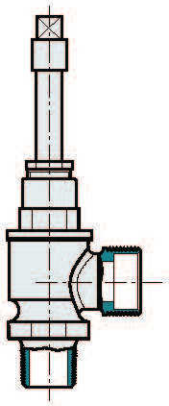
Product Code	Description	Dim. (mm) a
GM71B20	20 TEE HEAD BONNET ASSY	20
GM71B25	25 TEE HEAD BONNET ASSY	25



Product Specification
- **Product Standard:** AS/NZS 3718
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Standard Ferrule:

Product Code	Description	Dim. (mm) a
GM7120	20 FERRULE STD	20
GM7125	25 FERRULE STD	25
GM7132	32 FERRULE STD	32
GM7140	40 FERRULE STD	40
GM7150	50 FERRULE STD	50



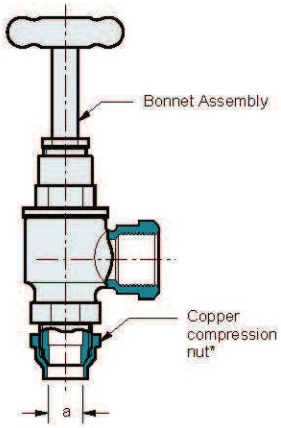
Product Specification
- **Product Standard:** AS/NZS 3718
- **Pressure Rating:** PN16

Milnes® Stop Tap Meters

Right Angle Stop Tap Meter:

Product Code	Description	Dim. (mm) a
GM7020PB	20 FERRULE BEND MI	20
GM7025PB	25 FERRULE BEND MI	25
GM7032PB	32 FERRULE BEND MI	32
GM7040PB	40 FERRULE BEND MI	40
GM7050PB	50 FERRULE BEND MI	50

**Refer to thread standard Series 'G' Fastening Pipe Thread Internal Thread & Series 'GB' Fastening Pipe Thread External Thread Class B. Refer to AS 1722.1 for further details.*



Product Specification
- **Product Standard:** AS/NZS 3718
- **Pressure Rating:** PN16

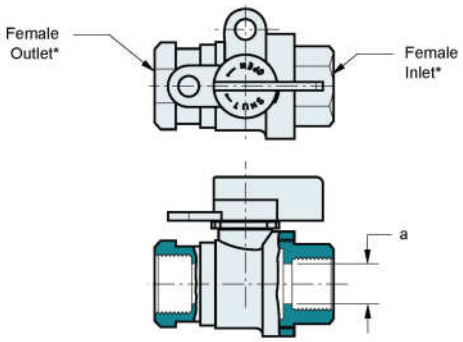
Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 102-103.

Milnes® Ball Valves

Inline Ball Valve Female – Female:

Product Code	Description	Dim. (mm) a
GM7620	20 BALL VALVE INLINE FI/FI	20
GM7625	25 BALL VALVE INLINE FI/FI	25

**Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.*



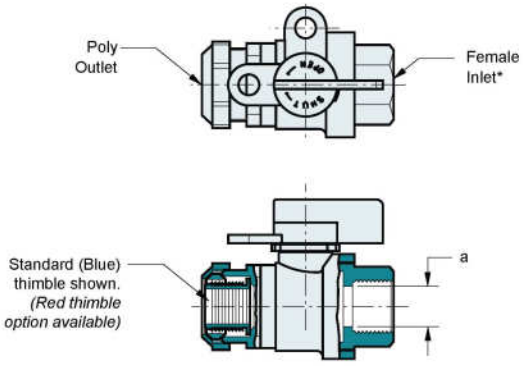
Standard lockable handle shown

Product Specification
- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Inline Ball Valve Female – Poly:

Product Code	Description	Dim. (mm) a
GM7620P	20 BALL VALVE INLINE FI/PE	20
GM7625LP	25 BALL VALVE INLINE FI/PE	25
GM7620PR	20 BALL VALVE INLINE FI/PE LILAC HANDLE	20

**Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.*

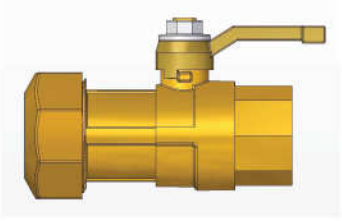


Standard lockable handle shown

Product Specification
- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Inline Ball Valve Female Poly Push-in:

Product Code	Description	Dim. (mm) a
GM7620PN	20 BALL VALVE INLINE FI/PE	20
GM7620PRN	20 BALL VALVE INLINE FI/PE LILAC HANDLE	20



Product Specification
- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 102-103.

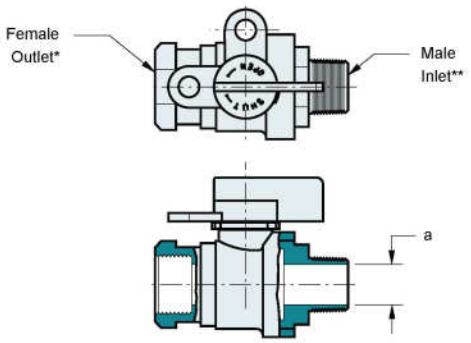
Milnes® Ball Valves

Inline Ball Valve Male-Female:

Product Code	Description	Dim. (mm) a
GM76A20	20 BALL VALVE INLINE MI/FI	20
GM76A20LRW	20 BALL VALVE INLINE MI/FI LILAC HANDLE	20
GM76A25	25 BALL VALVE INLINE MI/FI	25

**Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS1722.1 for further details*

***Refer to thread standard Series 'R' Sealing Pipe Thread External Tape Pipe Thread. Refer to AS1722.1 for further details*



Standard lockable handle shown

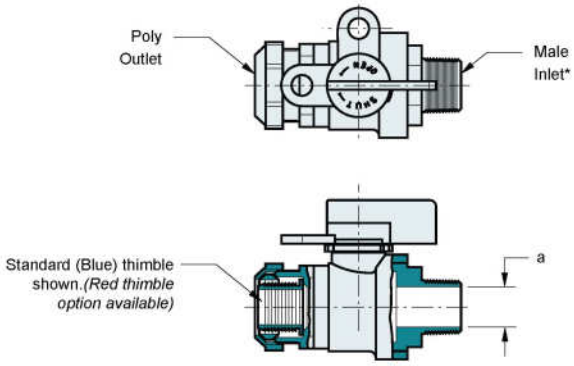
Product Specification

- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Inline Ball Valve Male – Poly:

Product Code	Description	Dim. (mm) a
GM76A20P	20 BALL VALVE INLINE MI/PE	20
GM76A20PR	20 BALL VALVE INLINE MI/PE LILAC HANDLE	20

**Refer to thread standard Series 'R' Sealing Pipe Thread External Tape Pipe Thread. Refer to AS1722.1 for further details.*



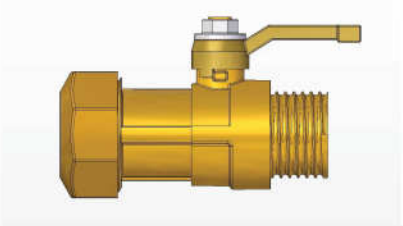
Standard lockable handle shown

Product Specification

- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Inline Ball Valve Male – Poly Push-in:

Product Code	Description	Dim. (mm) a
GM76A20PN	20 BALL VALVE INLINE MI/PE	20
GM76A20PRN	20 BALL VALVE INLINE MI/PE LILAC HANDLE	20



Product Specification

- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

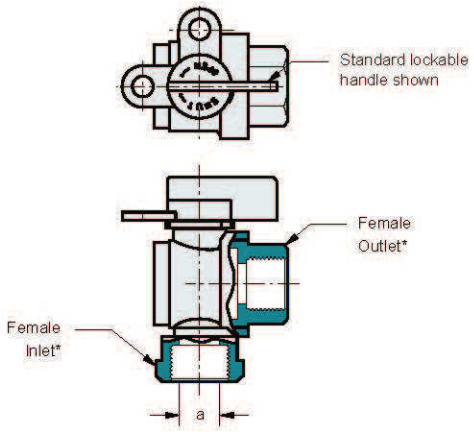
Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 102-103.

Milnes® Ball Valves

Right Angle Ball Valve Female – Female:

Product Code	Description	Dim. (mm) a
GM7720	20 BALL VALVE R/ANGLE FI/FI	20
GM7725	25 BALL VALVE R/ANGLE FI/FI	25

**Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details.*



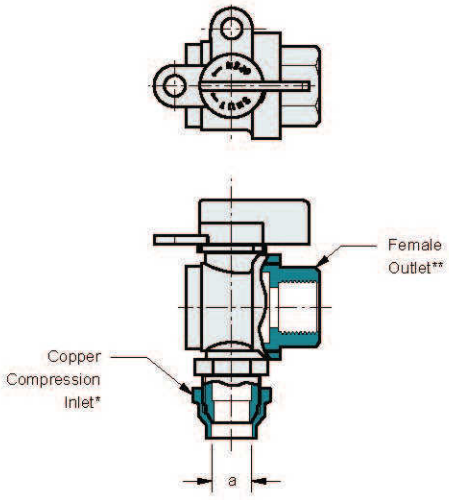
Product Specification
- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Right Angle Ball Valve Copper Compression – Female:

Product Code	Description	Dim. (mm) a
GM7720CL	20 BALL VALVE R/ANGLE CU/FI	20
GM7725CL	25 BALL VALVE R/ANGLE CU/FI	25

**Refer to thread standard Series 'G' Fastening Pipe Thread Internal Thread & Series 'GB' Fastening Pipe Thread External Thread Class B.*

***Refer to thread standard Series 'RP' Sealing Internal Parallel Thread. Refer to AS 1722.1 for further details*



Standard lockable handle shown

Product Specification
- **Product Standard:** AS/NZS 4796
- **Pressure Rating:** PN16
- **Potable Water Compliance:** AS 4020

Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 102-103.

Milnes® Valve Kits

20mm Tapping Set Ball Valve Kit - Without Termination Box:

Product Code	Description	Kit Includes
GM78A20A	20 TAPPING SET BALL VALVE VIC WITHOUT TERMINATION BOX	GM7620P – 20mm Inline Ball Valve FI/PE GM76A20P – 20mm Inline Ball Valve MI/PE
GM78A20AP	20 TAPPING SET BALL VALVE VIC LILAC HANDLE - RECYCLED WATER	GM7620LP – 20mm Inline Ball Valve FI/PE Lilac Handle GM76A20PR – 20mm Inline Ball Valve MI/PE Lilac Handle

20mm Tapping Set Ball Valve Kit - Without Termination Box (Push-in):

Product Code	Description	Kit Includes
GM78A20AN	20 TAPPING SETBALL VALVE VIC DR - WITHOUT TERMINATION BOX	GM7620PN – 20mm Inline Ball Valve FI/PE Push-in GM76A20PN – 20mm Inline Ball Valve MI/PE Push-in
GM78A20APN	20 TAPPING SET BALL VALVE VIC DR -LILAC HANDLE-RECYCLEDWATER	GM7620PRN – 20mm Ball Valve FI/PE Push-in Lilac Handle GM76A20PRN – 20mm Ball Valve MI/PE Push-in Lilac Handle

20mm Poly Ball Valve Kit:

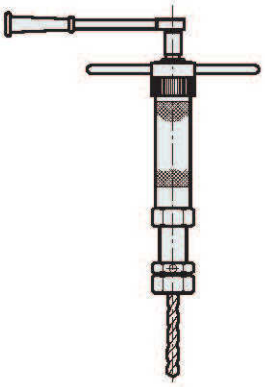
Product Code	Description	Kit Includes
GM79A20CRQ	20 POLY BALL VALVE KIT	GM7620P – 20mm Inline Ball Valve FI/PE GM76A20P – 20mm Inline Ball Valve MI/PE 25mm Thimble RT2 (not available as a separate item – Kit only)

Note: 1 The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.
2 Installation guidelines for Tapping Ferrules and connection ends can be found on pages 101-103.

Milnes® Accessories

Norcast Tapping Machine:

Product Code	Description	Tapping Sizes					
		15mm	20mm	25mm	32mm	40mm	50mm
C2191.05	Norcast Service Tapping Machine	✓	✓	✓	✗	✗	✗
C2191.06	Norcast Super Tapping Machine	✗	✗	✗	✓	✓	✓



Product Specification

- This is a hand-operated machine designed to facilitate the tapping of service connections in pressurised water mains without interruption to the service. Three Gunmetal Adaptors are supplied with the machine to suit the variations in tapping sizes as well as two masonry drills which are suitable for tapping A.C., C.I. and D.I. pipes. Fluted hole drills are available for use with P.E. and P.V.C. pipes.
- Replacement drill bits are available on request.

'O' Ring Seal Replacement:

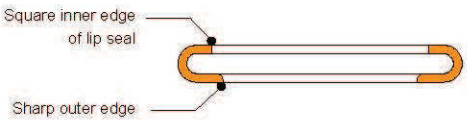
Product Code	Description	Suits Tapping Size
GMOR60038	38 X 8 Nitrile 'O' Ring	15
GMOR60041	41 X 8.5 Nitrile 'O' Ring	20,25 & 32
GMOR60062	62 x 11 Nitrile 'O' Ring	40 &50

Product Specification

- For tapping bands to suit pipe up to nominal 200mm outside diameter only. If the nominal pipe outside diameter is 200mm or greater then use 'O' ring seal replacement **GMOR60062** regardless of the tapping size.

Lip Seal Replacement:

Product Code	Description	Suits Tapping Size
GMOR60780	Small EPDM Lip Seal	20,25 & 32
GMOR60790	Large EPDM Lip Seal	40 & 50



Product Specification

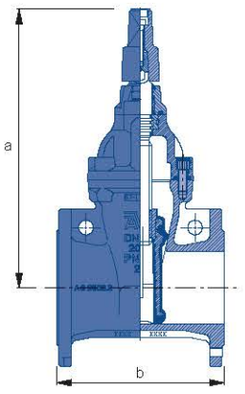
- For tapping bands to suit pipe up to nominal 200mm outside diameter only. If the nominal pipe outside diameter is 200mm or greater then use 'O' ring seal replacement **GMOR60790** regardless of the tapping size.

Note: The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

Resilient Seated Valves (Flange) PN16:

DN	Product Codes		Dim. (mm) a	Dim. (mm) b
	Anti-Clockwise Closing[1]	Clockwise Closing[1]		
50	C523.05	C523.05C	335	178
65	C523.06	C523.06C	344	190
80	C523.08	C523.08C	350	203
100	C523.10	C523.10C	380	229
150	C523.15	C523.15C	485	267
200	C523.20	C523.20C	595	292
225	C523.22	C523.22C	595	305
250	C523.25	C523.25C	680	330
300	C523.30	C523.30C	755	356
375	C523.37	C523.37C	905	381
400	C523.40	C523.40C	930	406
450	C523.45SL	C523.45SLC	1130	432
500	C523.50SL	C523.50SLC	1206	457
600	C523.60SL	C523.60SLC	1329	508

[1] Compatible with PN16 Flange



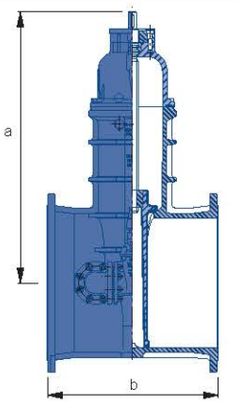
Product Specification

- **Application** : water, sewerage and neutral liquid applications
- **Standards** : Face to face dimensions to AS 2638.2
  Flange and drilling to AS/NZS 4087 Figure B5
  (AS 2127 Table D)

Resilient Seated Valves with By-pass Fitted (Flange):

DN	Product Codes		Dim. (mm) a	Dim. (mm) b
	Anti-Clockwise Closing with DN80 by-pass assembly[1]	Clockwise Closing with DN80 by-pass assembly[1]		
450	C523.45B	C523.45BC	1130	650
500	C523.50B	C523.50BC	1130	700
600	C523.60B	C523.60BC	1270	800
600	C523.60B15[2]	C523.60B15C[2]	1740	785

[1] Compatible with PN16 Flange
[2] DN150 by-pass assembly

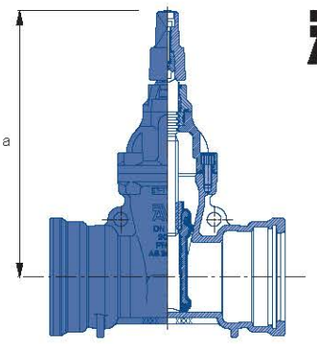


Product Specification

- **Application** : For water, neutral liquids and waste water
- **Standards** : Flange drilling to AS/NZS 4087 Fig. B5

Resilient Seated Valves (Socket) PN16:

DN	Product Codes		Dim. (mm) a
	Anti-Clockwise Closing	Clockwise Closing	
100	C521.10	C521.10C	380
150	C521.15	C521.15C	485
200	C521.20	C521.20C	595
225	C521.22	C521.22C	595
250	C521.25	C521.25C	680
300	C521.30	C521.30C	755
375	C521.37	C521.37C	905



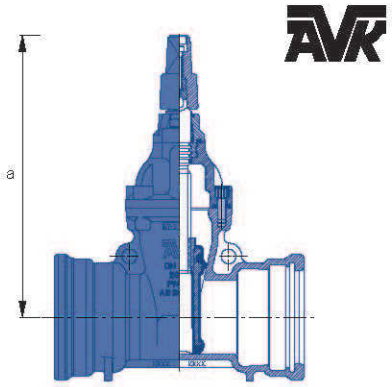
Product Specification

- **Application** : For water, sewerage and neutral liquid
- **Standards** : To AS 2638.2

Note:
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. Valve stem cap colour for Anti-clockwise Closing Valves is white and red for Clockwise Closing Valves.
4. Refer to www.iplex.com.au for individual product specification sheets.

Resilient Seated Valves (Socket) PN16:

DN	Product Codes		Dim. (mm) a
	Anti-Clockwise Closing Series 1 PN16	Clockwise Closing Series 1 PN16	
80	C522.08	C522.08C	350
100	C522.10	C522.10C	380
150	C522.15	C522.15C	485
200	C522.20	C522.20C	595
225	C522.22	C522.22C	595
250	C522.25	C522.25C	680
300	C522.30	C522.30C	755
375	C522.37	C522.37C	905

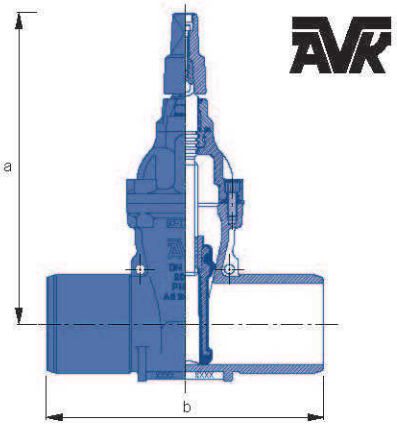


Product Specification

- **Application** : Water, sewerage and neutral liquid
- **Standards** : AS 2638.2

Resilient Seated Valves (Spigot) PN16:

DN	Product Codes		Dim. (mm) a	Dim. (mm) b
	Anti-Clockwise Closing DICL PN16	Clockwise Closing DICL PN16		
100	C524.10	C524.10C	380	340
150	C524.15	C524.15C	485	380
200	C524.20	C524.20C	595	440



Product Specification

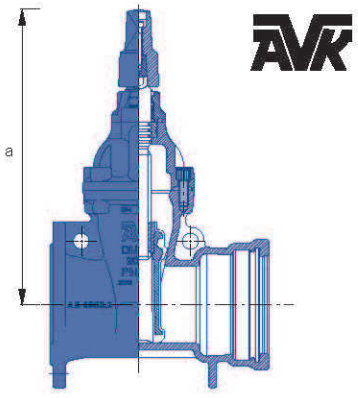
- **Application** : Water, sewerage and neutral liquid
- **Standards** : AS 2638.2

Resilient Seated Valves (Socket - Flange) PN16:

DN	Product Codes		Dim. (mm) a
	Anti-Clockwise Closing Series 2[1]	Clockwise Closing Series 2[1]	
80	C5213.08	C5213.08C	350
100	C5213.10	C5213.10C	380
150	C5213.15	C5213.15C	485

DN	Product Codes		Dim. (mm) a
	Anti-Clockwise Closing Series 1[1]	Clockwise Closing Series 1[1]	
80	C5223.08	C5223.08C	350
100	C5223.10	C5223.10C	380
150	C5223.15	C5223.15C	485

[1] Compatible with PN16 Flange



Product Specification

- **Application** : Water, sewerage and neutral liquids
- **Standards** : Socket to AS/NZS 2280/AS 1477 Type 2 or AS 1477 Type 1 Flange drilling AS/NZS 4087 Fig.B5 / Table D

Note:

1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. Valve stem cap colour for Anti-clockwise Closing Valves is white and red for Clockwise Closing Valves.
4. Refer to www.iplex.com.au for individual product specification sheets.

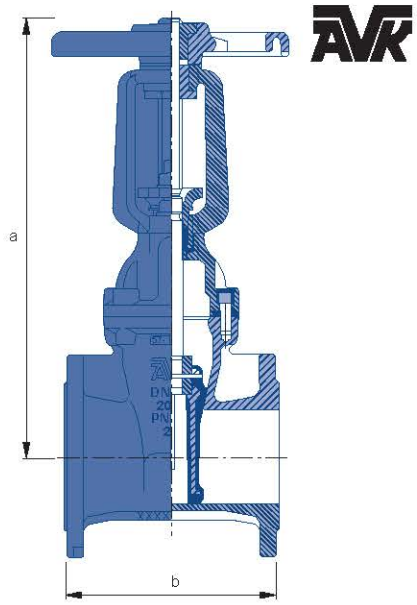
Resilient Seated Gate Valve – OS + Y (Outside screw and yolk):

DN	Product Code Clockwise Closing[1]	Dim. (mm) a	Dim. (mm) b
65	C5031.06C	344	190
80	C5031.08C	350	203
100	C5031.10C	420	229
150	C5031.15C	581	267
200	C5031.20C	736	292
250	C5031.25C	882	330
300	C5031.30C	1009	356

DN	Product Code Clockwise Closing[2]	Dim. (mm) a	Dim. (mm) b
100	C5031.10CE	420	229
150	C5031.15CE	581	267
200	C5031.20CE	736	292
250	C5031.25CE	882	330
300	C5031.30CE	1009	356

[1] Compatible with PN16 Flange
[2] Compatible with Table E Flange

Product Specification
- **Application** : Water, sewerage and neutral liquid
- **Standard** : Face to face dimension to AS 2638.2 Flanges to AS 2129 Table E*

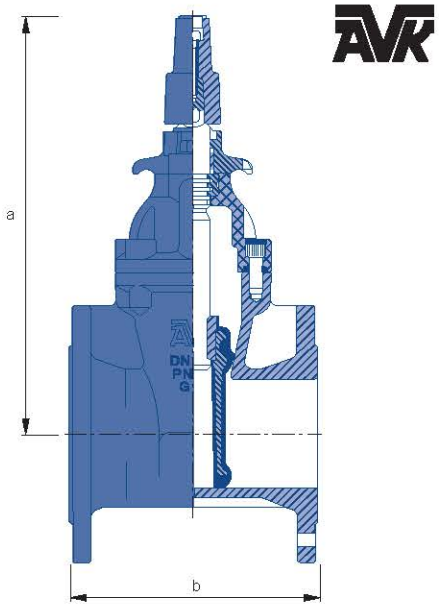


Resilient Seated Valves (Flange – Flange) PN25:

DN	Product Codes Anti-Clockwise Closing[1]	Product Codes Clockwise Closing[1]	Dim. (mm) a	Dim. (mm) b
80	C5231.08	C5231.08C	350	203
100	C5231.10	C5231.10C	380	229
150	C5231.15	C5231.15C	485	267
200	C5231.20	C5231.20C	595	292
250	C5231.25	C5231.25C	680	330
300	C5231.30	C5231.30C	755	356

[1] Compatible with PN25 Flange

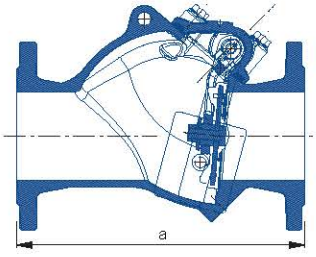
Product Specification
- **Application** : Water, sewerage and neutral liquid
- **Standard** : Face to face dimension to AS 2638.2 Flanges to AS 2129 Table F



Non Return Valves / Check Valves (Flange Resilient Seated) PN16:

DN	Produce Codes Free Acting[1]	Produce Codes with Counter weight[1]	Dim. (mm) a
80	C55331.08	C55332.08	260
100	C55331.10	C55332.10	330
150	C55331.15	C55332.15	410
200	C55331.20	C55332.20	540
250	C55331.25	C55332.25	640
300	C55331.30	C55332.30	700

[1] Compatible with PN16 Flange
Limit Switch can be fitted upon request



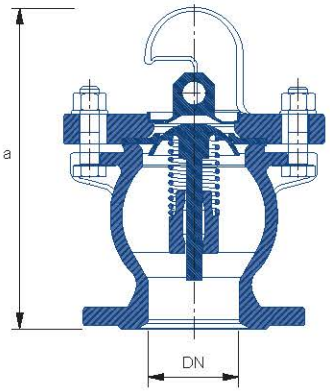
Product Specification
- **Application** : Portable water and sewage application
- **Standard** : AS 4794

Note:
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. Valve stem cap colour for Anti-clockwise Closing Valves is white and red for Clockwise Closing Valves.
4. Refer to www.iplex.com.au for individual product specification sheets.

DN80 Spring Hydrant Valves:

DN	Product Codes		Dim. (mm) a
	Spring Hydrant[1]	SWAB Spring Hydrant[1]	
80	C141.08	C141.08SW	280
80	C141.10	C141.10SW	280

[1] Compatible with PN16 Flange, 316 Stainless Steel Bolting



Product Specification

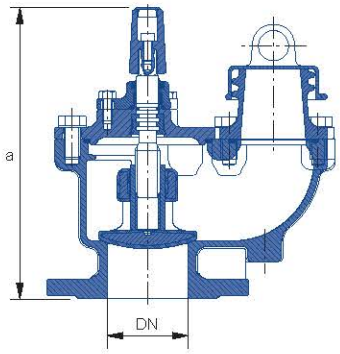
- **Application** : Water and neutral liquid
- **Standards** : AS 3952
- For NT, SA and WA Hydrant Valves refer to Hydrant Control Valves below

Hydrant Control Valves:

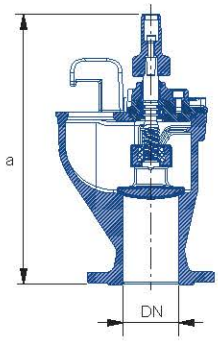
DN	Product code	Region	H (mm)
80	C1476.08	General ACC	334
80	C1476.08C	General CC	334
100	C1476.10	General ACC	334
100	C1476.10C	General CC	334
80	C1461.08	NT	-
80	C145.08C	SA	392
100	C145.08	WA	288

Product Specification

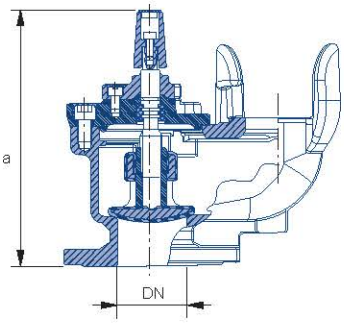
- **Application** : Water and neutral liquid



NT Style depicted



SA Style depicted



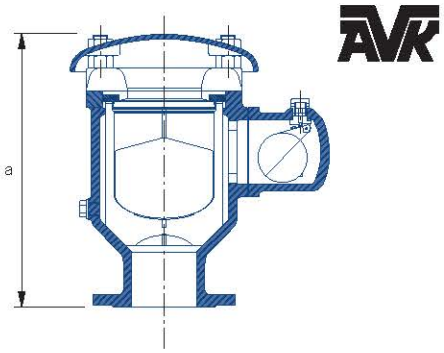
WA Style depicted

Note:
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. Refer to www.iplex.com.au for individual product specification sheets.

Air Valve Double Orifice:

PN16 Rated

DN	Product code	Dim. (mm) a
50	C5404.050	256
80	C5404.080	327
100	C5404.100	410
150	C5404.150	410



Product Specification

- **Application** : Water (not sewage) and neutral liquid
- **Standards** : AS/NZS 4087 fig.B5

PN25 Rated

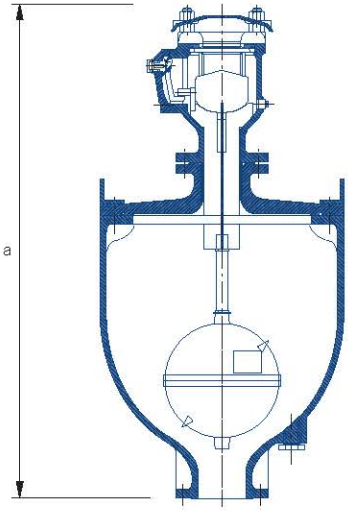
DN	Product code	Dim. (mm) a
50	C5405.050F	256
80	C5405.080F	327
100	C5405.100F	410
150	C5405.150F	410

Product Specification

- **Application** : Water (not sewage) and neutral liquid
- Flange drilling AS 2129 Table F

Sewage Air Release Valve Double Orifice PN16:

DN	Product code	Dim. (mm) a
80	C5404.080S	1063



Product Specification

- **Application** : For sewage, raw water, brine and sludge
- Ductile Iron body & ABS plastic internals
- Flange drilled to AS/NZS 4087 fig.B5

Air Valves

Under normal circumstances air will collect at high points in a pipeline system. As air accumulates, it has the effect of lessening the effective pipe diameter, thereby leading to reduced discharge or increased friction. Pressure surges of high magnitude may also occur.

An air valve is comprised of a buoyant ball confined with an orifice to atmosphere at the top and connection to the pipeline at the bottom. When the chamber is full of water the ball seals the orifice, but when the pressure drops below atmospheric the ball drops to allow air into the line. It remains open until water refills the chamber.

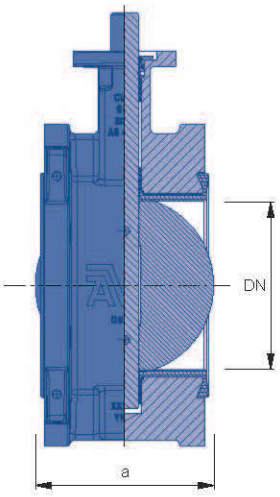
The air periodically released from solution by temperature changes and movements etc, will accumulate in all the peaks of the pipeline. Therefore even changes in elevation should be laid evenly to grade between peaks to ensure that all possible locations or potential air pockets are known.

Air valves are required at such peaks to allow gasses to escape gradually, avoiding unnecessary pressure surges. Such peaks are located by reference to the hydraulic gradient and not the horizontal datum.

Note:
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. Refer to www.iplex.com.au for individual product specification sheets.

Butterfly Valves PN16:

DN	Product Codes		Dim. (mm) a
	Double Flange Bare Shaft PN16	Double Flange With Gear Box PN16	
80	C5858.08	C5858.08G	350
100	C5858.10	C5858.10G	380
150	C5858.15	C5858.15G	485
200	C5858.20	C5858.20G	595
225	C5858.22	C5858.22G	595
250	C5858.25	C5858.25G	680
300	C5858.30	C5858.30G	755
375	C5858.37	C5858.37G	905



Product Specification

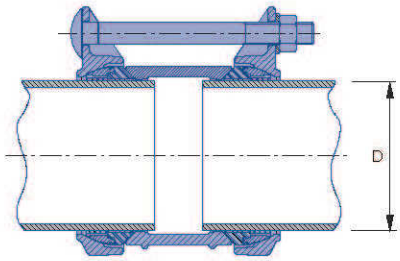
- **Application** : Water and neutral liquids
- **Standards** : AS 4795

Note:

1 All dimensions are in accordance with AS/NZS 2280, where applicable.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3 Refer to www.iplex.com.au for individual product specification sheets.

Supa Plus - PE Tensile Coupling - PN16:

D (PE-OD)	Product Code	Description 1	Description 2
40	C32621.40PE	40PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
50	C32621.50PE	50PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
63	C32621.63PE	63PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
75	C32621.75PE	75PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
90	C32621.90PE	90PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
110	C32621.110PE	110PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
125	C32621.125PE	125PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
140	C32621.140PE	140PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
160	C32621.160PE	160PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
180	C32621.180PE	180PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
200	C32621.200PE	200PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
225	C32621.225PE	225PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
250	C32621.250PE	250PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
280	C32621.280PE	280PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16
315	C32621.315PE	315PE COUPLING PE TENSILE	FBE SERIES 621/10 PN16

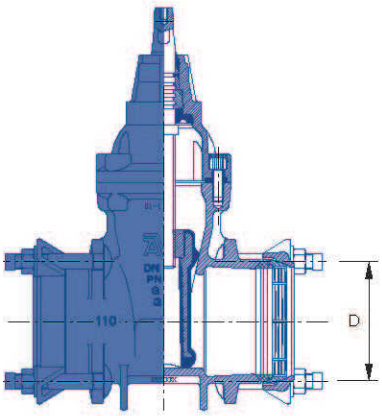


Product Specification

- **Application** : Water and neutral liquids
- Series OS Support bushes need to be used with these couplers.

Supa Plus - Resilient Seated Gate Valve comes with Tensile Resistant Ends - PN16:

D (PE-OD)	Product Code	Description 1	Description 2
50	C5261.50PEC	50PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
63	C5261.63PEC	63PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
75	C5261.75PEC	75PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
90	C5261.90PEC	90PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
110	C5261.110PEC	110PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
125	C5261.125PEC	125PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
140	C5261.140PEC	140PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
160	C5261.160PEC	160PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
180	C5261.180PEC	180PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
200	C5261.200PEC	200PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
225	C5261.225PEC	225PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
250	C5261.250PEC	250PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
280	C5261.280PEC	280PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
315	C5261.315PEC	315PE VALVE RS GATE CC	FBE SERIES 01/70 SUPA PLUS PN16
50	C5261.50PE	50PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
63	C5261.63PE	63PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
75	C5261.75PE	75PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
90	C5261.90PE	90PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
110	C5261.110PE	110PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
125	C5261.125PE	125PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
140	C5261.140PE	140PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
160	C5261.160PE	160PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
180	C5261.180PE	180PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
200	C5261.200PE	200PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
225	C5261.225PE	225PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
250	C5261.250PE	250PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
280	C5261.280PE	280PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16
315	C5261.315PE	315PE VALVE RS GATE ACC	FBE SERIES 01/70 SUPA PLUS PN16



Product Specification

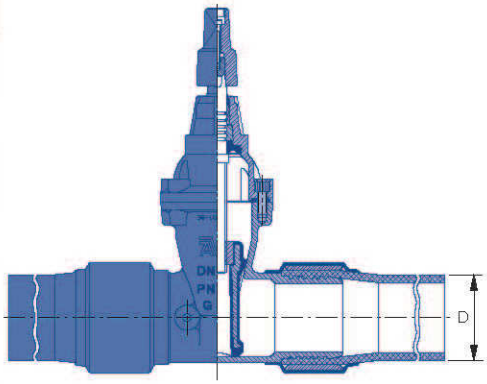
- **Application** : Water, sewage and neutral liquids
- Series OS Support bushes are recommended when using polyethylene pipe systems

Note:

1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.
3. Refer to www.iplex.com.au for individual product specification sheets.

Resilient Seated Gate Valves - with PE ends for Fusion or Butt Welding - PN16:

D (PE-OD)	Product Code	Description 1	Description 2
75	C527.75PEC	75PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
75	C527.75PE	75PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
90	C527.90PEC	90PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
90	C527.90PE	90PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
110	C527.110PEC	110PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
110	C527.110PE	110PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
125	C527.125PEC	125PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
125	C527.125PE	125PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
160	C527.160PEC	160PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
160	C527.160PE	160PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
180	C527.180PEC	180PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
180	C527.180PE	180PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
200	C527.200PEC	200PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
200	C527.200PE	200PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
225	C527.225PEC	225PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
225	C527.225PE	225PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
250	C527.250PEC	250PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
250	C527.250PE	250PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
280	C527.280PEC	280PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
280	C527.280PE	280PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
315	C527.315PEC	315PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
315	C527.315PE	315PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/CAP
75	C527.75PEHC	75PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
75	C527.75PEH	75PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
90	C527.90PEHC	90PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
90	C527.90PEH	90PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
110	C527.110PEHC	110PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
110	C527.110PEH	110PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
140	C527.125PEHC	125PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
140	C527.125PEH	125PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
160	C527.160PEHC	160PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
160	C527.160PEH	160PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
180	C527.180PEHC	180PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
180	C527.180PEH	180PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
200	C527.200PEHC	200PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
200	C527.200PEH	200PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
225	C527.225PEHC	225PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
225	C527.225PEH	225PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
250	C527.250PEHC	250PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
250	C527.250PEH	250PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
280	C527.280PEHC	280PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
280	C527.280PEH	280PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW
315	C527.315PEHC	315PE VALVE RS GATE CC	FBE SERIES 36/80 PE ENDS PN16 W/HW
315	C527.315PEH	315PE VALVE RS GATE ACC	FBE SERIES 36/80 PE ENDS PN16 W/HW

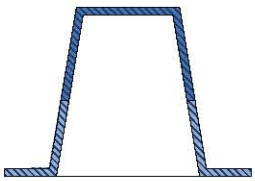


Product Specification

- **Application** : Water, sewage and neutral liquid
- **Standard** : AS 2638.2

Valve Covers – Gate "Sluice" and Surrounds:

Region	Code	Description
QLD	GM300SVLQ	Valve box & surround (complete)
	C9722.10	Plastic surround
	C9722.04	Concrete surround
NSW	C9723.PSVY	Valve box & surround (complete)
VIC	C9723.01	Valve box & CI cover (complete)
	C9711.13	Valve box grey round surround & CI lid (complete)
	C9723.VSSM	Valve surround
SA	C9710.5680006	Cover
	C9710.56800065	Lid
	C9710.56800061	Chamber
	C9710.56800049	Concrete ring
WA	C9713.22	Lightweight valve box only
	C9712.06	Lightweight lid only
	C9724.01	Heavy duty CI Conical Cover
	C9724.02	Concrete surround
	DSSH225T	Shroud
	C9711.09H	Flange
NT	C9725.01	Valve box (complete)



Note: For other state specific covers, contact Iplex Pipelines.

Hydrant Covers and Surrounds:

Region	Code	Description
QLD	GM301SHLQ	Hydrant box & cover (complete)
	C9712.12	Plastic surround
	C9712.07	Concrete surround
NSW	C9713.PHLY	Hydrant box & surround (complete)
VIC	C9221.01TK	Hydrant box & CI cover (complete)
	C9711.12	Hydrant box grey square surround & CI lid (complete)
	C9712.07	Hydrant surround
SA	C9710.5680006	Cover
	C9710.56800065	Lid
	C9710.56800061	Chamber
	C9710.56800049	Concrete ring
WA	C9714.HYDASSY	Lightweight hydrant box & cover (complete)
	C9714.01	Heavy duty hydrant box & lid
	C9714.02	Hydrant Surround
NT	C9715.01	Hydrant box (complete)

Note: For other state specific covers, contact Iplex Pipelines.

Valve Extension Spindles:

Valve Size DN	Product Codes		Extension Length (mm)
	Bitumen Dipped	Galvanised Steel	
80 - 500	C591.0150	C591.150G	150
80 - 500	C591.0150WA	-	150
80 - 500	C591.0225	C591.225G	225
80 - 500	C591.0300	C591.300G	300
80 - 500	C591.0300WA	-	300
80 - 500	C591.0375	C591.375G	375
80 - 500	C591.0375WA	-	375

Note: Other valve extention spindles and valve keys available.

Hand Wheels:

PN 16 Rated

Valve Size DN	Product Codes	
	Anti-Clockwise ACC Closing	Clockwise CC Closing
50 - 100	C5921.0510L	C5921.0510LC
150	C5921.15L	C5921.15LC
200	C5921.20L	C5921.20LC
225 - 300	C5921.2230L	C5921.2230LC

PN 25 Rated

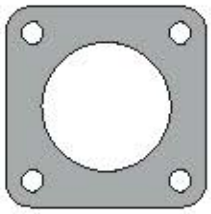
Valve Size DN	Product Codes	
	Anti-Clockwise ACC Closing	Clockwise CC Closing
50 - 100	C5921.0810	C5921.0810C
150	C5921.15	C5921.15C
200 - 300	C5921.2030	C5921.2030C
375 - 400*	C5921.3740	C5921.3740C
450 - 600*	C5921.4560	C5921.4560C

** PN35 and Table E available upon request*

Square Gasket Sets:

DN	Product Codes	
	EPDM Square Gaskets with Galvanized Bolt Sets[1]	EPDM Square Gaskets with 316 S/S Bolt Sets[1]
80	C901.08SQ	C902.08SQ
100	C901.10SQ	C902.10SQ

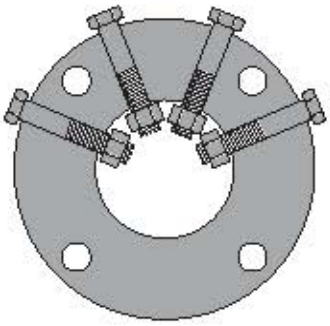
[1] *Rated at PN16*



Gasket and Bolt sets:

DN	Product Codes	
	EPDM Full Face Gaskets with Galvanized Bolt Sets[1]	EPDM Full Face Gaskets with 316 S/S Bolt Sets[1]
80	C901.08	C902.08
100	C901.10	C902.10
150	C901.15	C902.15
200	C901.20	C902.20
225	C901.22	C902.22
250	C901.25	C902.25
300	C901.30	C902.30
375	C901.37	C902.37
450	C901.45	C902.45
500	C901.50	C902.50
600	C901.60	C902.60
750	C901.75	C902.75

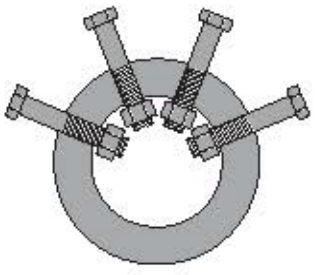
[1] *Rated at PN16*
** PN35 and Table E available upon request*
*** For bolt dimensions refer to page 11*



Full Face Kit

DN	Product Codes	
	EPDM Narrow Face Gaskets with Galvanized Bolt Sets[1]	EPDM Narrow Face Gaskets with 316 S/S Bolt Sets[1]
80	C9011.08	C9021.08
100	C9011.10	C9021.10
150	C9011.15	C9021.15
200	C9011.20	C9021.20
225	C9011.22	C9021.22
250	C9011.25	C9021.25
300	C9011.30	C9021.30

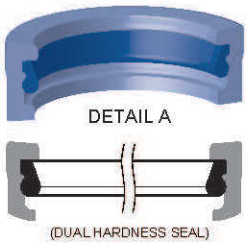
[1] *Rated at PN16*
** PN35 and Table E available upon request*
*** For bolt dimensions refer to page 11*



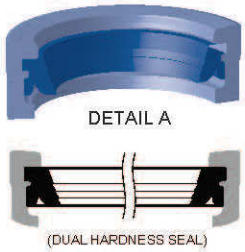
Narrow Face Kit

Standard DI Socket Seals and Conversion Seals (Series 2 to Series 1 sizes):

DN	Product Codes	
	DI Socket Seals Series 2 & DICL	DI Socket Conversion Seals Series 2 to Series 1 PVC PN12
80	C9615.08	-
100	C9615.10	C9615.10A
150	C9615.15	C9615.15A
200	C9615.20	C9615.20A
225	C9615.22	C9615.22A
250	C9615.25	C9615.25A
300	C9615.30	-
375	C9615.37	-
450	C9615.45	-
500	C9615.50	-
600	C9615.60	-
750	C9615.75	-



C9615._ _
STANDARD SEAL
SERIES 2 (BLUE) PVC, GRP, AC OR DICL

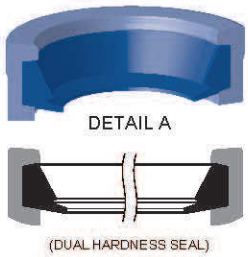


C9615._ _A
CONVERSION SEAL
SERIES 1 (WHITE) PVC

(Ø100-250, Ø375-450mm)

Griptite® Socket Seals:

DN	Product Code Griptite® Socket Seals DICL & Series 2 PVC
80	C9611.08
100	C9611.10
150	C9611.15
200	C9611.20
225	C9611.22
250	C9611.25
300	C9611.30
375	C9611.37
450	C9611.45
500	C9611.50
600	C9611.60
750	C9611.75

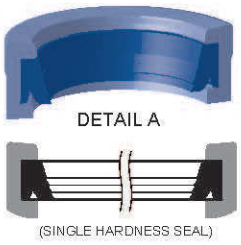


C9611._ _
GRIPTITE® SEAL
DICL, AC OR SERIES 2 (BLUE) PVC

(Ø80-750mm)

Nortite® Socket Seals:

DN	Product Code Nortite® Socket Seals Series 1 PVC
80	C9612.08
100	C9612.10
150	C9612.15
200	C9612.20
225	C9612.22
250	C9612.25
300	C9612.30
375	C9612.37
575	C9612.57



C9612._ _
NORTITE® SEAL
SERIES 1 (WHITE) PVC

(Ø80-375mm)

Stainless Steel Repair & Tapping Clamps:

DN	Product Codes		Series 1 White	Series 2 Blue PVC	Hobas	DICL	Steel	AC	Typical Clamp Range OD (mm)	Common Clamp Lengths (mm) Repair & Tapped Clamps
	Repair clamps	Tapped clamps								
50	C3701.05915	-	×						50	50
65	C3701.06915	-							65	65
65	*C3701.07515	C3705.07515T**	×				×		65	65
80	C3701.07915	-							80	80
80	*C3701.08815	C3705.08820T**	×				×	×	80	80
80	*C3701.09515	C3705.09520T**		×	×	×		×	80	80
100	C3701.11020	C3705.11020T**	×				×		100	100
100	C3701.12020	C3705.12020T**		×	×	×		×	100	100
125	C3701.13020	C3705.13020T**	×				×		125	125
125	C3701.14020	C3705.14020T**	×						125	125
150	C3701.15020	C3705.15020T**	×						150	150
150	C3701.16020	C3705.16020T**	×				×		150	150
150	C3701.17520	C3705.17520T**		×	×	×		×	150	150
175	C3701.19020	C3705.19020T**	×						175	175
200	C3701.20020	C3705.20020T**	×						200	200
200	C3701.21020	C3705.21020T**					×		200	200
200	C3701.21520	C3705.21520T**	×						200	200
200	C3701.22520	C3705.22520T**		×	×	×		×	200	200
225	C3701.24530	C3705.24530T**	×						225	225
225	C3701.25530	C3705.25530T**		×	×	×		×	225	225
250	C3701.27030	C3705.27030T**	×				×		250	250
250	C3701.28530	C3705.28530T**		×	×	×		×	250	250
300	C3702.31040	C3705.31040T**	×				×		300	300
300	C3702.33040	C3705.33040T**		×	×	×		×	300	300
350	C3702.36040	C3705.36040T**							350	350
375	C3702.38540	C3705.38540T**	×						375	375
375	C3702.41040	C3705.41040T**		×	×	×		×	375	375
400	C3702.44040	C3705.44040T**	×		×				400	400
450	C3702.46040	C3705.46040T**						×	450	450
450	C3702.49040	C3705.49040T**		×	×	×		×	450	450
500	C3702.53040	C3705.53040T**							500	500
500	C3702.56040	C3705.56040T**		×	×	×		×	500	500
525	C3702.57040	C3705.57040T**			×			×	525	525

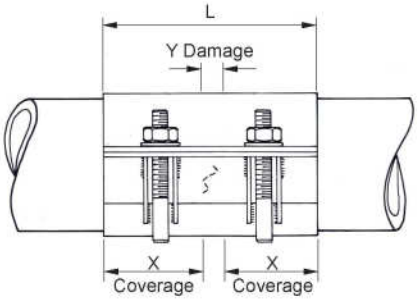
** MAX BSP = 50mm.*
*** Product code for tapped clamps requires first two digits of tapping size.*
E.g. DN100 x 200 long tapped clamp with 20mm BSP offtake = C3705.12020T20

Stainless Steel Repair Clamps

Product Specification:

- **Application** : Crevet repair clamps provide a quick and permanent solution for the repair of pressure and non-pressure pipelines. Repair clamps are designed to wrap around the affected area, eliminating the need to cut out the damaged pipe.

Repair clamps are suitable for water pipelines with operating pressures up to 1600kPa.



Pipe Nom. Dia.	Coverage X
80-100mm	50mm
150-200mm	80mm
225-300mm	100mm
375-600mm	150mm

L = Y + 2 * X
minimum recommendation
for the clamp length

Standard Stainless Steel 'Tapped Clamps'

Product Specification:

- **Application** : Tapped stainless steel clamps provide an efficient method for tapping into existing pressure water or irrigation lines. The wide band distributes even pressure and support along the entire barrel of the pipe.

  Sizes range from DN65 to DN600 with standard tapping sizes from dn20 to dn100mm BSP thread. This is only limited by the nominal diameter (DN) of the pipe to be tapped. Clamps are designed for pressures up to 1600kPa.

  Note: For larger sizes (DN375 and above) the allowable pressure ratings will need to be confirmed by Iplex Pipelines. Maximum outlet sizes for DN65 to DN80 clamps is DN50.

- **Installation** : *Guidelines for Stainless Steel Clamps can be found on page 113*

Note: 1 Other Sizes are available on request.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Stainless Steel Flanged Clamps:

DN	Product Code Flanged clamp	Pipe OD (mm)	Clamp length (mm)
80	C3707.09540F08	95-102	400
100	C3707.11040F08	110-115	400
100	C3707.11040F10	110-115	400
100	C3707.12040F08	120-125	400
100	C3707.12040F10	120-125	400
150	C3707.16040F08	160-170	400
150	C3707.16040F10	160-170	400
150	C3707.16040F15	160-170	400
150	C3707.17540F08	175-185	400
150	C3707.17540F10	175-185	400
150	C3707.17540F15	175-185	400
175	C3706.19040F08	190-200	400
175	C3706.19040F10	190-200	400
175	C3706.19040F15	190-200	400
200	C3706.20040F08	200-210	400
200	C3706.20040F10	200-210	400
200	C3706.20040F15	200-210	400
200	C3706.21040F08	210-220	400
200	C3706.21040F10	210-220	400
200	C3706.21040F15	210-220	400
200	C3706.21540F08	215-230	400
200	C3706.21540F10	215-230	400
200	C3706.21540F15	215-230	400
200	C3706.23040F08	230-245	400
200	C3706.23040F10	230-245	400
200	C3706.23040F15	230-245	400
200	C3706.23060F20	230-240	600
225	C3706.25040F08	250-265	400
225	C3706.25040F10	250-265	400
225	C3706.25040F15	250-265	400
225	C3706.25060F20	250-260	600
225	C3706.25060F22	250-260	600
250	C3706.27540F08	275-290	400
250	C3706.27540F10	275-290	400
250	C3706.27540F15	275-290	400
250	C3706.27560F20	275-285	600
250	C3706.27560F22	275-285	600
250	C3706.28540F08	285-300	400
250	C3706.28540F10	285-300	400
250	C3706.28540F15	285-300	400
250	C3706.28560F20	285-295	600
250	C3706.28560F22	285-295	600
250	C3706.28560F25	310-325	400
300	C3706.31040F08	310-325	400
300	C3706.31040F10	310-325	400
300	C3706.31040F15	310-325	600
300	C3706.31060F20	310-320	600
300	C3706.31060F22	310-320	600

Product Specification

- **Application** : Flanged clamps allow an under pressure cut in connection, without the need to shut down the line, cut out a section of the main and insert a tee.

  Flanged clamps are suitable for pressures up to 1600kPa in a range of sizes from DN80 to DN600. Flange off-take sizes are available in all common standard sizes ranging from dn80 to dn300, which are only limited by the nominal diameter (DN) of the pipe to be tapped.

  Note: Other flange configurations are available on request only.

  Flanges comply with AS/NZS 4087 'Metallic flanges for waterworks purposes' figure B7 with table D drillings to AS 2129 - 'Flanges for pipes, fittings and valves'.

- The installation procedures for Flanged off-take Clamps given in 'Installation Guidelines' page 113 - can be used provided the flanged outlet is positioned correctly. It is very important that any valve or assembly attached to the flange is supported fully and aligned to eliminate any stress on the clamp. Refer to the installation instructions attached to the clamp or contact Iplex Pipelines for further information.

Note: DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Stainless Steel Flanged Clamps: Continued...

DN	Product Code Flanged clamp	Pipe OD (mm)	Clamp length (mm)
300	C3706.31060F25	310-320	600
300	C3706.33040F08	330-350	600
300	C3706.33040F10	330-350	400
300	C3706.33040F15	330-350	400
300	C3706.33060F20	330-340	600
300	C3706.33060F22	330-340	600
300	C3706.33060F25	330-340	600
300	C3706.34060F20	340-350	600
300	C3706.34060F22	340-350	600
300	C3706.34060F25	340-350	600
300	C3706.34060F30	340-350	600
375	C3706.38540F08	385-405	400
375	C3706.38540F10	385-405	400
375	C3706.38540F15	385-405	400
375	C3706.40040F08	400-420	400
375	C3706.40040F10	400-420	400
375	C3706.40040F15	400-420	400
375	C3706.40060F20	400-410	600
375	C3706.40060F22	400-410	600
375	C3706.40060F25	400-410	600
375	C3706.40060F30	400-410	600
375	C3706.41040F08	420-430	600
375	C3706.41040F10	420-430	600
375	C3706.41040F15	420-430	600
375	C3706.41060F20	420-430	600
375	C3706.41060F22	400-420	400
375	C3706.41060F25	400-420	400
375	C3706.41060F30	400-420	400
375	C3706.42060F20	400-410	600
375	C3706.42060F22	400-410	600
375	C3706.42060F25	400-410	600
375	C3706.42060F30	400-410	600
400	C3706.44040F08	440-460	400
400	C3706.44040F10	440-460	400
400	C3706.44040F15	440-460	400
400	C3706.44060F20	440-450	600
400	C3706.44060F22	440-450	600
400	C3706.44060F25	440-450	600
400	C3706.44060F30	440-450	600
450	C3706.49040F08	490-510	400
450	C3706.49040F10	490-510	400
450	C3706.49040F15	490-510	400
450	C3706.49060F20	490-510	600
450	C3706.49060F22	490-510	600
450	C3706.49060F25	490-510	600
450	C3706.49060F30	490-510	600

Product Specification

- **Application** : Flanged clamps allow an under pressure cut in connection, without the need to shut down the line, cut out a section of the main and insert a tee.

  Flanged clamps are suitable for pressures up to 1600kPa in a range of sizes from DN80 to DN600. Flange off-take sizes are available in all common standard sizes ranging from dn80 to dn300, which are only limited by the nominal diameter (DN) of the pipe to be tapped.

  Note: Other flange configurations are available on request only.

  Flanges comply with AS/NZS 4087 'Metallic flanges for waterworks purposes' figure B7 with table D drillings to AS 2129 - 'Flanges for pipes, fittings and valves'.

- The installation procedures for Flanged off-take Clamps given in 'Installation Guidelines' page 113 - can be used provided the flanged outlet is positioned correctly. It is very important that any valve or assembly attached to the flange is supported fully and aligned to eliminate any stress on the clamp. Refer to the installation instructions attached to the clamp or contact Iplex Pipelines for further information.

Note: 1 Larger sizes available on request.
2 DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

4.0 Transportation and storage

DN450 Irontite® pipes transported to site via road

Although ductile iron pipes and fittings are known for their mechanical strength and robustness of their coatings, it is important to avoid swinging pipes or rubbing pipes against each other. Pipes and fittings should avoid impact and not be dropped or come into contact with sharp objects likely to cause damage.

All ductile iron pipes are normally packed for road freight on timber bearers to prevent any direct contact with the bottom of the tray. Pipes are secured to the truck with chains to prevent movement during transit. Rubber padding is also used between the chains and outer pipes in the top row for protection against damage.

Packaging and crating details for Irontite® pipes

DN	Quantity per pack (Lengths)	Quantity per deck (Lengths)	Quantity semi load (Lengths)	Approximate pipe mass (kg/Length)
100	21	15	190	111
150	10	11	128	175
200	12	9	100	229
225	6	8	83	241
250	9	7	71	304
300	6	6	53	400
375	4	5	38	590
450	4	4	28	780
500	2	4	24	828
600	2	3	18	1089
750	2	2	12	1620

Generally DN100 and DN150 are supplied in packs.
All other sizes can be transported in either packs or deck quantities depending on project requirements at time of ordering.

Upon arrival, check pipes and fittings for damage and check quantities ordered of each item against the delivery docket. Make note of any damage or loss on the delivery docket and have the driver sign it. Damaged pipes and fittings should be quarantined and inspected to determine appropriate action.

Pipes should be lifted carefully off the truck in a safe and controlled manner. Lifting and stacking must be performed in such a way that the stability of the stack, crane or vehicle is not affected.

Irontite® ductile iron pipes are normally unloaded by crane. However a suitable forklift can also be used provided the unloading area is even, level and stable for lifting. Forklifts with attachments must be load rated to suit the lifting requirements. Contact the forklift manufacturer for advice and information for your particular needs. Always follow safe unloading requirements at all times.

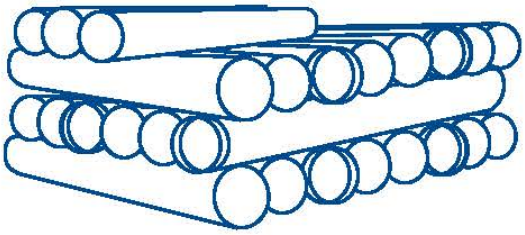
Irontite® pipes are safely unloaded with approved lifting equipment at Cloncurry, Queensland

The storage site must be even, level and stable for lifting and stacking. Stack the pipes on horizontal supporting timbers placed on the ground approximately 1500mm from each pipe end. The same timbers should also be used to separate layers if pipes are stacked. Stack heights should be limited from a safety point of view and to prevent damage to pipes in the bottom layers. The socket and spigot ends should be placed at opposite ends with the socket protruding to prevent point loading during storage.

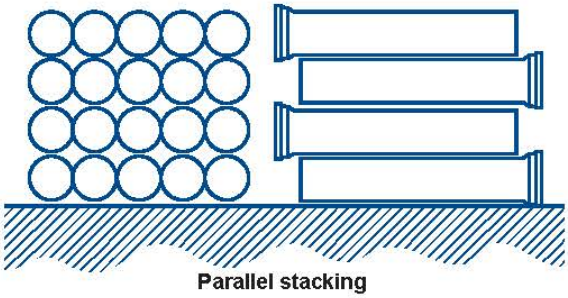
Typical stack heights

DN	Typical stack height (Layers of pipe)
100	12
150	8
200	7
225	6
250	5
300	4
375	3
450	3
500	3
600	3
750	3

Stack heights are highly dependant on site conditions and method of stacking. A risk analysis should be undertaken by a competent person, to ensure all safety precautions have been examined on site, prior to stacking pipes.



Square stackings



Parallel stacking

4.1 Storage - rubber rings, sleeving and lubricant

Rubber ring seals and sleeving should be stored away from direct sunlight. They should also be protected from greases and oils and solvents and other harmful substances.

Only lubricant supplied with Irontite® pipe and ductile iron fittings from Iplex should be used as other types, e.g mineral based oils and greases can destroy the rubber ring.

4.2 Pipe handling

Ductile iron pipes are susceptible to damage by impact loading. Poor handling can result in damaged linings and in severe cases deformation of the spigot, which could affect the sealing of the joint.

Following the correct unloading and handling procedures can avoid impact damage. Prior to laying the pipe inspect pipes for damage to the pipe itself, including pipe spigot and socket and cement mortar linings.

Pipes should be lifted with proper slings and foundry hooks. End hooks should be rubber padded to protect the cement lining from damage. Lift pipes carefully and avoid impact.

4.3 Pipe repair

If pipes are damaged, they can be repaired on site or in the storage yard. The following is a guide only when assessing any damage.

1. Where external surfaces are slightly damaged, (small areas, zinc not detached) repairs are not necessary.

2. Where a large area of the coating has been damaged, contact Iplex pipelines for instructions.

3. Any cement mortar lining damage with an area less than 0.10m^2 and less than 25% of the pipe circumference with no localised damage can be repaired. Contact Iplex pipelines for instructions.

Alternatively cutting off the damaged section may be more appropriate.

5.0 Installation of Irontite® ductile iron pipes

Installation methods for ductile iron pipes are generally in accordance with AS/NZS 2566 Buried flexible pipelines Part 2: 'Installation'. The standard specifies the requirements for the installation, field testing and commissioning of buried flexible pipelines with structural design in accordance with AS/NZS 2566.1.

Irontite® ductile iron pipes are classed as semi rigid. They provide a good compromise between resistance to soil and superimposed loading and vertical deflection providing long-term operational security. The Australian Standard AS/NZS 2566 details a code of practice, which may be applied to the calculation of loads on ductile iron pipes under various installation conditions.

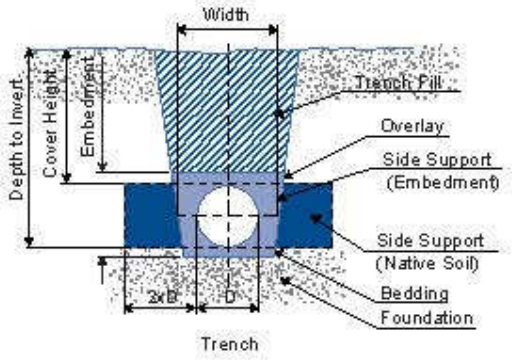
Installation in buried applications

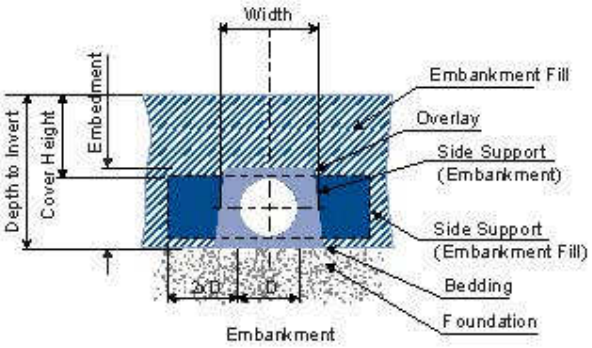
The trench width should be sufficient to permit the pipe and the joint to be properly bedded and to facilitate adequate compaction of the initial embedment material, particularly in the haunch zone. Where a slight curve in the pipeline is required, the base of the excavation should generally be widened to enable the pipes to be joined in a straight line before the deflection is made.

After excavation, the trench walls should remain firm and show no signs of collapse. The minimum width of the trench shall be sufficient to allow the placement and compaction of the embedment material and making and inspecting the joints. Localised widening and deepening may be necessary to allow for the installation of valves, fittings and associated thrust or anchor blocks.

DN450 Irontite® pipe in typical trench with blue sleeving for water supply pipeline

Buried pipeline terminology





Minimum recommend trench dimensions based on accepted practice as a guide only[1] (Nominal overlay and bedding thickness 100mm)

DN	Nominal trench width (mm)
100	400
150	450
200	500
225	550
250	550
300	600
375	700
450	800
500	850
600	950
750	1100

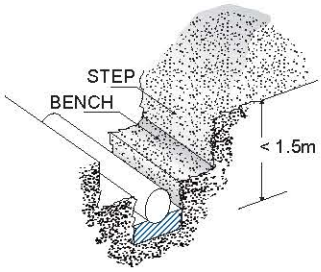
[1]*Note: Side clearance may vary for compaction requirements and safety in deep trenching. Overlaying may also increase where live loads are applied to shallow cover. Therefore always refer to construction drawings and specifications or local authority requirements.*

Unstable conditions

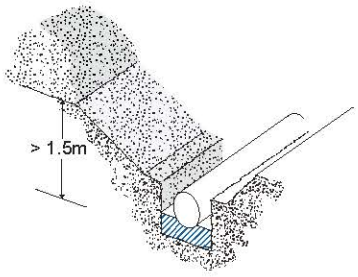
If after excavation, the trench walls tend to collapse and cave in, it will be necessary to widen the trench until stability is reached. A smaller trench could be excavated as shown on page 76. A competent person must access the risk and check regulations.

Trench excavation in unstable conditions

Step Battered Trench



Battered Trench



Trench Depths

The minimum trench depth should be sufficient such that the anticipated loading will not damage the pipeline. As a guide the minimum covers given below are in accordance with AS/NZS 2566. However refer to the construction drawings and specifications, as the minimum depth could also be dependant on a number of other conditions such as location, alignment, open field or road, valve locations, pigging pits, hydrant assemblies, topography and surface soil conditions.

Loading condition	Minimum cover H* (mm)
Not subject to vehicle loading	300
Land zoned for agricultural use	600
Subject to vehicular loading –	
a) No carriageway	450
b) Sealed carriageways	600
c) Unsealed carriageways	750
Pipelines in embankments or subject to construction equipment loads	750

Foundation

The native soil in the foundation zone should be excavated to grade to permit the pipeline to be correctly aligned, allowing for bedding material of a minimum thickness of 100mm beneath the pipe, depending on the diameter. The trench bottom should be even and free of large clods and stones.

Any over excavation must be filled in with the same embedment material to be used in the embedment zone.

Embedment and backfill

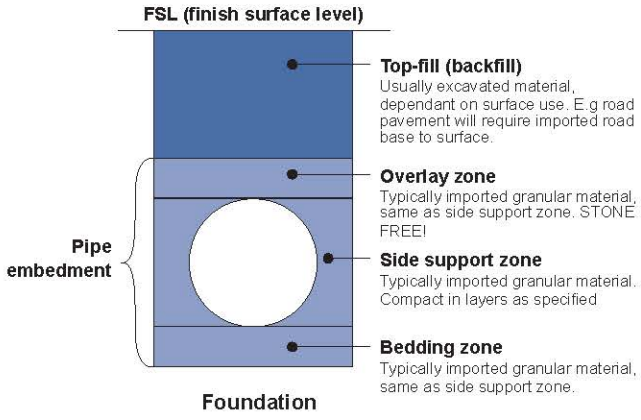
The pipe bedding should comprise of embedment material providing uniform support and load distribution along the pipe barrel as well as supporting the embedment material around the pipe.

A layer of granular material with a maximum particle size of 20mm placed and compacted to least 100mm clear thickness is recommended. Note that the choice of bedding should also be carefully selected so that it does not damage any corrosion protection system on the pipe. A slight depression should be formed under each socket to ensure that the complete length of the pipe barrel is evenly supported. When aligned as specified the pipes should be on the centreline of the trench. If groundwater is present, the trench should be de-watered so that the pipes can be installed in a relatively dry trench. In unstable soils additional bedding may be required to provide a sound foundation where unsatisfactory native material has been removed from the foundation zone.

Once the trench and bedding has been prepared, pipes can be lowered into the trench with suitable lifting equipment. Generally an excavator/backhoe can be used with a suitable nylon sling at the pipe's centre of balance.

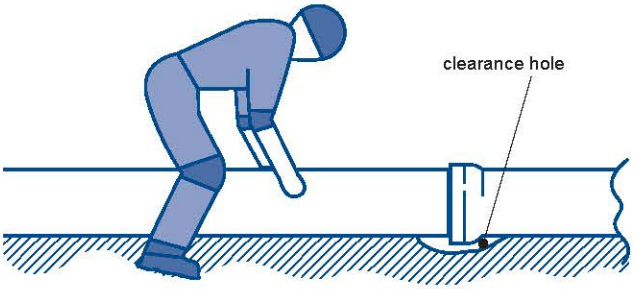
The quality of the embedment material, its compaction and the nature of the undisturbed native soil, are all relevant to the ultimate performance of Irontite® ductile iron pipes once installed. The trench bottom should be as smooth as possible and to grade.

Embedment zones



Embedment material in the embedment zone (bedding, side support and overlay) should as a general rule be non-cohesive granular material such as sand with no sharp objects or stones. Pipes should not be buried in contact with soil particle sizes larger than 5% of diameter, with 20mm as maximum. Soil clods must be excluded from the pipe embedment zone and under no circumstances should temporary supports such as bricks or timber be left under or in contact with pipes. If the excavated material is not granular or friable, or does not comply with the project specification, then suitable embedment must be imported.

Even bedding + bell holes for each socket



Small "clearance holes" should be excavated in the bedding for pipe sockets to ensure the pipes are evenly supported along the full length. It is important that only non-cohesive or granular embedment be used. Careful attention to the placement of embedment material to the specified relative compaction with an absence of voids is important.

Ensure the type and or shape of backfill and the method of compaction does not damage the polyethylene sleeving or corrosion protection coating.

Final backfilling in the trench fill zone to ground level can be completed using the spoil originally excavated from the trench. Care should be exercised to exclude large rocks or stones from the final backfill. The trench fill should be compacted in layers to reduce the possibility of settlement over time.

Cutting

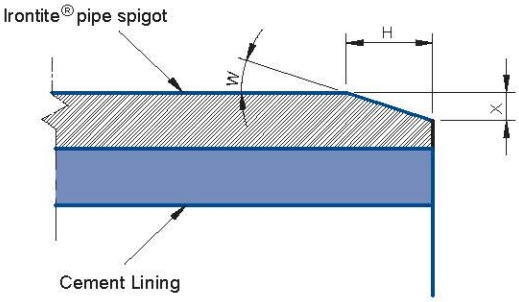
Irontite® ductile iron pipes can be cut on site, for short length adjustments or connection to fittings with a powered cutting disc. Pipes should have a square cut. The surface of the pipe and cement lining must not be damaged, to ensure joint integrity. Ensure all safety precautions are adhered to. Wear safety glasses, gloves, ear protection, safety helmet and boots at all times.

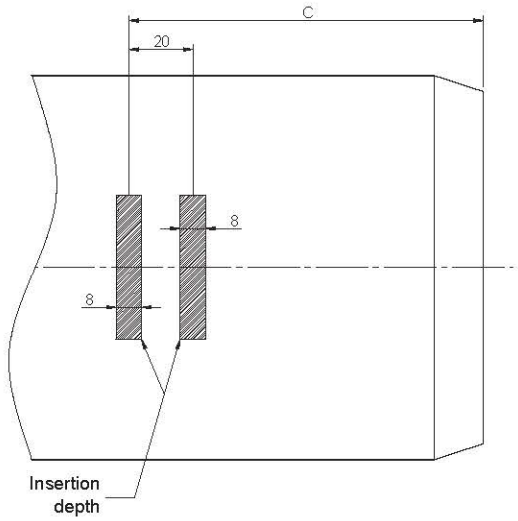
Prior to cutting, place the pipe on timber supports and chock to prevent rolling during the cutting process. Put a tape around the pipe and mark the pipe as a guide for cutting. Pipes should be rolled so it can be cut from the 'top' around the pipe circumference.

Once the cut is completed, ensure the cut end is then chamfered to the correct length and angle. The chamfer and new witness mark should replicate the manufactured dimensions (see Table 18). Ensure all sharp edges are removed to prevent damage to the pipes rubber ring seal.

The chamfered surface should be painted to reinstate the pore-sealing properties of the protective metallic zinc coating.

Note: The outside diameters of Irontite pipes are fully toleranced along the pipe length up to 4m from the spigot end. Pipes taper slightly 2m from the socket end. If pipes are cut beyond the limit of tolerance, grinding of the peening pattern on the pipes outside surface may be required to facilitate jointing.





Nominal Size	H (mm)	W°	X (mm)	C (mm)
DN100	9+2.0	15	2.4	89
DN150	9+2.0	15	2.4	89
DN200	9+2.0	15	2.4	102
DN225	9+2.0	15	2.4	102
DN250	9+2.0	15	2.4	102
DN300	9+2.0	15	2.4	102
DN375	9+2.0	18	2.9	127
DN450	9+2.0	18	2.9	127
DN500	9+2.0	18	2.9	127
DN600	9+2.0	18	2.9	127
DN750	15+2.0	18	4.8	154

Pipe jointing

Irontite® ductile iron pipes are supplied with a standard rubber ring spigot and socket joint, which can be easily assembled by pushing the pipe spigot into the socket. It is normal practice to string the pipes so that they can be laid by starting from the down stream end with the socket end facing in the upstream direction.

Installation Guidelines

1. Remove all dust, dirt or soil from the pipe spigot and socket. Ensure the ring seat in the socket is completely clean.

2. Ensure the ring is also completely clean. If the ring is damaged in any way it should be rejected and replaced with another ring

3. Introduce the ring into the socket by looping it into a 'heart' shape. The ring should be correctly seated in the socket.

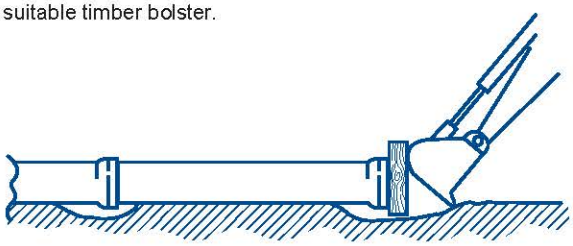
4. Apply even radial pressure around the circumference to ensure the ring sits correctly in place.

5. Lubricate the spigot with an approved pipe lubricant up to the witness mark. Ensure the pipe lubricant is also applied to the pipe chamfer and exposed surface of the assembled ring in the socket.

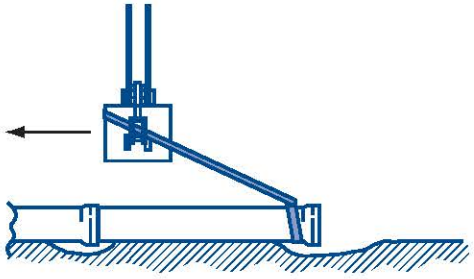
   Note: Do not apply any lubricant in the socket grooves or underneath the ring and ensure the lubricated spigot does not pick up dirt, soil or contamination when introducing the spigot into the socket.

6. Insert the leading edge of the pipe spigot into the socket mouth. It is essential that the pipes be aligned in a straight line before attempting to make the joint. Ensure the poly sleeving is clear of the socket face, if fitted.

7. Jointing equipment should apply load steadily and evenly around the socket. Ensure the jointing force is applied to a suitable timber bolster.



8. Apply even jointing force and push home until the witness mark is just visible.

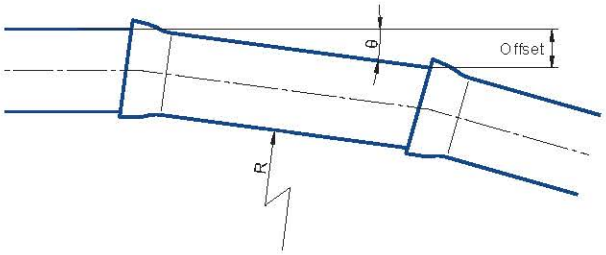


Angular deflection

Where the pipe alignment needs to be curved within a tighter radius then pipes can be cut in shorter lengths to provide the required offset. Ductile iron collars may be used allowing up to 5° per joint depending on the diameter. The maximum angular deflection achievable at each pipe and fitting socket may vary depending on end straightness, chamfer size, spigot and socket dimensions, socket depth and type, ovality and position of pipe spigot along the barrel when cut. For further information, contact Iplex Pipelines. Values given in the table below are approximate only and should only be used as a guide. Further reference can be obtained from AS/NZS 2280.

Note : Always join pipes in a straight line and then deflect the pipe to the required angle.

Irontite® rubber ring joint



Maximum allowable pipe joint deflection[1]

DN	Allowable deflection (degree)	Offset per 6m length (mm)	Minimum Radius of curvature (m)
100 - 200	up to 5°	up to 522	> 69m
225 - 375	up to 4°	up to 418	> 86m
450 - 750	up to 2°	up to 209	> 172m

[1] *Pipe joint deflection may be subject to local authority requirements. This should be checked prior to installing and deflecting the pipe.*

Thrust block design

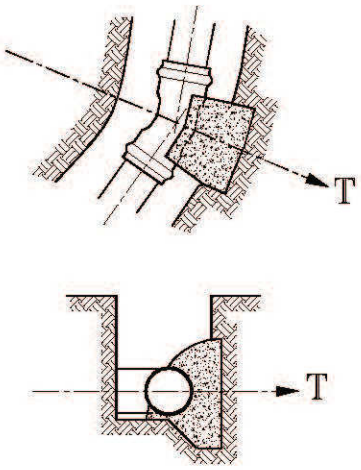
For any rubber ring jointed pipeline system, provision must be made for potentially unrestrained forces at changes of size or direction in the pipeline. For example, bends, tees, reducers, valves and closed ends. In buried installations, fittings are usually restrained by concrete anchor blocks, which are cast in situ.

These thrust blocks are formed and sized to distribute the applied force from the fitting to a safe soil pressure at the soil/concrete interface. The resistance, which can be provided, will depend on the soil type and depth. Where bends are in the vertical plane with a convex profile downwards, the weight of the concrete anchor block alone may be the restraining force.

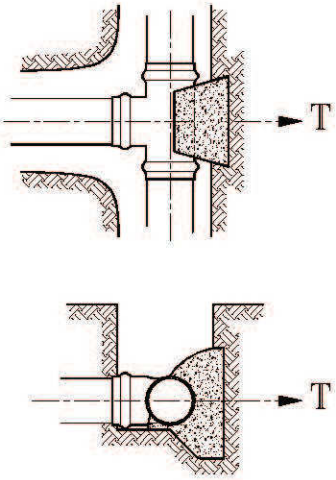
Check drawings and specifications for size, type and reinforcement requirements.

Typical thrust block configurations. As per AS/NZS 2566.1 and AS/NZS 2566.

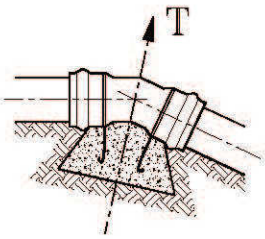
Bend in horizontal plane



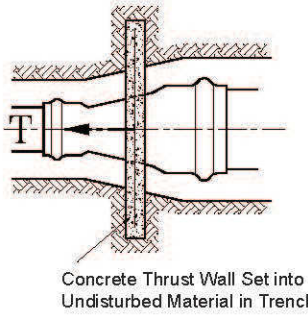
Tee anchorage

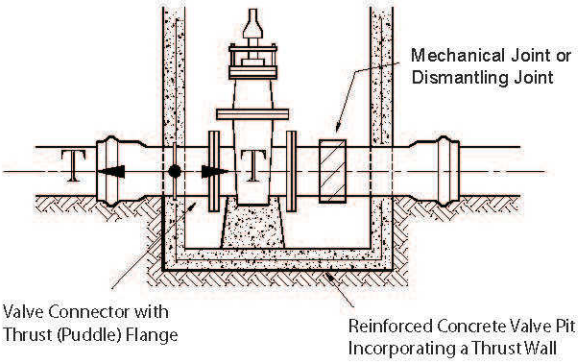


Bend in vert



Reducer anchorage





Hydrostatic forces in kilonewtons on rubber ring jointed fittings per ten (10) metres of hydrostatic head

Nominal diameter DN	Pipe OD (mm)	Bend 90°	Bend 45°	Bend 22.5°	Bend 11.25°	Tee, Closed end and valve
100	122	1.62	0.88	0.45	0.22	1.15
150	177	3.41	1.85	0.94	0.47	2.41
200	232	5.86	3.18	1.61	0.81	4.14
225	259	7.31	3.96	2.01	1.01	5.17
250	286	8.91	4.83	2.45	1.23	6.30
300	345	12.96	7.02	3.57	1.79	9.16
375	426	19.76	10.71	5.44	2.72	13.97
450	507	28.01	15.16	7.73	3.88	19.79
500	560	34.17	18.49	9.43	4.74	24.15
600	667	48.48	26.24	13.37	6.72	34.26
750	826	74.35	40.24	20.51	10.31	52.54

Note: For concentric reducers the resultant thrust will be the difference between the "closed end" forces for the two pipe sizes.

Soil bearing capacitates in kPa – apply minimum factor of safety of 1.1

Soil group description as per AS 1726	Minimum soil cover above center line of thrust block in metres			
	0.75	1.0	1.25	1.5
GW, SW	57	76	95	114
GP, SP	48	64	80	97
GM, SM	48	64	80	96
GC, SC	79	92	105	119
CL	74	85	95	106
ML	69	81	93	106
OH	0	0	0	0

Thrust blocks must be configured to distribute the hydrostatic force to a "wall" of undisturbed soil, which is approximately perpendicular to the imposed load. The equation for this calculation is:

$$A = \left[\frac{T}{b}\right] \times f \qquad \text{..... Equation 5}$$

Where

A = the area perpendicular to the force (m^2)

T = hydrostatic thrust (kN)

b = soil bearing capacity (kPa)

f = factor of safety

Example:

Problem:
A DN300 Irontite® Ductile Iron pipeline has a maximum operating head (include field test heads) of 150 metres.

What is the minimum area required for a thrust block, for a 90° ductile iron bend buried with 1 metre of cover, to the centre line of the bend in a type SC soil?

Solution:
From Table 20, the hydrostatic thrust "T" is 12.96 x 15 = 194.4 kN.

From Table 21, "b" = 92 kPa.

Therefore:

"A" = (194.4 / 92) x 1.1

"A" = 2.32 m^2 of area perpendicular to the force

Anchorage of valves

Under pressure conditions, valves require anchorage to resist the thrust developed when the valve is closed. Australian Standard AS/NZS 2566.2 requires the use of thrust blocks for all in-line gate valves. Although no longer allowed, Water agencies have in the past omitted valve restraints in small diameter reticulation pipelines e.g.≤ DN200.

Where there is risk of axial thrust it is strongly recommended that only those ductile iron fittings with full circle bearing surfaces at the base of the socket should be used. This serves to increase the effective end bearing area for the ductile iron spigot inside the ductile iron socket. Installers should be alerted to the potential for catastrophic failure where there is insufficient buried pipe downstream of an unanchored valve to provide enough soil friction to resist the hydrostatic thrust when the valve is closed.

Anchorage on parallel steep slopes

Laying ductile iron pipes on steep slopes may require anchorage to resist slippage or movement.

The angle at which slopes become unstable depends on the soil conditions and the friction between the pipeline and the ground, being insufficient to hold the pipe. The risk of unstable conditions increases with the angle of the slope and as a result, the longitudinal gravitational movement has to be counteracted by anchoring the pipeline. Using bulkheads or concrete anchor blocks can achieve this.

In general, ductile iron pipes need to be anchored when the incline exceeds 20% for above ground pipelines and 25% for buried pipelines or in areas where slope instability is suspected. In this situation supporting conditions should be verified by a proper geo-technical investigation.

The preferred method of installing pipes on steep slopes is above ground as above ground structures such as pipe supports are more easily defined and the quality of the installation is easier to monitor and settlement easier to detect.

Above ground installations requires anchoring of every pipe. An anchor block behind every pipe socket is common practice with sockets pointing uphill to take purchase on the blocks. A clearance of 10mm is left between the spigot and the back of the socket to accommodate expansion.

Buried pipelines installed on slopes greater than 25% require consultation from a suitably qualified geotechnical engineer. Ductile iron pipes may be installed on slopes greater than 25% provided the following conditions are achieved as a minimum:

- Long term stability of the installation is permanent and a proper geo-technical design is undertaken.
- A high quality embedment material is used in the embedment zone and installed in accordance with the requirements in AS/NZS 2566.2 'Buried flexible pipelines Part 2: Installation" Common practice is the use of cement stabilised embedment around the pipe in the embedment zone.
- For slopes greater than 25%, the use of bulkheads can prevent scouring of the embedment, trench drainage and consequent trench collapse. The bulkheads should be placed at the discretion of the construction engineer and suitable drainage should pass through the bulkhead to facilitate natural drainage along the trench.
- Installation should always proceed from the low point and progress up the slope. Each length should be properly embedded and backfilled to grade before the next pipe is installed. The surface over the completed pipe trench must be protected against erosion.
- Pipes installed in the trench, must be kept straight.
- Absolute long-term movement of the embedment and top-fill n the axial direction of the pipe must be less than 20mm
- Stability of individual pipes should be monitored throughout the installation. This can be achieved by checking the gap between the pipe spigot and socket.

5.1 Installation of Polyethylene sleeving

Polyethylene sleeving is a tubular film of polyethylene slipped over and fitted onto the outside of ductile iron pipe at the time of installation. The sleeving is used to supplement the basic pipe coating (metallic zinc and 2-part epoxy paint) in some more aggressive environments

The polyethylene sleeving should be installed in accordance with the requirements specified in AS 3681 'Guidelines for the application of polyethylene sleeving to ductile iron pipelines and fittings'. The sleeving will ensure a high degree of protection in aggressive conditions and provide greater service life.

Important points when sleeving Irontite® pipe

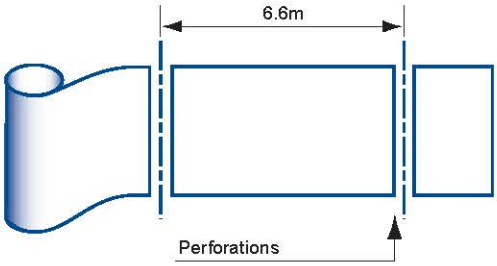
- Sleeving is not U.V resistant.
- Sleeved pipe must rest on sand or sawdust bags or suitable timbers to avoid damage prior to installation.
- Lift the pipe using a method that will not damage the sleeving.
- Keep the sleeving clear of water and dirt.
- The sleeving must fully encapsulate the pipe.
- The sleeving must fit tightly around the pipe.
- The sleeving must be sealed from water and soil.

Installation Guidelines

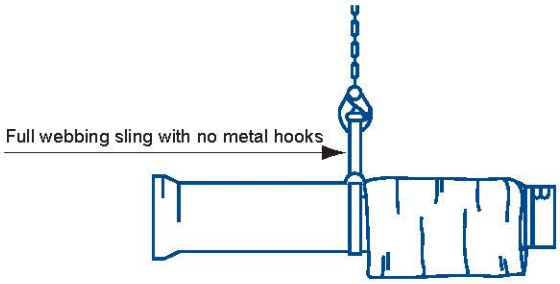
1. *Prepare the site*
   a) Lifting equipment,
   b) Sand/sawdust bags,
   c) Sleeving,
   d) Tape and straps and buckles.

2. *Clean the pipe*

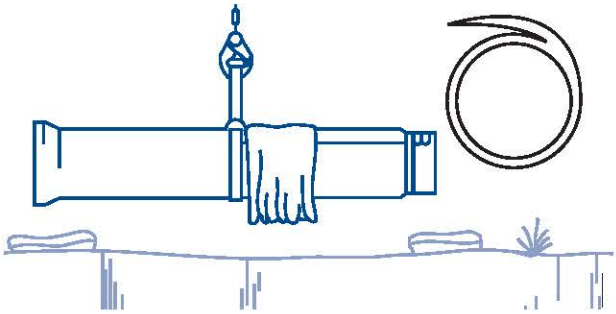
3. *Sleeving is perforated in 6.6m lengths for easy tear off*
   Remove single sleeve from the roll.



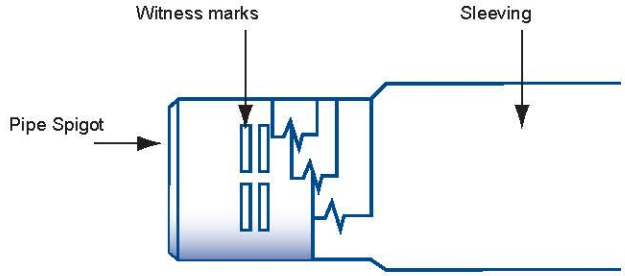
4. *Pull the sleeving onto the pipe*
   a) Centralise the sling until the pipe is balanced
   b) Pull the sleeving towards the sling



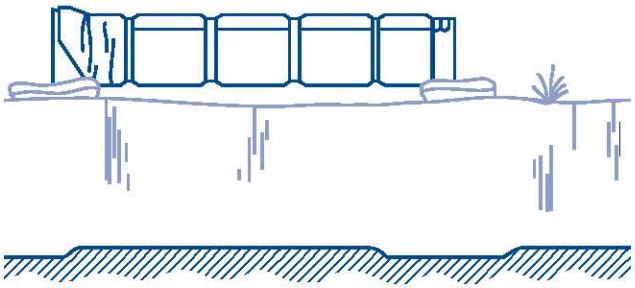
5. *Fit the sleeving onto the pipe*
   a) Fold the sleeving at the top of the pipe, pulling tightly
   b) Ensure the sleeving is close to the witness marks, but not covering them!



6. *Apply the tape to the sleeving at the spigot end, with 3 overlapping turns of the tape*
   a) Ensure the witness marks are not covered.



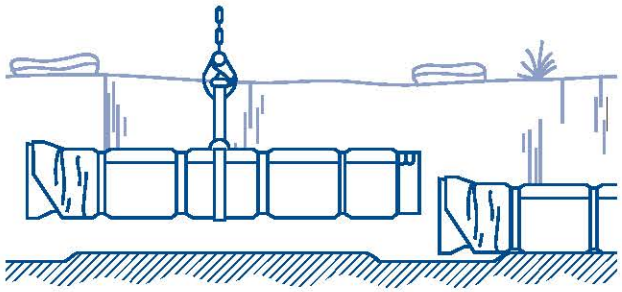
7. *Continue to secure the sleeving*
   a) Lower the pipes onto the sand/sawdust bags
   b) Remove the sling
   c) Pull the sleeving along the pipe
   d) Tape the sleeving at regular 1 metre intervals
   e) Ensure a suitable depression has been made in the bedding where the joint will be located. This will facilitate the final overlap and sealing of the sleeve



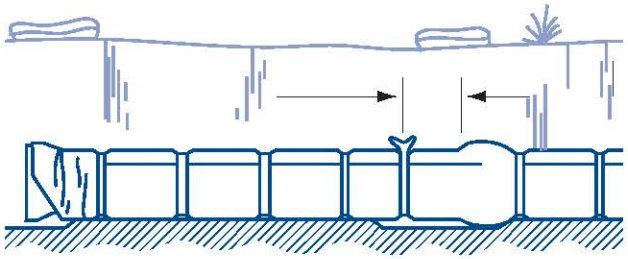
Note: The tape must be wound right around the pipe.

8. *Lift the pipe from the centre with a sling*

9. *Keep the fold of the sleeving at the top of the pipe*
   (The fold line should be at the side facing down)



10. *Overlap the sleeving over the joint and secure with the strap and buckle*
    Avoid scooping embedment into the sleeving when drawing across the bedding depression.



Sleeving fittings

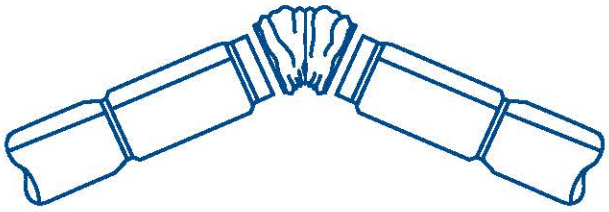
Important points with sleeving fittings

- If fittings are not polymeric coated, then they must be sleeved
- All fittings must be fully encapsulated (covered)
- The sleeving must fit tightly
- The sleeving must be sealed from water and soil

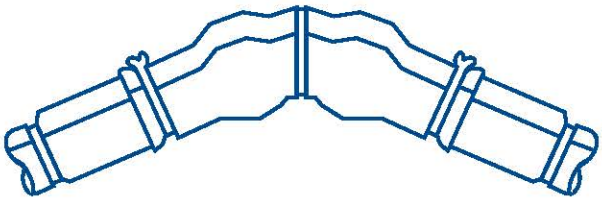
Installation Guidelines

Bends

1. Cut the sleeving long enough to allow an overlap of about 300mm to 500mm
2. Apply sleeving to the bend and secure with tape around the centre of the bend
3. Bunch the ends



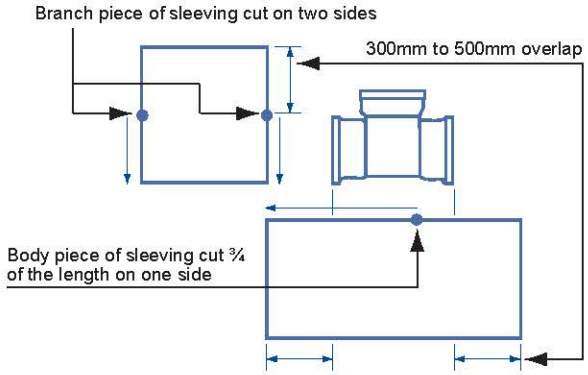
4. After joining the bend to the pipes, pull the bunched ends over the pipes and seal with straps and buckles



Tees

Two pieces of sleeving are required

1. Allow 300mm to 500mm overlap
2. Cut the body piece ¾ of the way along one side of the sleeve
3. Cut the branch piece on two sides of the sleeve
4. Lift the tee using a sling from the top of the branch
5. Slide the body piece on the tee. Tape the sleeve and seal
6. Lower onto sand /saw dust bag
7. Remove the sling once the tee is secure on the sand /saw dust bag
8. Slide the branch piece of sleeving onto the tee. Tape the sleeve and seal



Couplings and Flanges

Protect the sleeving from sharp edges. Double sleeve if required. Tape wrapping may be required. Check specification.

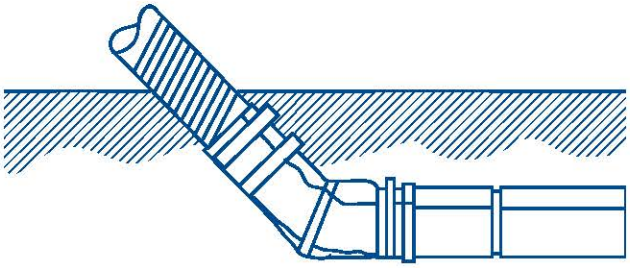
Transitions

From below ground to above ground.

Do not use sleeving at the transition. It is not UV resistant and a line of corrosion will occur at the interface.

Use a suitable tape wrap system for the transition from below ground to above ground. (Check the specification or local authority for requirements)

Seal the sleeving below ground over the tape wrap.



Tapping saddles (Bitumen coated)

1. Remove a 150mm section of sleeving at the tapping position
2. Assemble the tapping saddle onto the pipe
3. Using a separate piece of sleeving, wrap it circumferentially around the exposed pipe section and tapping saddle. Tape the ends of the sleeving
4. Install the ferrule and bend to the tapping saddle as required

Minor repairs

If the sleeving is damaged during pipe handling or installation, wrapping a sheet of sleeving of sufficient size can repair it. Ensure the new sleeving provides a good overlap around the pipe. Apply the tape circumferentially to form a seal at both ends of the repair and to the longitudinal seam at the overlap.

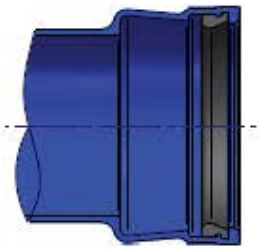
5.2 Installation of Crevet® ductile fittings

The same jointing procedure used for joining Irontite® pipes can be used for the fittings. Fittings such as bends may have a jointing lug to allow the anchoring of jointing equipment.

Installation Guidelines

Ductile Iron or PVC Spigot to Ductile Iron Socket

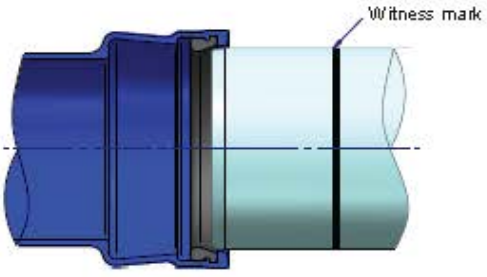
1. ***Socket and Seal*:** Generally, socket joints are supplied with the rubber ring/seal fitted (as shown below). Apply approved lubricant to the seal.



Note: If the rubber ring/seal is not fitted, do not lubricate the ring/seal or the ring groove of the socket as this may cause the rubber ring/seal to roll or dislodge during installation.

2. ***Spigot*:** Where a pipe needs to be cut in the field ensure the spigot has been cut square and with a chamfer as per the manufacturer's recommendations. Remove any burrs and place a witness mark by measuring the depth of the socket. For cut sections of pipe the squareness and chamfer of the cut pipe will ensure ease of jointing.

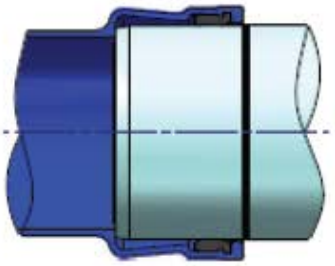
***Alignment*:** The key to jointing is aligning the spigot to the socket in a straight line. This will ensure the applied force during the jointing process is not being lost in misalignment



Note: Ensure the sealing surface of the spigot is clean from dirt or any loose material.

2. ***Restraint*:** It is important to restrain the fitting during the jointing process. Bends, tees, or other fittings need to be restrained by manual or mechanical means. Bends are more difficult than tees and have bosses and lugs cast in to restrain and aid in the jointing process.

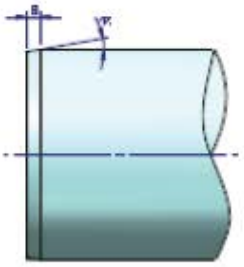
Note: Care should be taken to avoid damaging the pipe/fittings when restrained.



4. ***Jointing*:** Ensure approved lubricant is applied evenly to the spigot up to the witness mark, including the pipe chamber, once jointed, the spigot may be moved easily within the socket, but as the lubricant dries this will be more difficult. Use a crowbar to apply force onto a wooden block bearing against the pipe end.

Note: Jointing force must be applied consistently. Once the spigot end has passed the seal and moved approximately 20-40mm inside, the force applied will decrease significantly.

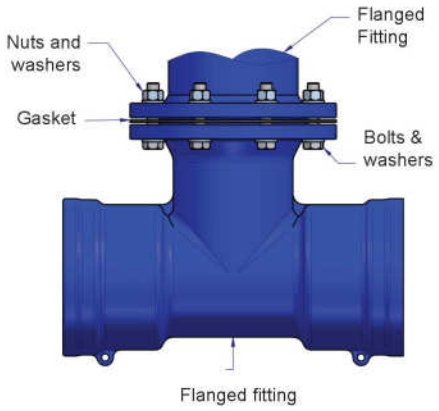
5. ***Deflection*:** Insert the spigot as per above mentioned steps after which the pipe needs to be pulled back sufficiently to achieve the deflection required.



DN	Typical Chamfer Guide (mm)					
	PVC-O		PVC-M		Ductile Iron	
	A°	B	A°	B	A°	B
80	N/A	N/A	N/A	N/A	20	10
100	15	6	15	15	20	10
150	15	9	15	18	20	10
200	15	12	15	21	20	10
225	15	13	15	22	20	10
250	15	14	15	23	20	10
300	15	17	15	26	20	10
375	N/A	N/A	15	30	20	16
450	N/A	N/A	15	32	20	16
500	N/A	N/A	15	42	20	16
600	N/A	N/A	N/A	N/A	20	16
750	N/A	N/A	N/A	N/A	20	20

Installation Guidelines

Flanged Joints



1. Place the gasket over the flange. Ensure that the holes on the gasket align evenly with the flanged holes.

2. Place the flange over the gasket. Ensure that the flanges align evenly. Insert washers and bolts form one side and washers and nuts from the other side.

3. Tighten as per standard flange bolt tightening practice.

Estimated tightening torque values

Standard pressure flanges as AS/NZS 4087 Figure B5 PN16 Grade 4.6 galvanised steel bolts and nuts or Grade 316 Class 50 stainless steel bolts and nuts with full face gasket - 3mm rubber gasket

Nominal size (DN)	Bolt size	No. of Bolts	Suggested length of Bolts (mm)	Bolt Tension (kN)	Estimated Torques (Nm)		
					Lightly Oiled	Well Lubricated	
					'GSB'	'GSB'	'SSB'
80	M16	4	65	16	60	40	55
100	M16	4	75	22	80	55	70
150	M16	8	75	17	60	40	55
200	M16	8	75	22	80	55	70
225	M16	8	75	24	85	60	80
250	M20	8	90	35	155	105	140
300	M20	12	100	28	125	85	115
375	M24	12	100	42	220	150	200
450	M24	12	120	53	280	190	255
500	M24	16	120	52	275	185	250
600	M27	16	130	67	400	270	360
750	M30	20	140	80	530	360	480

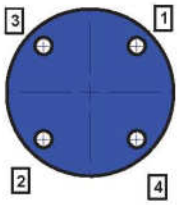
High pressure flanges AS/NZS 4087 Figure B6 PN35 Grade 8.8 galvanised steel studs and nuts or Grade 316 Class 70 stainless steel studs and nuts with full face gasket - 1.5mm fibre gasket

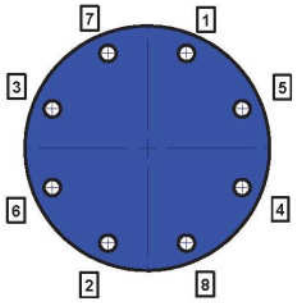
Nominal size (DN)	Bolt size	No. of Bolts	Suggested length of Bolts (mm)	Bolt Tension (kN)	Estimated Torques (Nm)		
					Lightly Oiled	Well Lubricated	
					'GSB'	'GSB'	'SSB'
80	M16	8	110	41	140	100	135
100	M16	8	110	52	180	130	170
150	M20	12	130	66	290	200	265
200	M20	12	130	93	410	280	375
225	M24	12	150	108	570	390	520
250	M24	12	150	118	620	430	570
300	M24	16	150	110	580	400	530
375	M27	16	170	141	840	570	760
450	M30	20	190	150	990	680	900
500	M30	24	190	156	1030	700	935
600	M33	24	210	195	1420	970	1290
750	M33	28	210	230	1670	1140	1520

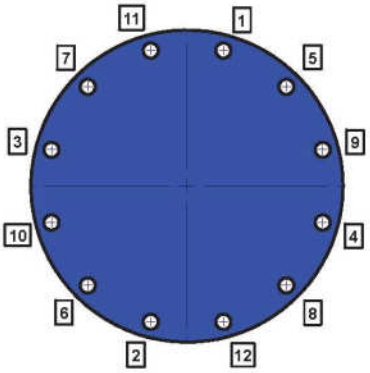
Note:

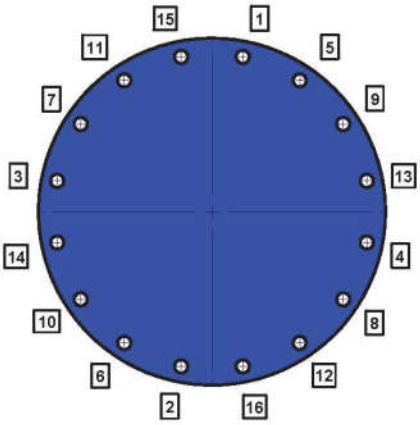
- *"Lightly Oiled" refers to the application of a good quality lubricating oil and is the usual as received condition of fasteners.*
- *"Well Lubricated" refers to the application of molybdenum disulphide grease or equivalent antiseize compound.*
- *Tightening shall be in three steps 30%, 60% & 100% of tightening torque.*
- *These guidelines are also applicable for dismantling joint and adapta flange fittings during flange to flange jointing.*

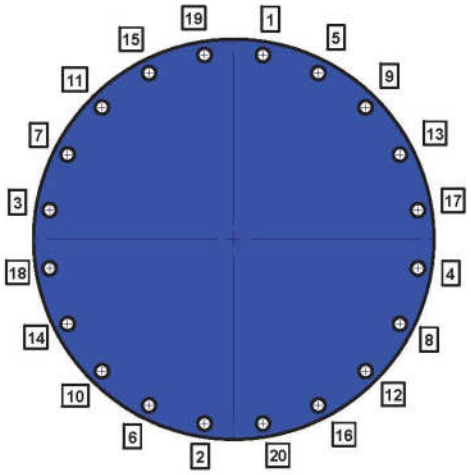
Flange to Flange (Typical Flange Bolt Tightening Sequence)

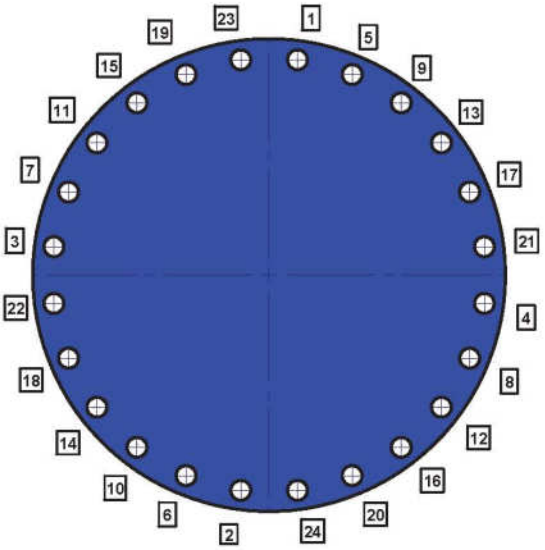


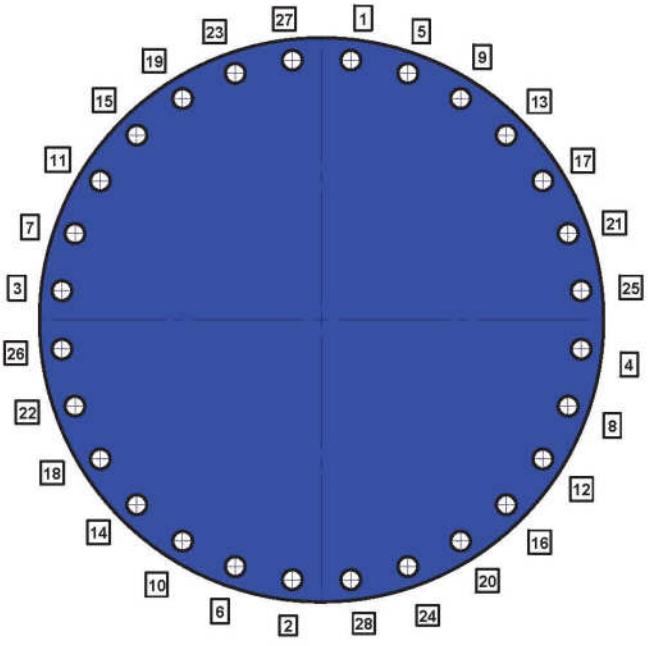












Tapped connections

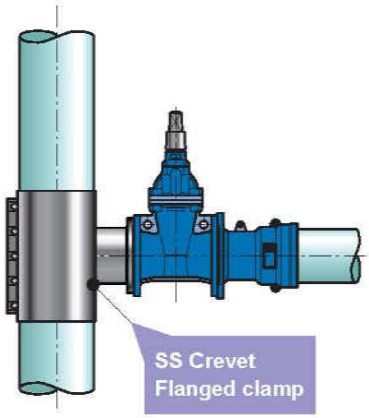
As with most pipe materials Irontite® ductile iron pipe cannot be direct tapped but will require either a tapping band, flanged branch sleeve or pre tapped connector, depending on the diameter of the branch required.

Specialist contractors with equipment for live (under pressure) tapping should be used when tapping mains under pressure.

For small off-takes such as service connections, approved tapping bands such as Taptite® polymeric coated ductile iron tapping bands are available. Holes should be drilled using suitable drill bits or hole saws. Only approved tapped bands should be used and the manufacturer's instructions for assembly and connection must be followed at all times. Alternatively pre tapped ductile iron connectors are also suitable.

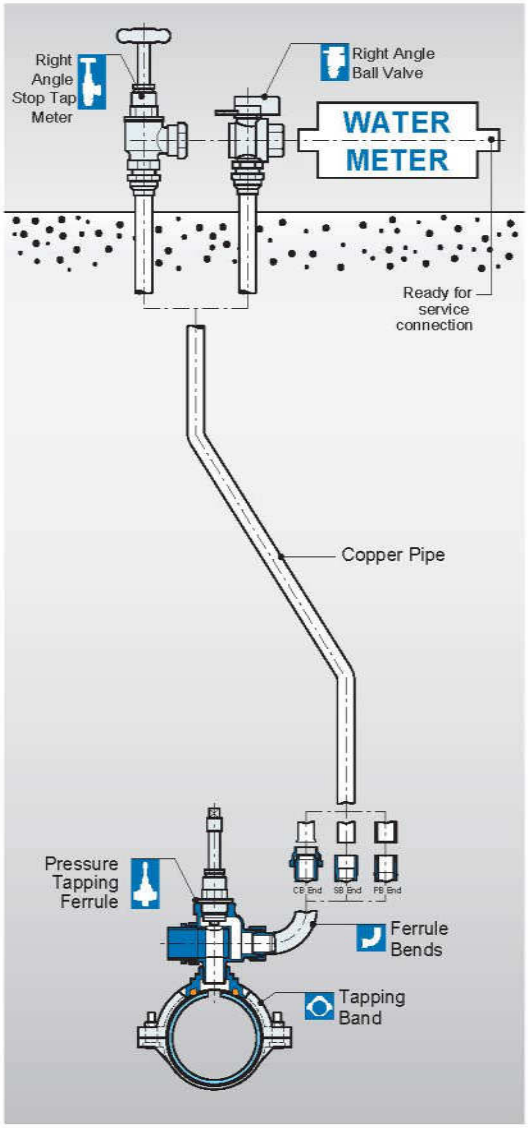
Under Pressure Cut-In

(Utilising stainless steel flanged clamp)

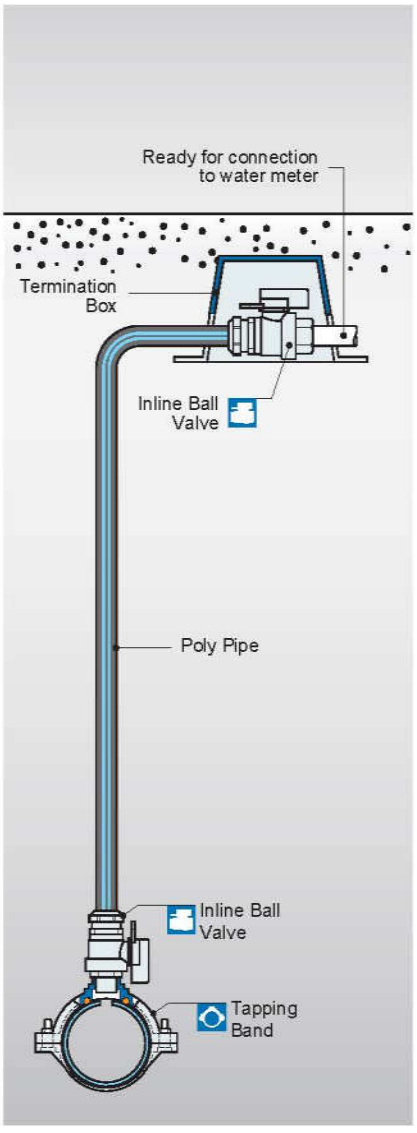


Typical service connections

Post installation assembly (tapping under pressure). Guide only.



Dry tapping assembly (unpressurised tapping). Guide only.



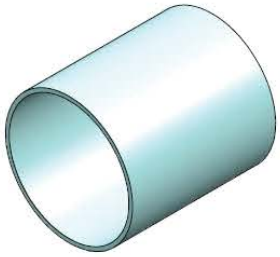
Note:

1. Approved Crevet® stainless steel tapping clamps or Taptite® tapping bands are suitable for use with under pressure and dry tappings.
2. Service connections (under pressure or dry) may be dependant on local requirements.
3. If the pipe sleeving is disturbed or damaged when tapping, it must be repaired. The embedment around the tapping must also be the same as around the rest of the pipe.
4. The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex Pipelines.

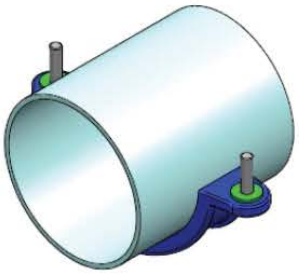
Installation Guidelines

Taptite® Tapping Bands

1. Prepare the area of the pipe to be covered by the tapping bands by removing all dirt and loose materials.

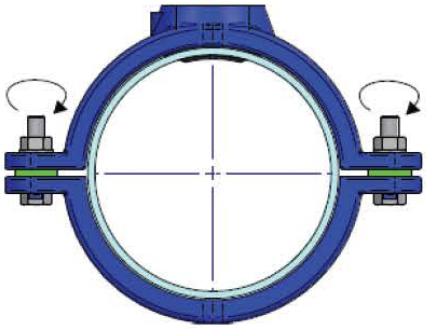


2. Position the bottom half of the tapping band with bolt and spacer in place making sure it is away from the scored, pitted, damaged areas, as this will not provide a good sealing area.

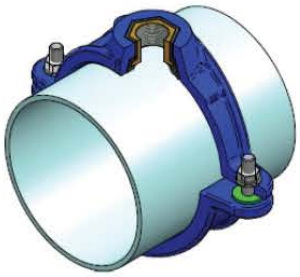


3. Fit the top of the tapping band around the pipe so that the bolts pass through the bolt holes in the top tapping band. Make sure the seal nut is properly placed inside the top tapping band.

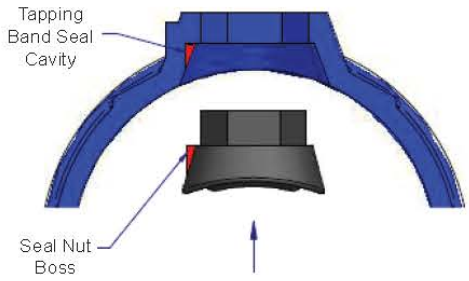
4. With one hand underneath the bottom half of the tapping band pressing upwards, locate the bolt and screw on the washers and nuts supplied. Finger tighten the nuts so that the gap between the two halves of the tapping band is equal on both sides. Tighten the nuts to the tightening torques as shown on the label. Tighten the nuts to 15ft/lbs (20Nm)



When installing tapping bands with seal nuts, make sure the seal nut is in the correct position. The seal nut should be placed in the seal cavity of the tapping band with the extended boss on the seal nut sitting in the seal cavity. Also, the boss on the top half of the tapping band serves as an indication for the direction of insertion for seal nut



Cut out section view of the Tapping Band assembly



How to fit the "Inliner" sleeve to ductile iron pipe walls for tuberculation free service connections

1. After having drilled the main and removed the drilling machine from the shut-off ferrule cock, fit the In-liner sleeve to the plunger of the In-liner inserter. Screw the inserter, with the plunger fully retracted into the top of the ferrule cock and firmly tighten.

2. Open the plug cock and with gentle pressure on the plunger, "feed" the In-liner down through the plug and into the drilled hole of the pipe wall.

3. Push down firmly on the plunger until the handle is almost flush with the gland on the In-liner inserter body. The correct insertion of the In-liner sleeve will be evidenced by the travel of the plunger and the operator will feel the barbs on the in-liner sleeve coming into contact with the drilled hole.

The In-liner sleeve can be inserted under static mains pressure conditions or with water flowing from the ferrule outlet. However, mains pressure on the end of the plunger will cause the plunger to be pushed upwards when hand pressure is reduced on the plunger handle. Whilst the In-liner Inserter is designed so that the plunger is captive in the unit,

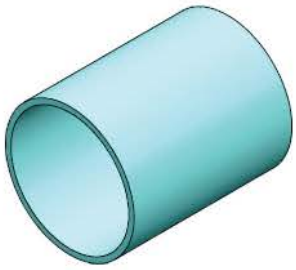
The installation is completed by ensuring that the plunger is fully retracted, turning the ferrule off by rotating the plug cock, removing the In-liner Inserter and replacing the jumper valve cap or bonnet in the ferrule cock body.

Ferrule cocks must have full bore machining dimensions on the inlet orifice.

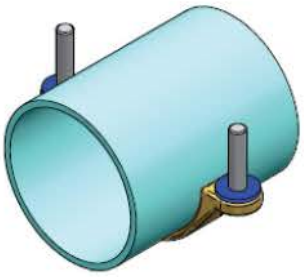
Installation Guidelines

Milnes® Gunmetal Tapping Bands

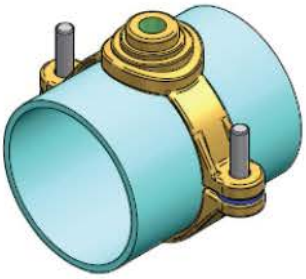
1. Prepare the area of the pipe to be covered by the tapping bands by removing all dirt and loose materials



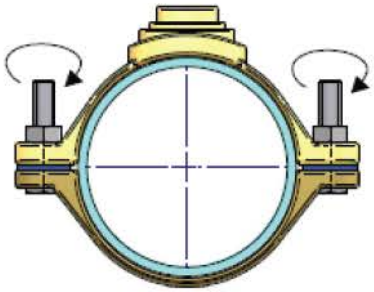
2. Position the bottom half of the tapping band with bolt and spacer (or small O Ring) in place making sure it is away from the scored, pitted, damaged areas, as this will not provide a good sealing area.



3. Fit the top of the tapping band around the pipe so that the bolts pass through the bolt holes in the top tapping band. Make sure the lip seal or O Ring is properly placed inside the top tapping band. The lip seal should be placed in the sealing groove with the sharp inner side of the lip seal facing out towards the pipe or a small moulding line running around the lip seal also indicates this should be facing towards the pipe. If the lip seal is placed in an incorrect position the joint may leak.

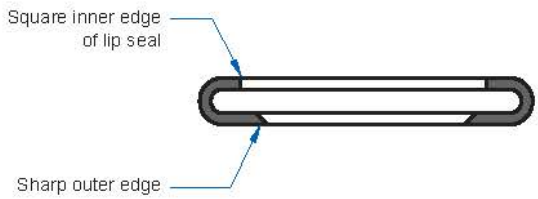


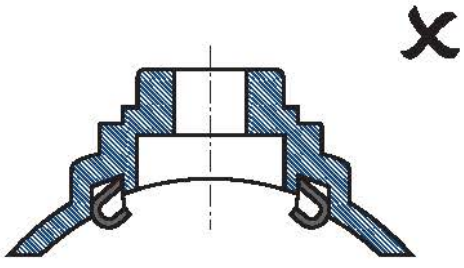
4. With one hand underneath the bottom half of the tapping band pressing upwards, locate the bolt and screw on the nuts supplied. Finger tighten the nuts so that the gap between the two halves of the tapping band is equal on both sides. Tighten the nuts to the tightening torques as shown on the label. Tighten the nuts to 15ft/lbs (20Nm).



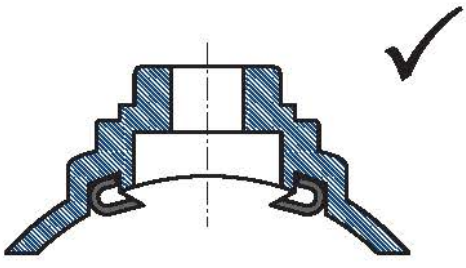
Additional requirements for lip seals

When installing tapping bands with lip seals, make sure the lip seal is in the correct position. The lip seal should be placed in the sealing groove with the sharp inner side of the lip seal facing out towards the pope or a small moulding line running around the lip seal also indicates this should be facing down towards the pipe. If the lip seal is placed in the incorrect position the joint may leak





Incorrect



Correct

Installation Guidelines

Milnes® Standard Pressure Tapping Ferrule Valves

Application

Tapping a water main already under pressure allows services to be connected at a later date without interrupting existing consumers or water services.

For water mains, an added benefit is that keeping the water under pressure at all times prevents having to shut down the water main.

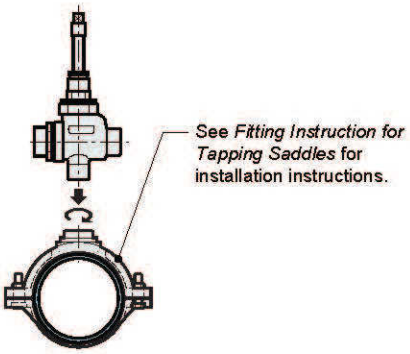
Standard Tapping Machine

Standard hand operated under pressure tapping machines allow tappings of 20 and 25mm to be made in all pipe types without the need for electrical power in remote locations or on new construction sites.

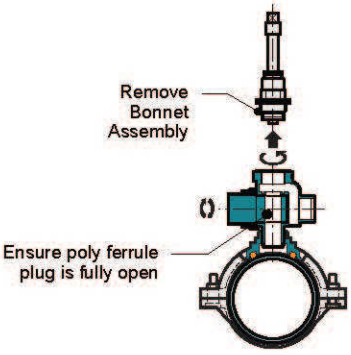
Heavy duty tapping machines suitable for tapping 32, 40 and 50mm are available. See Accessories for details.

Tapping size changes can be made by replacing screw in adaptors to the base of the tapping machine. Hard faced masonry drills are used for tapping AC, CI and DI pipes whilst a fluted hole drill is use for tapping PE and PVC to capture all the slug from the drill hole.

1. Fit an appropriate tapping band to the pipe and screw in the selected under pressure tapping ferrule.



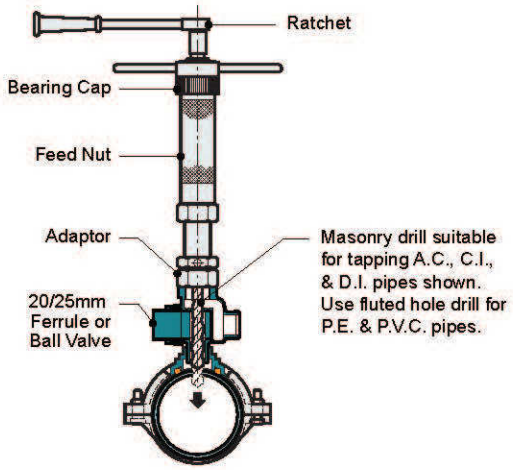
2. Unscrew the bonnet, remove the jumper valve and fully open the poly ferrule plug. *(Note: A ball valve may be used in lieu of the under pressure tapping ferrule where acceptable).*



3. Screw the tapping machine into the top of the ferrule, using the correct adaptor as required.

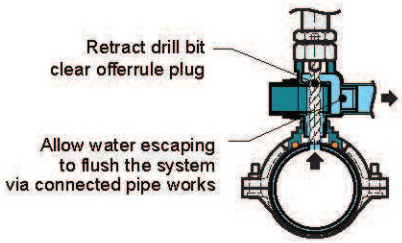
4. Rotate the feed nut until the drill tip makes contact with the pipe.

5. Apply pressure to the drill bit via the feed nut, turning the ratchet at the same time to cut the hole.



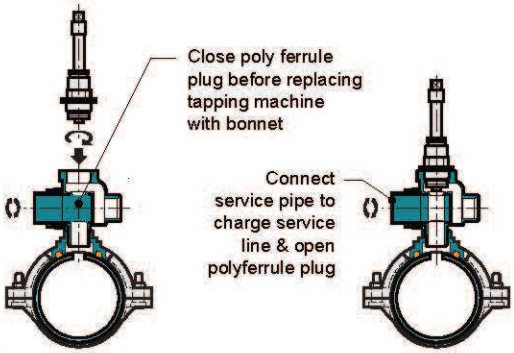
6. When drilling is completed, reverse the feed nut to retract the drill until clear of the poly ferrule plug.

7. Allow water escaping from the ferrule to flush the system, then close the poly ferrule plug. (A hose may be connected to the ferrule to divert the waste water).



8. Remove the tapping machine and replace the jumper valve and bonnet.

9. Connect the service pipe and open the poly ferrule plug to charge the service line.



⚠ Important Operating Instructions:

- Operate by hand only. (Added leverage will damage the machine and the drill bit)
- Minimise sideways movement during operation. (Rocking of the machine will damage the drill bit)
- Always limit the feed rate to ensure a smooth cutting action. (The feed nut may need to be restrained to prevent the drill tip from jamming)
- Do not use the upper handles to retract the feed nut. This may loosen the bearing cap which if removed under pressure will cause the following results:

  (i) Dislodgement of circlip
  (ii) Damage to bearing
  (iii) Injury to operator
- Keep bearing cap screwed on tightly.

Note: The adaptors are supplied with parallel fastening threads. Alternative threads may be supplied on request.

Installation Guidelines

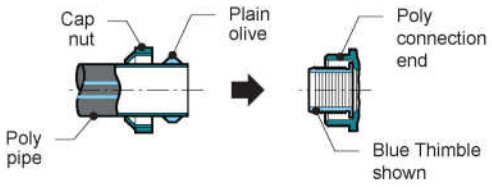
Connection Ends

DN25 PL Poly Connection Details – Thimble/Olive Type

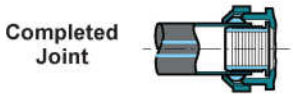
Application

For connection of DN25 PE80 or PE100 Poly Pipe.

1. Place Cap nut and plastic olive over poly pipe to be jointed and insert thimble into the pipe bore. Ensure cut end of poly pipe is square prior to jointing.



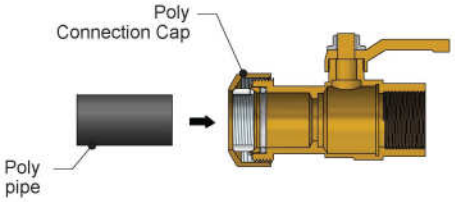
2. Complete joint by tightening the Cap nut over the poly connection end of the fitting or valve.



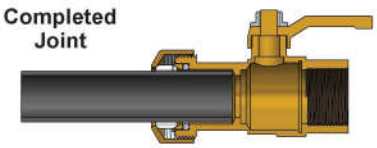
Thimble Type	DN25 PE 80	DN25 PE100
Blue Thimble	PN12.5	PN16/PN12.5
Red Thimble	PN16	-

DN25 PE Poly Connection Details – Push-in Type

1. Ensure cut end of pipe is square and free of burrs prior to jointing. Slightly loosen nut of poly connection cap to allow pipe to be easily inserted.



2. Complete joint by tightening the cap over the poly connection end of the fitting or valve.

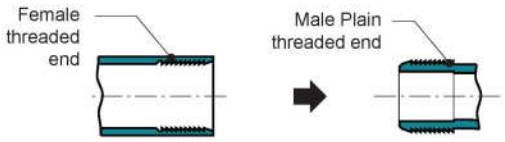


Male Plain Threaded Connection Details

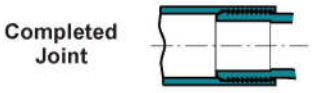
Application

For connection to female threaded sealing pipe threads to AS 1722.1

1. Thread fitting or valve into female threaded end to achieve seal.



2. Complete joint.



Thread Types for All Products

Series 'R' sealing pipe thread external taper pipe thread - AS 1722.1:

- For connection of copper pipe via the use of a compression nut to a fitting or valve.
- Male threads of Ball valves
- Plain thread end of Plain Ferrule bends

Series 'RP' sealing internal parallel thread - AS 1722.1:

- Female threads of Tapping Bands
- Female threads of Ball Valves

Series 'G' fastening pipe thread internal thread - AS 1722.2:

- Female threads of all fastening nuts and compression nuts

Series 'GB' fastening pipe thread external thread Class B - AS 1722.2:

- Male threads of all fastening nuts and compression nuts

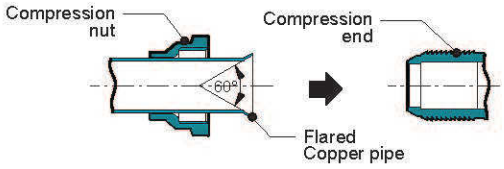
Installation Guidelines

Copper Compression Connection Details

Application

For connection of copper pipe via the use of a compression nut to a fitting or valve.

1. Place compression nut over copper pipe to be jointed and then flare end of copper pipe to be jointed to approximately 60 degrees using flaring tool. Ensure cut end of copper pipe is square prior to flaring.



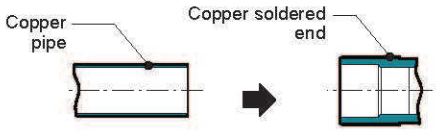
2. Complete joint by tightening the compression nut over the flared copper end onto the compression end of the fitting or valve.

Copper Soldered Connection Details

Application

For connection of copper pipe via the use of a soldered socket.

1. Place copper pipe to be jointed into the plain socket of fitting to be jointed. Ensure cut end of copper pipe is square prior to jointing.



2. Complete joint by soldering to standard requirements.

DN (Nominal Diameter)	Min. ID (mm)	Max. ID (mm)	Minimum ID Length Short Socket (mm)	Minimum ID Length Short Socket (mm)
20	19.07	19.07	7.5	13.5
25	25.42	25.56	7.5	17.0
32	31.77	31.91	7.5	-
40	38.12	38.32	7.5	-
50	50.82	51.02	7.5	-

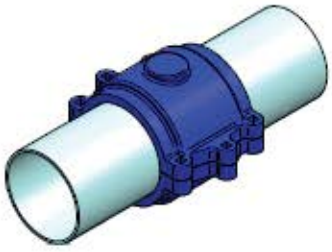
Installation Guidelines

Multi-fit Joint

1. Prepare the area of the pipe to be covered by the multi-fit joint by removing all the dirt and loose materials

2. Position the bottom half of the multi-fit joint with seal in Place. *Note: Approved lubricant to be applied to the surface of the pipe to assist in fitting the joint.*

3. Position the top half of the multi-fit joint with the rubber seal in place

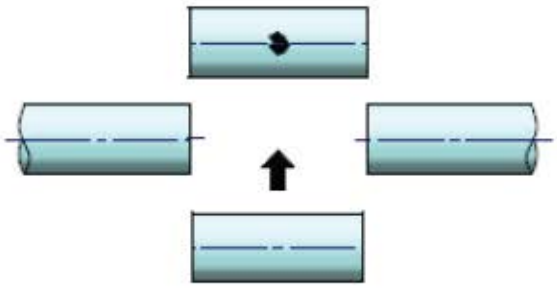


4. Install bolts and associated washes and nuts. Tighten the nuts to the respective tightening torques. *Note: Each multi-fit joint is provided with a tapping boss to facilitate the fitting of an off take if required.*

Removal and replacement of damaged section of pipe

1.

Removal of section of pipe



Replacement of damaged section of pipe

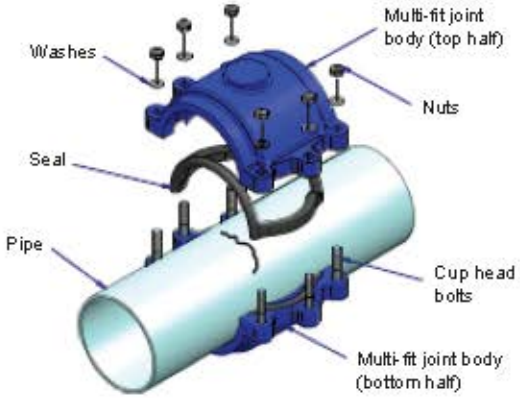
2. Assemble the two multi-fit joints. Ensure that the pipe joints are in the centre of the multi-fit joints.

Note:
Multi-fit joints can be used with:

- *AC Pipe*
- *DICL and CICL Pipe*
- *PVC Pressure Pipes (Series 1 or Series 2)*

Section view of the completed assembly with two multi-fit joints

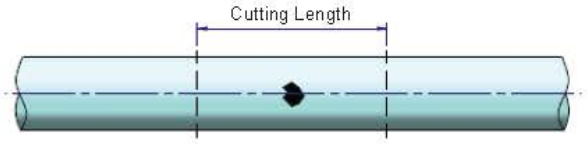
Multi-fit joint assembly components



Installation Guidelines

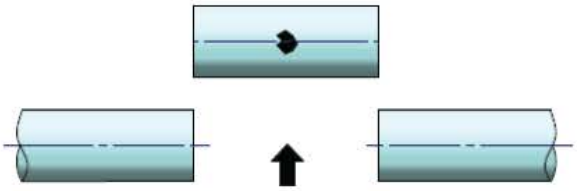
Gibault Joint

1. Mark the section of pipe for fitting or valve or repairing pipe for insertion



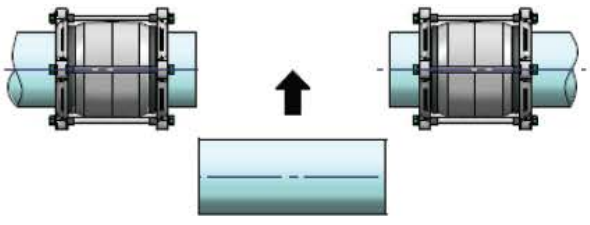
(Cutting Length) = (Fitting/Valve/Pipe insert length) + 2 x (Setting Gap)
Note: Refer note for setting gap.

2. Removal of section of pipe

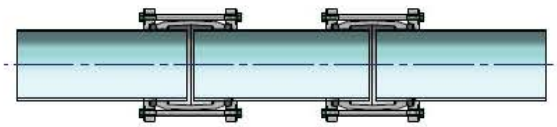


3. Ensure bolting is loose and apply pipe lubricant if required and slide gibault along pipe. If gibault joint will not slide on pipe in loose assembly bolts may be disassembled

4. Insert pipe or spigotted fitting and slide gibault over inserted section. Ensure gibaults are centrally placed over inserted section.
Note: Refer notes given for setting gaps and tightening torques for completion of joint.



Replacement of damaged section or insertion of spigotted tee or valve

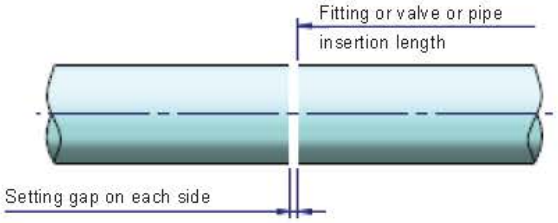


Section view of the completed assembly

Setting Gap:

- Setting gap allowances to be added to length of pipe for each gibault joint
- If deflection is not required then setting gap to be 10 to 20mm on each side of inserted pipe/fitting
- If deflection is required then refer to the table for details

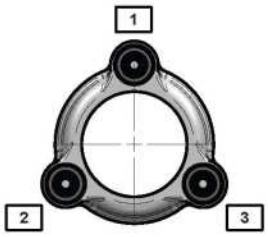
Nominal size (DN)	Max Deflection	Setting Gap	
		Min	Max
100	5.9°	6.0	16.0
150	6.2°	12.0	22.0
200	6.3°	18.0	28.0
225	5.8°	19.0	29.0
250	5.7°	22.0	32.0
300	5.8°	27.0	37.0
375	5.6°	35.0	45.0
450	5.2°	39.0	49.0
500	5.4°	46.0	56.0
600	5.0°	52.0	62.0



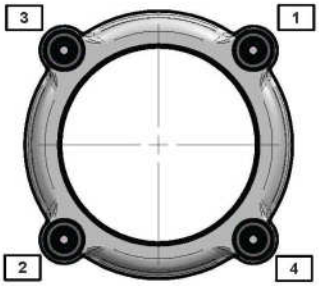
Tightening Torque:

- Recommended tightening torque 50 ± 10Nm
- Nut to be coated with anti galling compound
- Higher torque may be required if no lubrication is applied

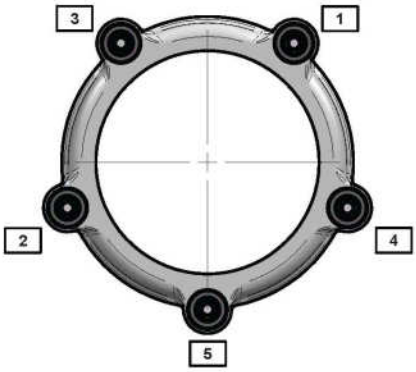
Tightening Sequences



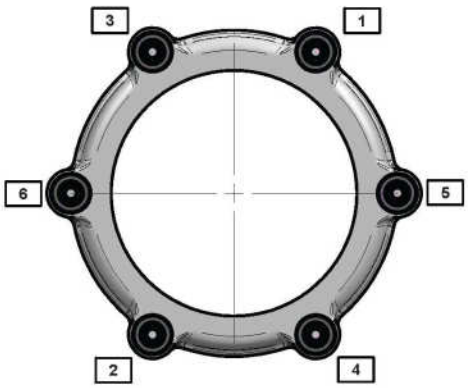
DN100& DN150



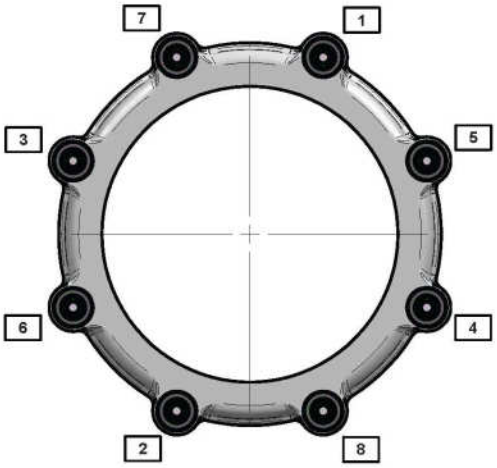
DN200



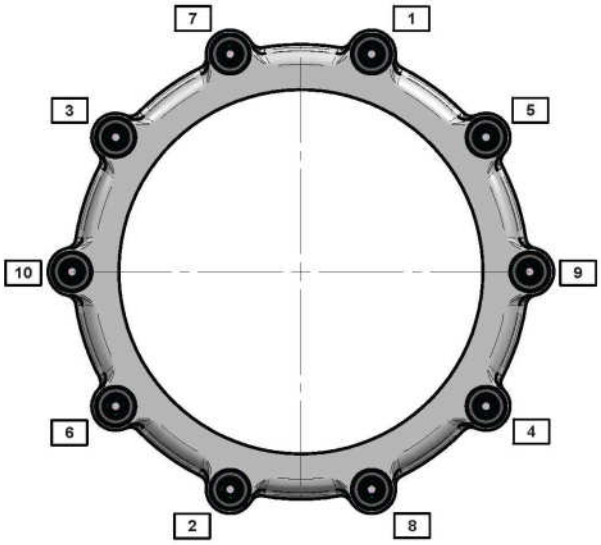
DN225



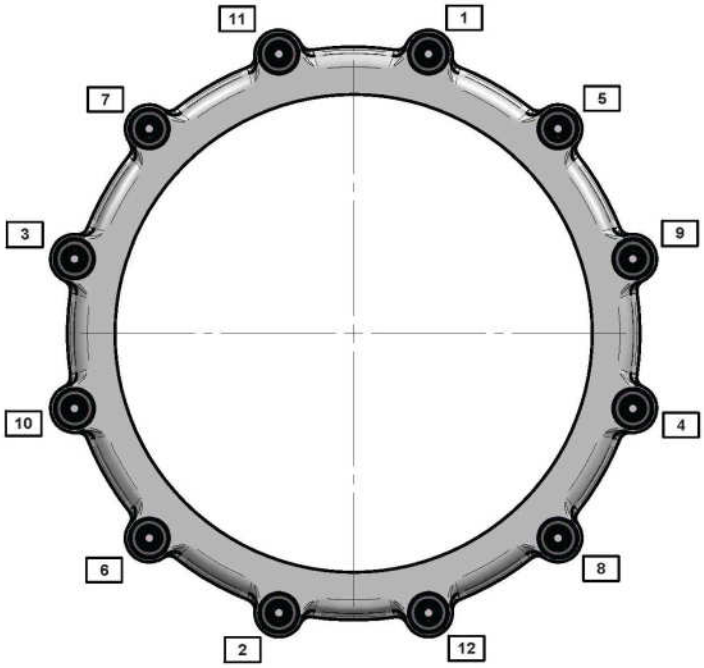
DN250



DN300



DN375 & DN450

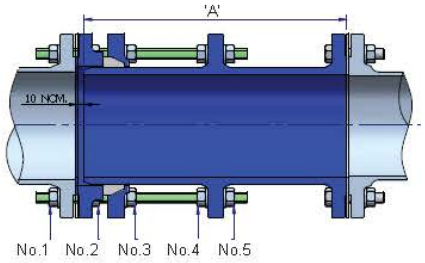


DN500 & DN600

Installation Guidelines

Dismantling Joints Type 'B' (Thrust Type)

Dismantling joints are installed in pipelines to facilitate removal & replacement of valves, pipes or fittings in the line. By removing & adjusting certain stud nuts, the stud & the loosened flanges can be retracted sufficiently to allow for the removal & replacement of the joint & associated pipe or fittings in the pipeline..

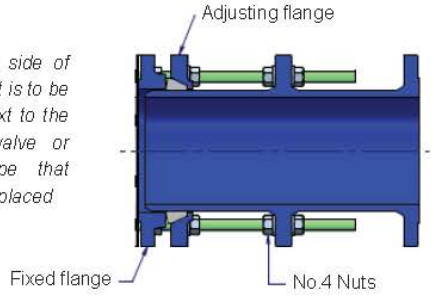


Note: For Type 'B' joints ensure that the flange to flange gap in line is as shown. (The joint assembly shall be supplied to drop directly into the gap)

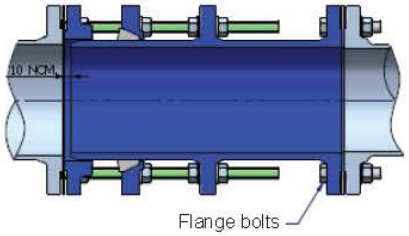
All dismantling joints are supplied loosely assembled & should be installed in the following sequence:

1. Remove the No.1 nuts and associated washers, then place the joint assembly into the gap. Loosen the No.4 nuts to allow the studs to be moved

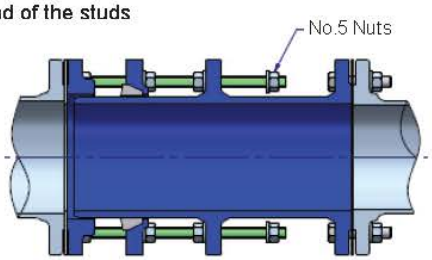
This is the side of the joint that is to be installed next to the fitting or valve or flanged pipe that would be replaced



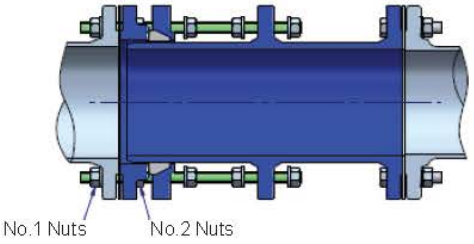
2. Install the standard flange bolts and tighten as per the standard flange bolt tightening practice
Note: Ensure that the flange to flange gap in line is as shown below.



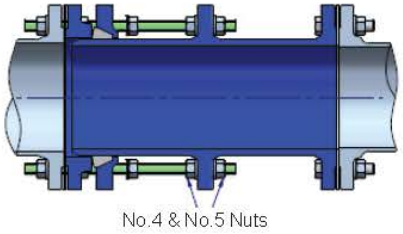
3. Turn the No.5 nuts until they are only a couple of turns from the end of the studs



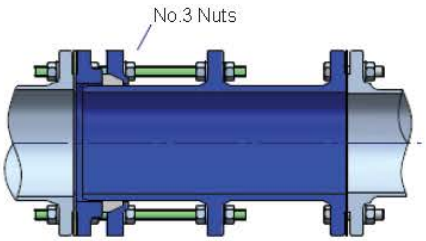
4. Slide the fixed flange, seal, adjusting flange & studs along the spigot of the dismantling joint body until the fixed flange mates evenly to the adjoining pipe/fitting. *(Note: The No.3 nuts will have to be backed off during this operation)*. Tighten the No.1 and No.2 nuts as per standard flange bolt tightening practice



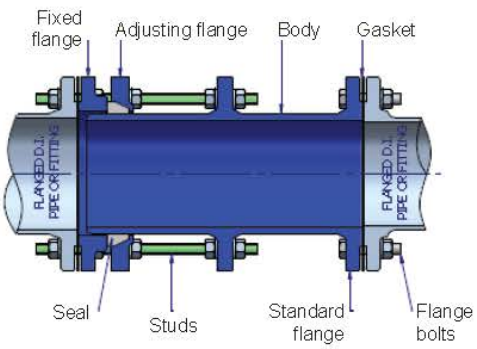
5. Tighten the No.4 and No.5 nuts as per standard flange bolt tightening practice (refer below for torque values)



6. Slide the adjusting flange and seal into position and finger tighten the No.3 nuts. Fully tighten the No.3 nuts in the correct sequence as per standard practice to the approximate tightening torques



Type 'B' Dismantling Joint Components (Thrust Type)

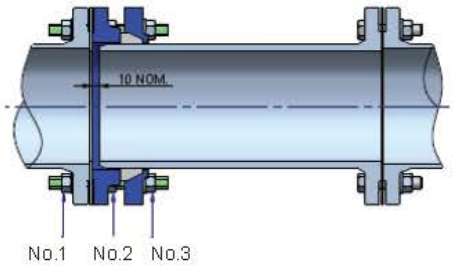


Refer to page 97 for stud and tightening torques, estimating tightening torque valves and typical bolt tightening sequence

Installation Guidelines

Dismantling Joints Type 'D' (Non-Thrust Type)

Dismantling joints are installed in pipelines to facilitate removal & replacement of valves, pipes or fittings in the line. By removing & adjusting certain stud nuts, the stud & the loosened flanges can be retracted sufficiently to allow for the removal & replacement of the joint & associated pipe or fittings in the pipeline

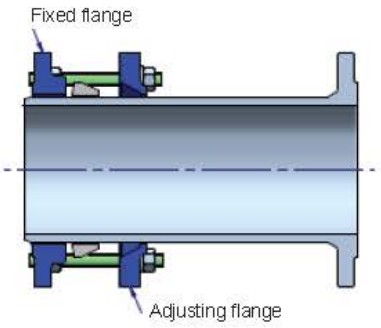


Note: For Type 'D' joints the gap in the line shall be the length of the spigot/ flange pipe or fitting plus 10mm, as shown. (Slide the joint over the spigot end until the pipe or fitting can be directly dropped into the gap).

All dismantling joints are supplied loosely assembled & should be installed in the following sequence.

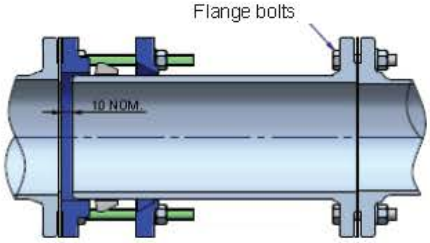
1. Place the dismantling joint assembly onto the spigot/flange pipe or fitting. Remove the No.1 nuts and associated washers from the joint assembly.

This is the side of the joint that is to be installed next to the fitting or valve or flanged pipe that would be replaced

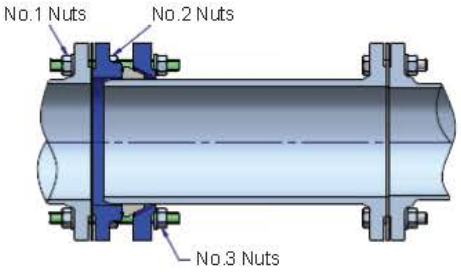


2. Drop the joint assembly along with the spigot/flange pipe or fitting into the gap. Ensure that the No.1 nuts and associated washers are removed. Install the standard flange bolts and tighten as per standard flange bolt tightening practise.

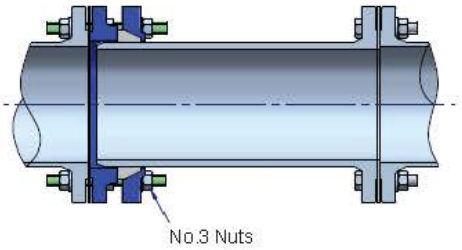
Note: Ensure that the gap in the line is 10mm.



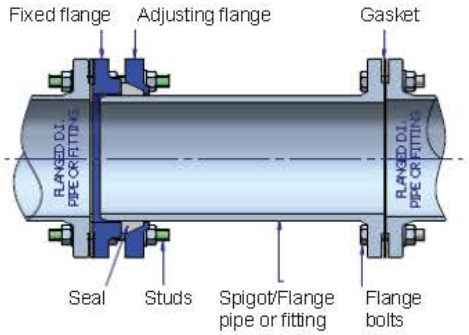
3. Turn the No.3 nuts until they are only a couple of turns from the end of the studs. Slide the fixed flange, seal, adjusting flange and studs along the spigot of the flanged pipe/fitting until the fixed flange mates evenly to the adjoining pipe/fitting. *(Note: The No.3 nuts will have to be backed off during this operation).* Tighten the No.1 and No.2 nuts as per standard flange bolt tightening practice.



4. Slide the adjusting flange and seal into position and tighten the No.3 nuts as per the standard flange bolt tightening practice. (Refer below for torque values)



Type 'D' Dismantling Joint Components (Non-Thrust Type)



Details of stud and tightening torques for Dismantling Joints Type 'B' (Thrust) and Type 'D' (Non-Thrust)

No.3 Nuts PN16

Nominal size (DN)	Type 'D'	
	Stud details	Stud tightening torgue (Nm)
80	4/M16x160	70
100	4/M16x160	70
150	8/M16x160	70
200	8/M16x160	70
225	8/M16x160	70
250	8/M20x180	100
300	12/M20x180	100
375	12/M24x220	130
450	12/M24x220	130
500	16/M24x220	160
600	16/M27x245	160
750	20/M30x280	190

No.3 Nuts PN35

Nominal size (DN)	Type 'D'	
	Stud details	Stud tightening torgue (Nm)
80	8/M16x160	70
100	8/M16x160	70
150	12/M20x180	100
200	12/M20x180	100
225	12/M24x220	130
250	12/M24x220	130
300	16/M24x220	130
375	16/M27x245	160
450	20/M30x280	190
500	24/M30x280	190
600	24/M33x300	220
750	28/M33x300	220

Estimated tightening torque values for Dismantling Joints Type 'B' (Thrust) and Type 'D' (Non-Thrust)

Standard pressure flanges as AS/NZS 4087 Figure B5 PN16 Grade 4.6 galvanised steel bolts and nuts or Grade 316 Class 50 stainless steel bolts and nuts with full face gasket - 3mm gasket rubber

Nominal size (DN)	Bolt size	No. of Bolts	Suggested length of Bolts (mm)	Bolt Tension (kN)	Lightly Oiled (Nm)	Well Lubricated (Nm)
80	M16	4	65	16	60	40
100	M16	4	75	22	80	55
150	M16	8	75	17	60	40
200	M16	8	75	22	80	55
225	M16	8	75	24	85	60
250	M20	12	90	35	155	105
300	M20	12	100	28	125	85
375	M24	12	100	42	220	150
450	M24	12	120	53	280	190
500	M24	16	120	52	275	185
600	M27	16	130	67	400	270
750	M30	20	140	80	530	360

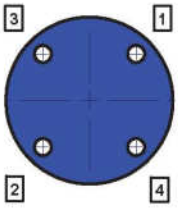
High pressure flanges AS/NZS 4087 Figure B6 PN35 Grade 8.8 galvanised steel studs and nuts or Grade 316 Class 70 stainless steel studs and nuts with full face gasket - 1.5mm fibre gasket

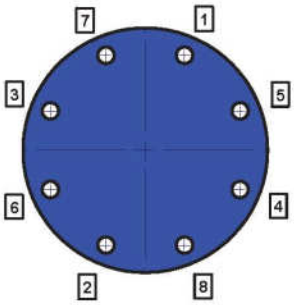
Nominal size (DN)	Stud size	No. of Studs	Suggested length of Studs (mm)	Stud Tension (kN)	Lightly Oiled (Nm)	Well Lubricated (Nm)
80	M16	8	110	41	140	100
100	M16	8	110	52	180	130
150	M20	12	130	66	290	200
200	M20	12	130	93	410	280
225	M24	12	150	108	570	390
250	M24	12	150	118	620	430
300	M24	16	150	110	580	400
375	M27	16	170	141	840	570
450	M30	20	190	150	990	680
500	M30	24	190	156	1030	700
600	M33	24	210	195	1420	970
750	M33	28	210	230	1670	1140

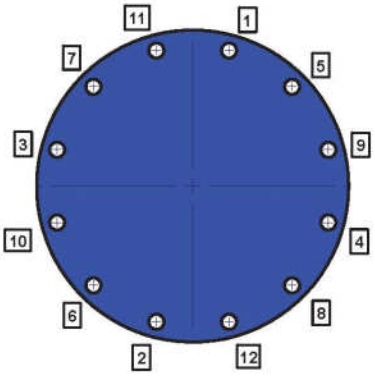
Note:

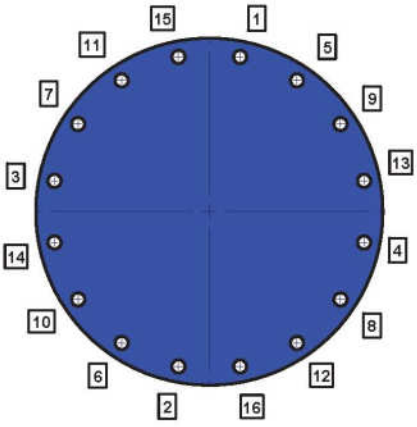
- *For lightly oiled μ=0.22 & for well lubricated μ=0.15*
- *Lightly oiled (basic lubricant)*
- *Well lubricated (lubricant such as Molybond)*
- *Recommended tightening in three steps 30%, 60% & 100%*

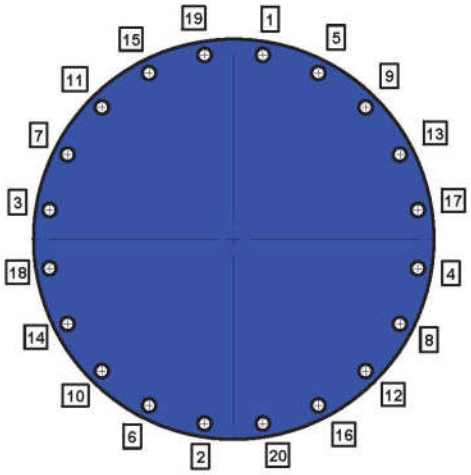
Typical Bolt Tightening Sequence for Dismantling Joints Type 'B' (Thrust) and Type 'D' (Non-Thrust)

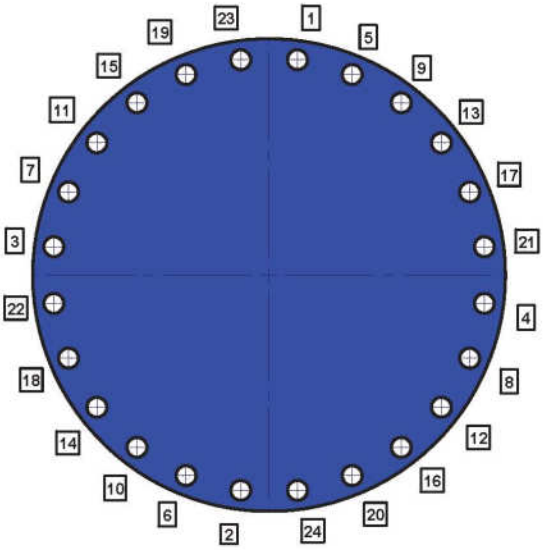


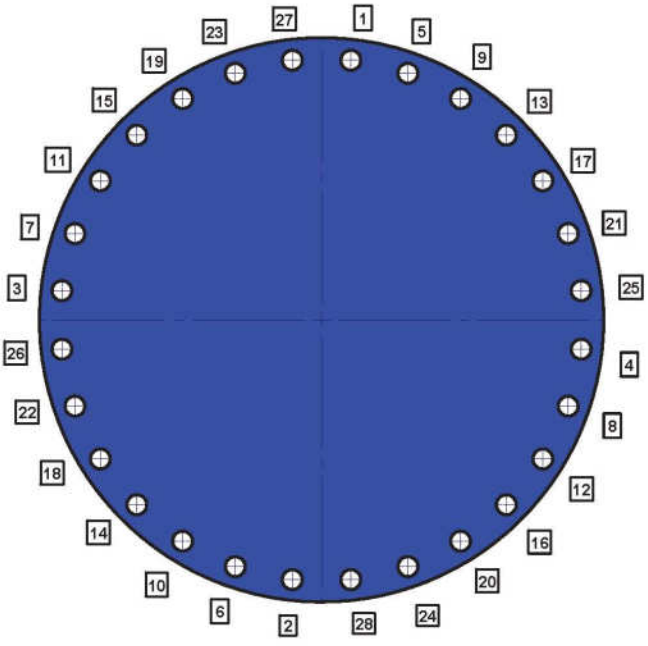












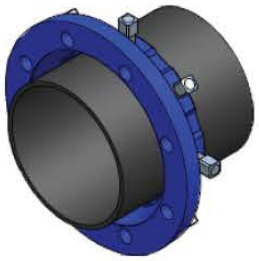
Installation Guidelines

Adapta Flanges

1. Ensure that the end of the pipe is clean and cut square to the centre line of the pipe. The square end shall be deburred as required but shall not be chamfered.

   Note: Adapta Flanges are suitable for Ductile Iron Pipe only.

2. Slide the flange onto the pipe and hand turn the set screws until they lightly touch the pipe circumference, but still allow the flange to slide freely. Ensure that the gap between the inside of the flange and the outside of the pipe is even all round.

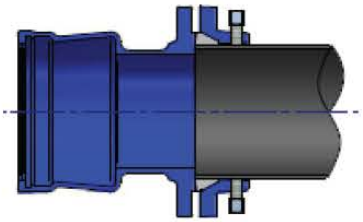


3. Lubricate the seal with an approved lubricant and position on the pipe approximately 5mm from the end.

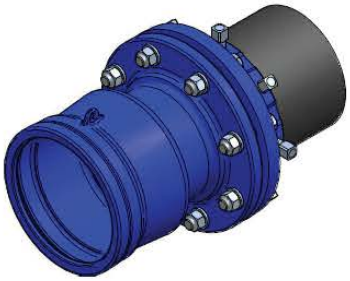
   Note: No other flange gasket is required when using an adapta-flange.

4. Slide the flange forward onto the seal. The seal should fit evenly into the seal cavity.

5. Position the pipe so that the square end is touching the flange face of the mating fittings. When the adapta flange is used as a dismantling joint the gap between the end of the pipe and the mating fitting should be kept to a minimum but shall not exceed 5mm.



6. Install the flange bolts. Tighten gradually and evenly by alternating from side to side in the correct sequence so that the rubber seal is uniformly compressed. Maintain an even gap between the flange faces throughout this operation. Bolt tightening torques shall be as shown in 'Table B'.



7. Ensure that all set screws are touching the pipe circumference before tightening evenly to the torque specified in 'Table A'.

   Note:
   - when the joint is subjected to high vibration, the application of a thread locking compound on the set screws is recommended
   - the maximum water working pressure of the adapta flange joint is given in 'Table A'.

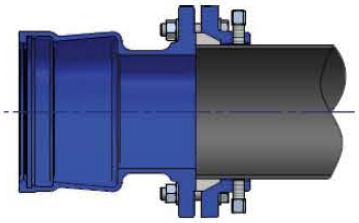
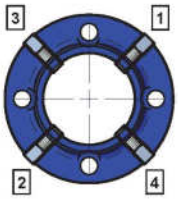


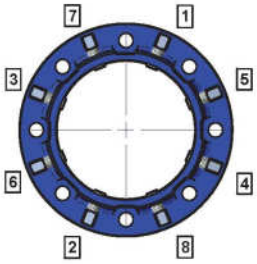
Table A

Nominal Size (DN)	Set screw torque (Nm)	Max. working pressure (kPa)
80	90	1400
100	90	1400
150	120	1400
200	120	1400
225	120	1400
250	120	1400
300	120	1400
375	150	1000
450	150	1000
500	150	1000
600	150	700
750	150	500

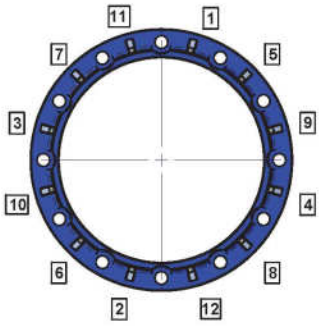
Typical Set Screw Tightening Sequence



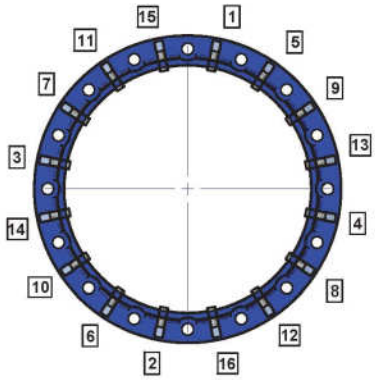
DN80 - DN100



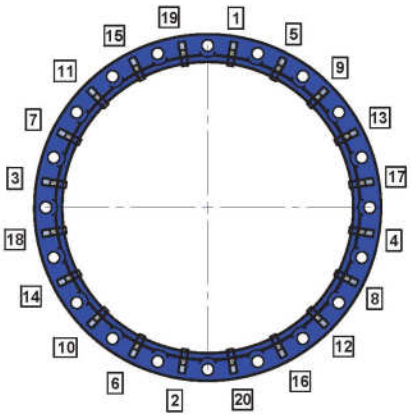
DN150 - DN250



DN300 - DN450

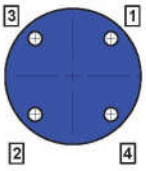


DN500 - DN600

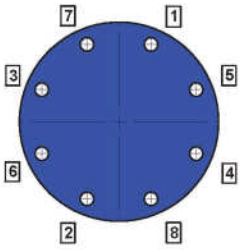


DN750

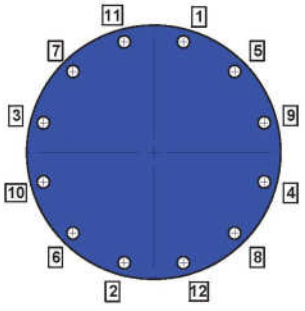
Typical Flange Bolt Tightening Sequence



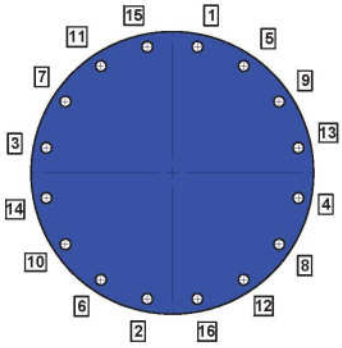
DN80 - DN100



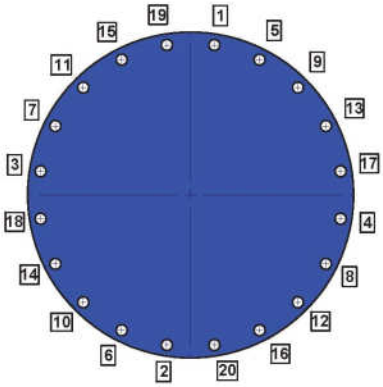
DN150 - DN250



DN300 - DN450



DN500 - DN600



DN750

Table B

Nominal Size (DN)	Bolt size	Lightly Oiled (Nm)	Well lubricated (Nm)
80	M16	60	40
100	M16	80	55
150	M16	60	40
200	M16	80	55
225	M16	85	60
250	M20	155	105
300	M20	125	85
375	M24	220	150
450	M24	280	190
500	M24	275	185
600	M27	400	270
750	M30	530	360

Installation Guidelines

Stainless Steel Clamps

Stainless steel clamps are suitable for tapping and repairing pressure pipelines up to PN16 (1600KPa). Clamps are designed to wrap around steel, ductile iron, GRP and PVC pipes (Refer to limitations of use). For other pipe materials contact Iplex Metals for further information.

All clamps are manufactured from 316 Stainless steel, and can be used for above and below ground installations. The standard sealing gasket or 'mat' is nitrile rubber complying with AS 1646 - 'Elastomeric seals for water works purposes'.

Note: Stainless steel repair clamps are not recommended for joining two pipe ends.

Compliance

'Stainless steel clamps for waterworks purposes'. The schedule lists the range of certified products and can be summarised as follows;

- Repair clamps for all sizes up to and including DN300
- Tapped clamps for all sizes up to and including DN300 with 20mm and 25mm BSP threaded tappings.
- Flanged clamps for all sizes up to and including DN300 with DN80, DN100 and DN150 flanges.

Note: Sizes greater then DN300 are manufactured to the same requirements with a maximum clamp length of 600mm. Contact Iplex Metals for recommended allowable pressure ratings.

Limits on the use of stainless steel clamps

Stainless steel repair clamps, tapped clamps and flanged clamps are not recommended for use with highly pressurised polyethylene (PE) pipes. Clamps may be suitable with low pressurised PE mains, but will require confirmation from Iplex Metals.

Stainless steel clamps may also be limited in their suitability when repairing thin walled PVC pipes. As a result Iplex Metals are developing a full circle Type F clamp for flexible pipes.

The Type F clamp is designed to:

- support the full circumference of the pipe
- prevent over tightening and crushing and
- prevent leakage after depressurising a tapped pressure main.

Recent developments with stainless steel clamps

A new standard WSA 122-2009 has been introduced by WSAA (Water Services Association of Australia) for 'Flanged clamps'. The new specification follows the requirements of AS/NZS 4793-2009 'Mechanical tapping bands for waterworks purposes'.

The purpose of the new specification WSA 122-2009 is to allow for recently developed clamps suitable for both rigid and flexible pipe materials. Type 'R' (rigid) clamps are suitable with rigid pipes such as ductile iron and Type 'F' (flexible) clamps with flexible pipes such as PVC. These newly developed clamps provide full circle support, which prevents over tightening.

Clamps are clearly marked as 'Type R' or 'Type F' or 'Type F and R' for identification and traceability.

Note: The new standards exclude clamps suitable for Polyethylene (PE) pipe applications.

AS 4181 'Stainless steel clamps for waterworks purposes' will be reviewed and will exclude 'flanged outlet clamps'.

Select the correct clamp

1. Ensure the correct clamp is selected for the appropriate pipe material and application. E.g. Type F (flexible) for PVC pipe or Type R (rigid) for DICL pipe.
2. If repairing a damaged pipe, the size range and length of the repair clamp also becomes critical. For further information refer to the stainless steel clamp tables.

Pipe preparation

3. Ensure the pipe surface is clean and smooth and does not contain grease, dirt, scores or rust, which could reduce the sealing capabilities of the clamp. If the pipe surface is badly pitted or uneven, it will require extra preparation.

Clamp installation

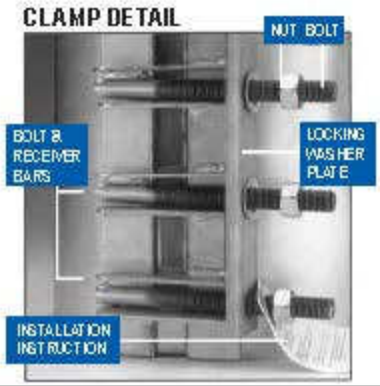
4. Undo the clamp leaving the nuts on the ends of the bolts.
5. Lubricate the rubber mat and pipe with an approved pipe jointing lubricant
6. Fit the clamp around the pipe and bring the parts together using the lock washer plate. Ensure the rubber mat is correctly located and clean.
7. Lock in place and squeeze the lugs together while spinning the nuts down.
8. Prior to tightening the nuts, ensure the clamp is correctly located and has not moved.

Tightening the nuts

9. Tighten each nut evenly, starting from the centre and working outwords. Ensure all nuts are tensioned to the recommended torque, usually 80Nm to 100Nm.
10. Allow the rubber mat to seat and re torque to the recommended tension.

Installation procedures for Flanged off take clamps

The installation guidelines above can be used for Flanged off take clamps provided the flanged outlet is positioned correctly. It is very important that any valve or assembly attached to the flange is supported fully and aligned to eliminate any stress on the clamp. Refer to the installation instructions attached to the clamp or contact Iplex Metals for further information.



6.0 Field pressure testing – Irontite® seal coated DICL pipes

Background – Cement mortar lining with seal coat

Many Australian water authorities specify ductile iron pipes, with a seal coating. This seal coating is factory applied to the cement mortar lining to ensure the water quality is not adversely affected when the pipe is in service. This is particularly the case during periods where the water flow through the pipe is low; such as would be experienced in newly developed sub-divisions.

The Australian ductile iron pipe standard AS/NZS 2280, stipulates that seal coats must comply with strict standards of hygiene and must also meet an effectiveness standard contained within the international standard, ISO 16132. For a seal coat to be effective, it must restrict the passage of alkaline water from the cement mortar, into the pipeline. The more effective a seal coating is at preventing the transfer of water, the better it is at maintaining good water quality.

Leakage Testing

Because the function of a seal coat is to restrict the free flow of water to and from the cement mortar lining, it stands to reason that better quality seal coats will restrict the rate at which pipe linings absorb and release water. This fact needs to be considered when new pipelines are subject to acceptance pressure testing.

The Australian Standard for the installation of buried flexible pipelines (which includes DICL) AS/NZS 2566.2 deals with Field Testing in Section 6. However this section does not recognise the need for soaking cement lined pipelines at test pressure. This can lead to difficulties in achieving a satisfactory pressure test result, due to the additional volume of water absorption by the cement mortar lining, while under test.

However, the test procedures detailed in the International Standard 'ISO 10802 Ductile iron pipelines – Hydrostatic Testing After Installation' and the USA's AWWA Manual of Water Supply Practices M41 both recognise that cement mortar linings, especially those protected by effective seal coats, require a period of soaking at full test pressure, to ensure full saturation of the cement mortar lining is achieved.

The Water Supply Code of Australia WSA 03 – 2002 V2.3 also provides test procedures in section 19.4.4 which recommends lines should be pressurised to 75% of the test pressure for a minimum of 12 hours, prior to conducting a pressure test.

To avoid misleading results when pressure testing Irontite® seal coated ductile iron pipes, Crevet/Iplex Pipelines support the above recommendations, i.e. The pipeline is pressurised and maintained at 75% of test pressure for at least 12 hours, or for a longer period to ensure the cement mortar lining is saturated and pipeline pressure stabilises. This may require several cycles of pressurisation prior to commencing the test.

6.1 Test procedure

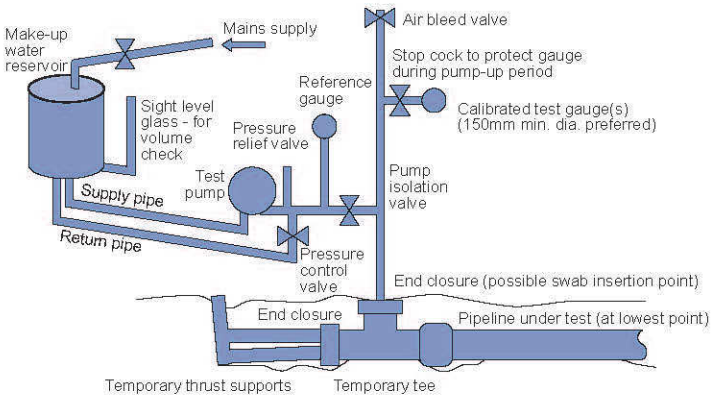
The test procedures of the international standard 'ISO 10802 Ductile iron pipelines – Hydrostatic testing after installation' and ' Water Supply Code WSA 03-2002 V2.3' are recommended for Irontite® pipe.

Both standards specify site hydrostatic acceptance tests for installed pressure ductile iron pipelines used for conveying water and other liquids.

The recommended test pressure should not be less than the maximum design pressure and at the same time not exceed 1.25 times the pipe rating at any point along the pipeline, or exceed the maximum test pressure specified in the standards applicable to pipes, fittings, flanges, accessories and the design pressure of the restraining or anchoring devices.

Prior to carrying out a hydrostatic test it is normal to complete the pipe installation including the backfilling and allow sufficient time to elapse to allow for curing of concrete thrust and anchor blocks. It is recommended that mechanical joints and flanged connections remain exposed so that they can be visually checked for leaks. Where testing against closed valves, arrangements should be made for checking these for leaks.

Section 5 of ISO 10802 and Appendix M of AS/NZS 2566.2 describes the test procedures and Fig.18 illustrates the usual test equipment arrangement.

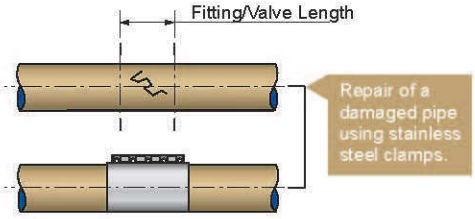


6.2 Field Repairs

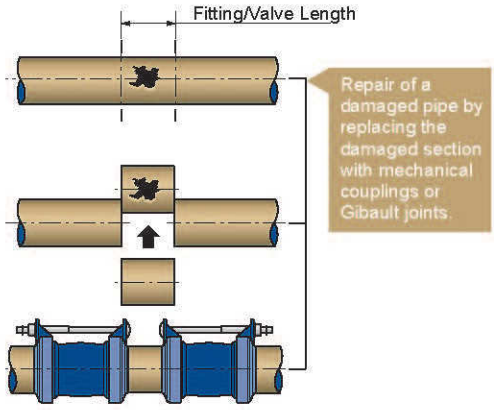
Approved Gibault joints/mechanical couplings can be used for repairing ductile iron pipes. For minor cracks, stainless steel repair clamps are available.

The following illustrations provide details of typical pipe repair methods and cut-ins.

Minor repairs

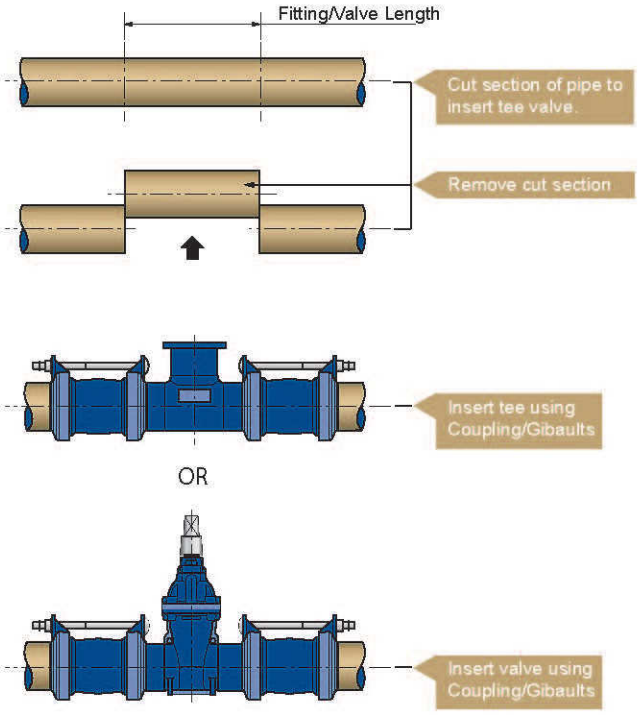


Major repairs



Post installation – Cut-ins

(typical spigoted valve or fitting insertion with Gibault or mechanical joints)



General information

The following tables provide pipe outside diameters (OD) for various pipe materials by nominal diameter (DN). These dimensions are indicative only. If critical, dimensions and tolerances can be obtained from the relevant standards.

Pressure pipes

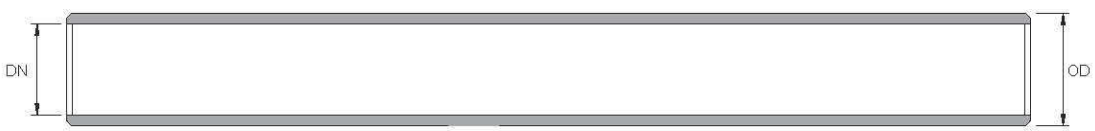
Pipe Material	Class	Standard	DN																							
			50	65	80	100	125	150	175	200	225	250	300	350	375	400	450	500	525	600	675	750	900	1000	1100	1200
			Pipe OD																							
DICL	PN20 or PN35	AS/NZS 2280	-	-	96	122	-	177	-	232	259	286	345	-	426	-	507	560	-	667	-	826	-	-	-	-
GRP	PN6 to PN32	AS/NZS 3571	-	-	-	-	-	-	-	-	-	-	345	-	426	-	507	-	587	667	747	826	924	1026	-	1229
CICL	Class B	AS 1742.2	-	-	-	122	-	177	-	232	259	286	334	-	413	-	492	545	-	650	-	-	-	-	-	-
CICL	Class C	AS/NZS 2544	-	-	96	122	149	177	203	232	259	286	345	-	426	-	507	560	-	667	-	-	-	-	-	-
AC	Class AB	AS 1711	-	-	96	122	-	177	-	232	259	286	334	-	413	-	492	-	572	650	-	-	-	-	-	-
AC	Class CD	AS1711	-	-	96	122	-	177	-	232	259	286	345	-	426	-	507	-	587	667	747	826	-	-	-	-
PVC-U	Series 2 (Blue)	AS/NZS 1477	-	-	-	122	-	177	-	232	259	286	345	-	426	-	-	-	-	-	-	-	-	-	-	-
PVC-U	Series 1 (White)	AS/NZS 1477	60	75	89	114	140	160	-	225	250	280	315	-	400	-	-	-	-	-	-	-	-	-	-	-
PVC-m	Series 2 (Blue)	AS/NZS 4765	-	-	-	122	-	177	-	232	259	286	345	-	426	-	507	-	560	667	-	-	-	-	-	-
PVC-m	Series 1 (White)	AS/NZS 4765	60	75	89	114	-	160	-	225	250	280	315	-	400	-	500	560	-	630	-	-	-	-	-	-
PVC-o	Series 2 (Blue)	AS/NZS 4441	-	-	-	122	-	177	-	232	259	286	345	-	-	-	-	-	-	-	-	-	-	-	-	-
Steel	MSCL	AS 1579	-	-	-	114	-	168	-	219	-	273	324	355	-	457	508	559	-	660	-	762	960	1016	-	1290
Galvanised Steel	GWI	AS 1074	60	76	89	114	140	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PE	PN12.5 or PN16	AS/NZS 4130	50	63	75	90/ 110	125/ 140	160	180	200	225	250/ 280	315	355	-	400	450	500	560	630	710	-	900	1000	-	1200
CU	All Classes	AS 1432	51	64	76	102	127	152	-	203	229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: The above chart is to be used as a guide only. Refer to the applicable standard for pipe outside diameter tolerances.

Non-Pressure pipes

Pipe Material	Class	Standard	DN																							
			50	65	80	100	125	150	175	200	225	250	300	350	375	400	450	500	525	600	675	750	900	1000	1100	1200
			Pipe OD																							
VC	-	AS1741	-	-	-	138	-	194	-	-	280	-	370	-	450	485	535	-	635	710	-	-	-	-	-	-
FRC	1,2,3,4	AS4139	-	-	-	126 - 135	-	187 - 189	-	-	264 - 283	-	346 - 369	-	429 - 457	-	515 - 548	-	601 - 644	686 - 735	750 - 800	809 - 874	-	-	-	-
RC	Class 2-12	AS/NZS 4058	-	-	-	-	-	197	-	-	279	-	362	-	445	-	533	-	616	699	787	870	946	1029	1105/ 1194	1270/ 1354
AC	35	AS1712	-	-	-	120	-	177	-	230	257	283	336	-	419	-	497	-	576	657	-	-	-	-	-	-
AC	50	AS1712	-	-	-	122	-	183	-	230	262	289	344	-	425	-	505	-	585	664	-	-	-	-	-	-
CI	Soil	AS1631	-	-	85	114	140	165	-	-	244	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-
PVC-U	DWV	AS/NZS 1260	56	69	83	110	-	160	-	-	250	-	316	-	401	-	-	-	-	-	-	-	-	-	-	-
CI	SWV	EN877	58	-	-	110	135	160	-	210	-	274	326	-	-	429	-	532	-	635	-	-	-	-	-	-

Note: The above chart is to be used as a guide only. Refer to the applicable standard for pipe outside diameter tolerances.



Notes

Notes

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