iplex®

Technical Guide

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Metals Technical Guide

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1.0 Introduction

Ductile iron pipe

Superior strength: Ductile iron possesses approximately twice the strength of grey iron, as evidenced by tensile, beam, ring bending, and bursting tests. It also boasts significantly higher impact strength and elongation.

Industry standard: Since its introduction to Australia in the 1950s, ductile iron pipe has been recognized as the industry standard for water and wastewater systems. Decades of field experience have confirmed its strength, durability, and reliability.

Robust design: Irontite® ductile iron pipes and Crevet® ductile iron fittings are designed and manufactured to meet industry quality standards (*AS/NZS 2280 Ductile Iron Pipes and Fittings* Section 2.2). Suitable for the most demanding conditions, they handle water hammer, deep and shallow trenching with traffic loads, and unstable soils when installed according to industry recommendations.

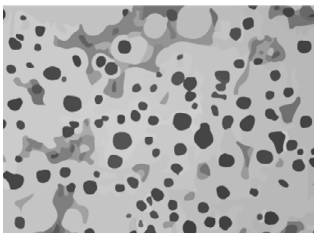
Specifications: Irontite pipes are typically manufactured in standard 5.5-metre effective lengths, with diameters ranging from DN100 to DN750 and pressure classification PN35. Flanged pipes are available with PN16 or PN35 flanges upon request.

Protective linings: The Irontite range is supplied with a cement mortar lining and a bituminous seal coating for potable water applications (DN100 to DN750). This seal coating is essential for maintaining water quality in pipelines with low flow rates.

Corrosion resistance: All Irontite pipes come with a corrosion-resistant Zn AL protective coating, finished with epoxy layers on the external surface. This coating can extend the service life of the pipeline in various soil types and conditions. Advanced specialty coatings are available for aggressive soil applications. For more information, please contact Iplex.

History of ductile iron pipe

Comparison of metal characteristics of grey iron and ductile iron



Ductile iron

Grey iron

- **Microstructural differences:** As illustrated in the photomicrographs, ductile iron (left) differs from grey iron (right) in that its graphite is spheroidal, or nodular, instead of the flake form found in grey iron. This microstructural change imparts greater strength, ductility, and toughness to ductile iron.
- **Legacy of grey cast iron:** The strength and durability of ductile iron's predecessor, grey cast iron pipe, is well-documented. The first official record of a grey iron pipe installation dates back to 1455 in Germany. In 1664, French King Louis XIV commissioned a 24-kilometre grey iron pipe main from Marly-on-Seine to Versailles to supply water to the fountains and town. This pipeline served the palace gardens for over 340 years.
- **Superior strength and toughness:** Ductile iron surpasses grey iron in strength and toughness while retaining its desirable qualities. Although its chemical properties are similar to those of grey iron, ductile iron benefits from significant casting refinements, additional metallurgical processes, and superior quality control.
- **Unique microstructure:** The microstructure of ductile iron is distinct from that of grey iron. In ductile iron, the graphite forms spherical nodules rather than flakes, as seen in grey iron.
- This nodular structure inhibits crack propagation and provides enhanced ductility, which is the hallmark of ductile iron. The formation of these nodules is achieved by adding nodulizers, typically magnesium, to molten iron during manufacturing. As a result, ductile iron exhibits approximately twice the strength of grey iron, as determined by tensile, beam, ring bending, and bursting tests. Its impact strength and elongation are also significantly greater.

Ductile iron fittings

- **Standards compliance:** Ductile iron fittings for use with ductile iron, PVC, and GRP pressure pipes are manufactured and tested per AS/NZS 2280.
- **Range and sizes:** These fittings cover all necessary components for typical water supply systems in sizes DN80 to DN750, with socket, spigot, and flanged joints. Socket options include:
  - Griptite® for Series 2 pipe sizes
  - Nortite® for Series 1 pipe sizes
  - Standard sockets for both Series 1 and 2 with adaptor seals
- **Compatibility:** Spigoted ductile fittings are compatible with ductile iron sockets of the same nominal size. **Note that ductile iron spigots must not be used with PVC or GRP pipe sockets.**
- **Flange use:** Ductile iron flanges, rated PN16 or PN35 (AS/NZS 4087), are typically used for water supply and plant work. **Note that ductile iron flanges, which are now often raised face, must not be directly mated with plain-faced steel or GRP flanges without a spacer flange.**

- **Coating and corrosion protection:** Ductile iron fittings come with a polymeric coating per AS/NZS 4158, eliminating the need for additional corrosion protection in natural soils.
- **Complete system:** A full range of ductile iron fittings, valves, and accessories is available to complete pipeline systems.

1.1 Advantages

Throughout Australia, 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 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 recognised for its capacity to withstand beam loads in above ground installations.

Corrosion resistance

- **Irontite Ductile Iron Pipe:** Features external zinc aluminum (Zn AL) coating and a 2-part epoxy coating for superior corrosion protection. Polyethylene sleeving can be added during installation for extra protection in harsh environments. For specialized needs, contact Iplex.
- **Crevet ductile iron fittings:** Come with a thermal-bonded polymeric coating, eliminating the need for polyethylene sleeving.

High impact resistance

- **Irontite toughness:** Whilst care should always be taken to minimise the possibility of damage, Irontite's superior toughness means it is able to withstand the rigors of on-site handling.

Ductile iron fittings and accessories

- **Complete range:** Available for flexible design and construction. For more information, refer to the product range in this catalogue or contact Iplex if the required product is not listed.

Crevet SL® ductile iron fittings

- **Light-weight:** Easier to handle and install minimising occupational health and safety risks.

Flow characteristics

- **High efficiency:** Irontite cement mortar lined pipes have a low friction coefficient (Colebrook White roughness coefficient k=0.03mm), resulting in high flow capacity, low head loss, reduced pumping costs, and energy savings over the pipeline's lifespan.

Low maintenance

Durable: Zinc-coated ductile iron pipes and polymeric coated fittings require minimal maintenance when installed in accordance with manufacturer's requirements.

High-pressure

High-pressure applications: Irontite pipes are ideal for high-pressure scenarios, providing extra safety against water hammer.

Ease of installation

Efficient lengths: Available in 5.5 metre lengths, improving laying efficiency and reducing installation costs.

Jointing

Simple assembly: Irontite pipes come with spigot x socket rubber ring joints for easy assembly and jointing, saving time and money. Flanged joints are also available for connecting 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
- Recycled water
- Irrigation
- Pressure sewerage
- Effluent, wastewater, sewerage
- Bore water

2.0 Technical data

2.1 Material properties

The Irontite ductile iron pipeline system 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	7050 kg/m3	
Tensile strength (minimum)	420 N/mm2 for Pipe, 400N/mm2 for Fittings	AS/NZS2280
Elongation (minimum)	DN100 to DN750 10% for Pipe and 10% for Fittings	AS/NZS2280
Ring bending modulus (minimum)	165,000 N/mm2	AS/NZS2566.1
Modulus of Elasticity	170,000 N/mm2	ISO 2531
Hardness (maximum)	230 HB for Pipe and 250HB for Fittings	AS/NZS 2280
Poisson's ratio	0.3	AS/NZS2566.1
Thermal coefficient of linear expansion ductile iron	11.5 x 10-6 m/m/°C	
Thermal coefficient of linear expansion cement mortar lining	12 x 10-6 m/m/°C	

2.2 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 outlines the requirements for ductile iron pressure pipes centrifugally cast and ductile fittings up to DN750 in size.

It classifies pipes based on their allowable operating pressure (AOP) and also includes specifications for flange class pipes, which are used to manufacture pipes with screw-on flanges.

Effect on potable water

Irontite ductile iron pipes and Crevet ductile iron fittings 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.
- Irontite pipes and Crevet ductile iron fittings are manufactured under third party accredited quality assurance programs complying with *ISO 9001 Quality management systems – Requirements.*

Quality System™ Quality Endorsed Company

Certified Product™ Australian Standard

2.3 Classifications

The pipe classification 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 an allowable operating pressure of 3.5MPa (i.e. 35 divided by 10).

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

$$a = p_a k_a y/(2R + p_a k_a) \square \ldots\ldots\ldots\ldots\ldots\ldots Equation\ 1\ and\ shell\ not\ be\ < 3.0mm$$

a is the minimum wall thickness in mm.

P_a is the allowable operating pressure. Excluding surge in MPa.

K_a 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 set out in the Irontite Pipe Dimensions Table 2.3. A special pipe classification, 'Flange Class' for the manufacture of flanged pipe with screw-on flanges is also included.

Flanged pipe classification

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 below Irontite Pipe Dimensions Table 2.3. 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, PN20 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 fitting's classification, refer to the Product Range section of this manual.

2.4 Allowable working pressure for ductile pipes and fittings

The allowable pressures within a pipeline system are limited to the lowest pressure classification of the pipe, fittings, and appurtenances within the system.

Allowable pipeline pressures for class PN35 Irontite pipe with elastomeric seal joints, PN16 or PN35 flanged joints and PN16, PN20 (lightweight) and PN35 ductile iron fittings are shown in Table 2.1.

Table 2.1

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 safely 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.

2.5 Pipe dimensions

Table 2.2

Irontite PN35 cement lined pipes (spigot x socket)				
DN	Approximate pipe mass including socket (kg/m length)	Effective length[1] (m)	Overall length (m)	Allowable joint deflection[2]
		Le	Lo	degrees°
100	18.1	5.5	5.588	3.5
150	27.4	5.5	5.594	3.5
200	33.5	5.5	5.605	3.5
225	37.56	5.5	5.61	3.5
250	42.64	5.5	5.614	3.5
300	57.33	5.5	5.625	2.5
375	82.37	5.5	5.63	2.5
450	109.41	5.5	5.63	2.5
500	130.25	5.5	5.65	2.5
600	176.52	5.5	5.65	2.5
750	271.87	5.5	5.65	1.0

[1] Irontite DI spigot x socket pipes are manufactured with an effective laying length of 5.5m and a tolerance of +/- 30mm.

[2] Refers to angular deflection.

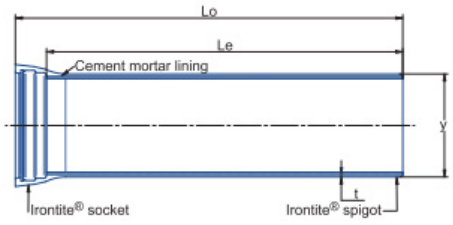
Table 2.3

Irontite pipe dimensions

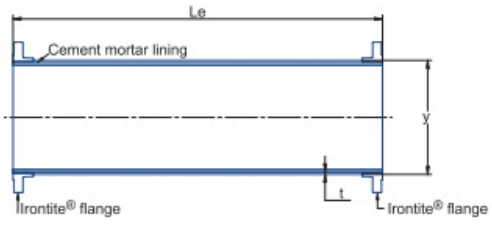
Nominal diameter DN	PN35		Flange class		Mean outside diameter (y) mm	Allowable ovality mm
	Nominal wall thickness (t) mm	Minimum wall thickness (a) mm	Nominal wall thickness (t) mm	Minimum wall thickness (a) mm		
100	4.9	3.5	7.4	6	122 +1, -2	4
150	5	3.5	7.5	6	177 +1, -2	5
200	5	3.5	8.5	7	232 +1, -2	7
225	5	3.5	8.5	7	259 +1, -2	8
250	5.2	3.6	9.6	8	286 +1, -2	9
300	5.9	4.3	9.6	8	345 +1, -2	10
375	7	5.3	10.7	9	426 ± 2	12
450	8.1	6.3	11.8	10	507 ± 2	15
500	8.8	7	11.8	10	560 ± 2	15
600	10.2	8.3	12.9	11	667 ± 2	15
750	12.3	10.2	15.1	13	826 ± 2	15

Note:

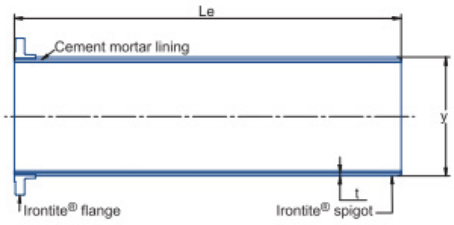
Ovality is the difference between the major and minor axes of the cross section.
Refer to clause 1.6.4 of AS/NZS 2280 for class of flanged pipe.



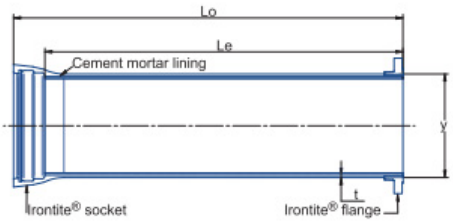
PN35 Irontite DI pipe spigot x socket



Flange class Irontite pipe with flange x flange ends



Flange class Irontite pipe with flange x spigot ends



Flange class Irontite pipe with flange x socket ends

2.6 Standard coatings

Irontite pipe coating

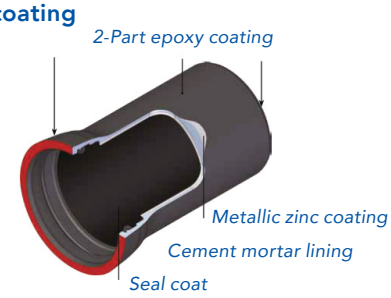
The standard external coating is metallic Zn-Al primer (mean mass 400 gm/m²) + 2-part pore sealing liquid epoxy (min 80 um DFT). The zinc epoxy coating is not in direct contact with drinking water.

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.

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 ductile iron 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 just a barrier protection system, it also provides active protection for the iron shell by providing chemical protection through the phenomenon of passivity.

When the pipe is filled, the mortar gradually absorbs water, which becomes highly alkaline when it reaches the proximity of the metal wall rendering it non-corrosive.

In potable water applications, a seal coating is also applied 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 11.5 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.*

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). Other thermoset coatings are also available upon request.

The coating provides the necessary protection for ductile iron fittings and can be installed without the need for sleeving. Bitumen coated products require sleeving for corrosion protection.

Thermoplastic 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

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

Bitumen coatings - (Nonstandard option for fittings)

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

2.7 Product markings

Marking of ductile iron pipe

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

1. Manufacturer Name (Jindal Saw).
2. Nominal diameter DN.
3. The pipe class PN.
4. The Australian standard the pipe complies with (AS/NZS2280).
5. Colour coding marked on face of pipe socket for pipe class (see below).
6. The words "suitable for cutting" for pipes greater than DN300 as applicable.

Pipe class colour identification

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

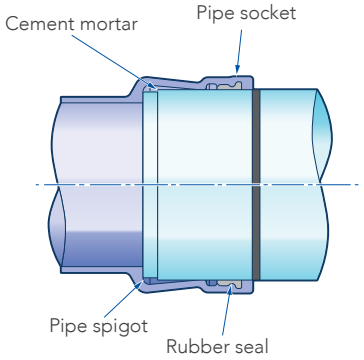
Marking of Crevet ductile iron fittings

Crevet ductile iron fittings are marked with the following for identification and traceability;

1. Manufacturer Name (NIBF)
2. Nominal diameter (DN)
3. DI (Ductile iron)
4. Where applicable the angle of the bend etc
5. Pressure class (PN)
6. The Australian standard that the fitting complies with (AS/NZS 2280)

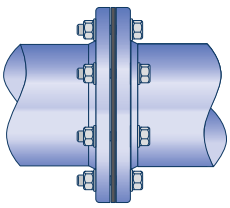
2.8 Pipe joint details

Spigot x socket rubber ring



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 angular deflection. 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 must 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 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. A watertight seal is obtained by tightening the bolts and 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 flanges or 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 comply to the Australian standards.

Note: for rated pressures greater than 1600kPa and up to 3500kPa, PN35 configuration of AS/NZS 4087 must be used which is also compatible with Tables F and H drillings in AS2129.

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, and to ensure a safe design, ring stiffness and embedment design must be considered with the new pipe classifications, along with the allowable pipe ring deflections.

The ring stiffness for each size can be calculated using the formula given in section 2.2 in *AS/NZS2566 Buried Flexible Pipelines Part 1: Structural Design*.

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 must also be able to withstand the loading associated with the proposed ring deflection. Refer to previous table 2.2 "Irontite PN35 cement lined pipes (Spigot x Socket)".

2.9 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.

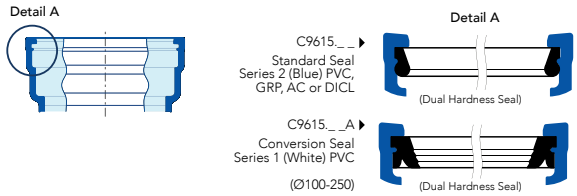
The beveled socket face allows ease of joint assembly during pipeline laying procedures. Deep shouldered seal grooves also help reduce the risk of dislodging the seal during spigot entry.

Standard DI fittings socket details

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

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

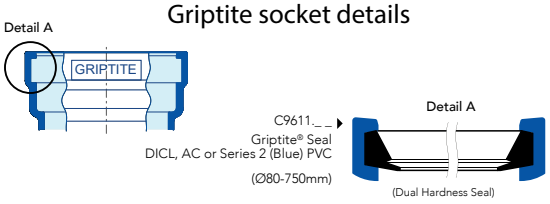
Standard DI socket details



Griptite socket details

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

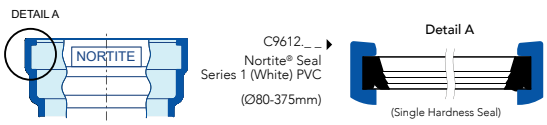
Griptite socket details



Nortite socket details

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

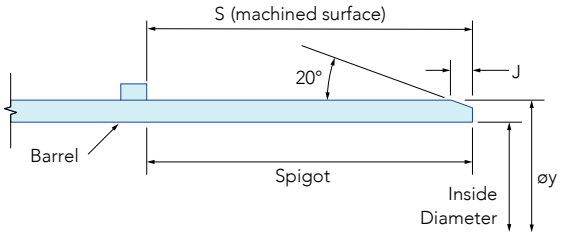
Nortite socket details



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.

Fittings spigot details



Spigots are manufactured in accordance with the dimensional requirements of AS/NZS2280.

Table 2.4

DN	Pipe and fittings		Fittings (ONLY)	
	Mean outside diameter øy (mm)	Allowable ovality (mm)	J (mm)	S (mm)
80	-	-	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

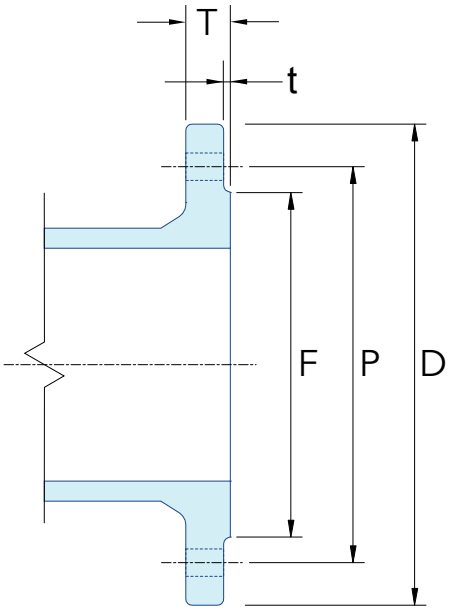
Table 2.5

Flange dimensions and details

Nominal diameter 'DN'	Pressure class 'PN'	Flange outside diameter 'D' (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
100	14 Table E drilling[1]	215	22	178	154	3	8	18	M16
150		280	22	235	211	3	8	22	M20
200		335	25	292	268	3	8	22	M20
225		370	25	324	300	3	12	22	M20
250		405	25	356	328	3	12	22	M20
300		455	29	406	378	4	12	26	M24
375		550	32	495	463	4	12	26	M24
450		640	35	584	552	4	16	26	M24
500		705	38	641	609	4	16	26	M24
600		825	41	756	720	5	16	33	M30
750		995	48	927	888	5	20	36	M33
100	16 Figure B5 AS 4087	215	20	178	154	3	4	18	M16
150		280	23	235	211	3	8	18	M16
200		335	23	292	268	3	8	18	M16
225		370	24	324	300	3	8	18	M16
250		405	24	356	328	3	8	22	M20
300		455	30	406	378	4	12	22	M20
375		550	33	495	463	4	12	26	M24
450		640	33	584	552	4	12	26	M24
500		705	35	641	609	4	16	26	M24
600		825	42	756	720	5	16	30	M27
750		995	47	927	888	5	20	33	M30
100	35 Figure B6 AS 4087	230	22	191	167	3	8	18	M16
150		305	27	260	232	3	12	22	M20
200		370	31	324	296	3	12	22	M20
225		405	35	356	324	3	12	26	M24
250		430	34	381	349	3	12	26	M24
300		490	38	438	406	4	16	26	M24
375		580	42	521	485	4	16	30	M27
450		675	46	610	571	4	20	33	M30
500		735	49	673	634	4	24	33	M30
600		850	54	781	739	5	24	36	M33
750		1015	59	940	898	5	28	36	M33

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

Flange pipe joints



Bolt and gasket requirements

For PN16 Flanges: At a minimum use galvanized carbon steel grade 4.6 or 316 stainless steel grade 50 bolts, nuts, and washers.

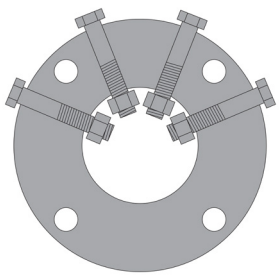
For PN35 Flanges: At a minimum use galvanized carbon steel grade 8.8 or 316 stainless steel grade 70 bolts, nuts, and washers.

Washers: Must be made of the same material as the bolts and nuts.

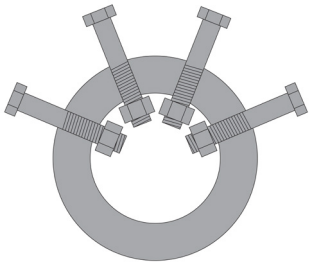
Metal washers of similar material to the fasteners must be used with all ductile iron flanges. Appropriate bolt torques for ductile iron flange fasteners are listed in Table 2.6. These vary depending on the operating and rated pressure of the flange system and values for intermediate pressures may be interpolated.

Solid EPDM gaskets 3mm thick complying with WSA 109 for flanges rated up to PN16 must be used and for flanges rated up to PN35, 1.5mm thick fibre gaskets must be used.

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



Full face kit



Narrow face kit

Table 2.6

Recommended bolt tightening torques [Nm] for ductile iron flanges[1]

DN	PN16[2] GSB, well lubricated	PN16[3] SSB, well lubricated	PN35[2] GSB, well lubricated	PN35[3] SSB, well lubricated
100	50	65	120	160
150	50	65	240	320
200	60	80	240	320
225	60	80	415	550
250	105	140	415	550
300	105	140	415	550
375	180	240	610	810
450	200	265	835	1110
500	200	265	835	1110
600	285	380	1140	1520
750	360	480	1140	1520

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

[2] Well lubricated refers to the application of molybdenum disulphide grease or equivalent anti-seize compound. Galvanized steel bolts [GSB].

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

2.10 Hydraulic design

Hydraulic performance

Iplex has developed the PocketEngineer hydraulic design software to assist the designer select the appropriate pipe diameters. Register at pocketengineer.com.au.

Roughness coefficients

Based on using the Colebrook White Transition equation, the equivalent roughness coefficient 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 other 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.

Note: It is important to ensure an appropriate roughness coefficient is selected for the given circumstance. Selecting a value that is too high or too low can be equally detrimental to the design.

Example: *The choice of pumps (for a pumped main system) 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".

Design

Please refer to Iplex Pocket ENGINEER for hydraulic design information.

Resistance losses in fittings

The flow resistance losses in fittings can be related to the equivalent losses in meters 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:

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

Where

HL = approximate head loss in meters of water

k = Value of Colebrook White roughness 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 "Water Supply Code of Australia" design recommendations can be applied to ductile iron pipes.

The design must ensure that acceptable flow velocities are achieved within the supply network.

Sizing of transfer mains, distribution mains, rising mains and suction mains must be based on a sound compromise between capital and operating costs. Except for ageing cement mortar lined pipes, flow velocities must not exceed 4 m/s under maximum flow conditions unless otherwise specified or approved by the Water Agency.

The Water Agency's advice must be sought when velocities in excess of 3 m/s are being considered on cement mortar lined pipes.

To avoid uneconomical head losses, flow velocities in the reticulation network must not exceed 2.0 m/s for an hour period in any day or as specified by the Water Agency. In special circumstances, such as with flows required for firefighting, velocities up to 4.0 m/s may be acceptable.

The design must ensure adequate minimum velocities for maintaining water quality to the Water Agency requirements, typically assessed at average day demands.

The optimum velocity is typically in the range 0.8 m/s to 1.4 m/s.

The following factors must be considered in determining flow velocity;

a. Water age (travel time through the system)
b. Turbidity
c. Pressure
d. Surge
e. Pumping facilities
f. Pressure reducing devices
g. Pipe lining materials

The total travel time, including retention time within the system (water age) from the last disinfection facility must be less than 72h under all demand conditions (i.e. to maintain chlorine residuals at an effective level).

Note: the information contained in this section must be considered in conjunction with the entire WSA O3 "Water Supply Code of Australia" document.

3.0 Product range

3.1 Irontite ductile iron pipe and sleeving

Standard Irontite

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

Irontite with seal coat

For potable water applications where retention 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 16132. The seal coating is typically for sizes DN100 to DN750.

Optional: Irontite with polyurethane coating

For aggressive conditions where loose polyethylene sleeving is not recommended, and polyurethane coating is required. Polyurethane provides a tough high bond coating system for optimum corrosion protection against aggressive soil environments.

Diameter range

The standard Irontite pipe range is from DN100 to DN750. Where larger diameters are required contact Iplex.

DICL pipe typically used for potable water applications is Irontite Blue PN35. Irontite Blue's range is from DN100 to DN750 and has a cement mortar and bituminous seal coat lining and an external coating of Zn-Al primer + blue liquid epoxy.

Spigot x socket rubber ring joint Irontite BLUE PN35 ductile iron pipe

Product code	Description 1	Description 2	Joint type
C3011.0100SC	DN100 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0150SC	DN150 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0200SC	DN200 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0225SC	DN225 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0250SC	DN250 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0300SC	DN300 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0375SC	DN375 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0450SC	DN450 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0500SC	DN500 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0600SC	DN600 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ
C3011.0750SC	DN750 PN35 DI Irontite Blue Pipe	x 5.5m effective length CL Seal Coat	Spigot x Socket (Push on) RRJ

Spigot x socket rubber ring joint Irontite RED PN35 ductile iron pipe

DICL pipe typically used for gravity sewer applications is Irontite Red PN35. Irontite Red's range is from DN100 to DN750, it has calcium aluminate cement lining and an external coating of Zn-Al primer + red liquid epoxy.

Product code	Description 1	Description 2	Joint type
C3012.0100	DN100 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0150	DN150 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0200	DN200 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0225	DN225 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0250	DN250 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0300	DN300 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0375	DN375 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0450	DN450 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0500	DN500 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0600	DN600 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ
C3012.0750	DN750 PN35 DI Irontite Red Pipe	x 5.5m effective length CA lined	Spigot x Socket (Push on) RRJ

'Flange Class' ductile iron pipe

Irontite DI flange class spigot x socket pipes are manufactured with an effective laying length of 5.5m. Standard length tolerance is ±30mm.

Irontite flanged pipes are available in nominal maximum lengths of up to 5.35m*. 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

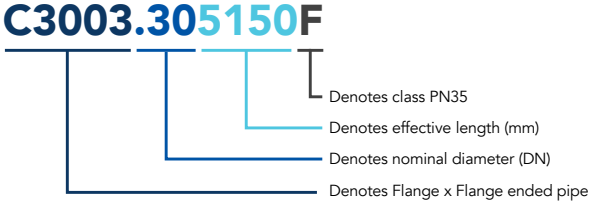
***Note: The length limited imposed by AS/NZS 2280 is 5350mm. However, the Irontite manufacturing process allows longer lengths (up to 5500mm) for flange class pipe, which does not comply with the length limited imposed by this standard.**

Product code examples

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

C3003.305150

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	xxxx mm effective length CL[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 above.

For PN35 flanges add 'F' at the end of the product code as shown in example above.

Flange x spigot PN16 and PN35 Irontite ductile iron 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 above.

For PN35 flanges add 'F' at the end of the product code as shown in example above.

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 on page 17.

Spigot x socket PN35 Irontite

Base product code[1]	Description 1	Description 2[2]	Spigot x socket
C3006.10□□□□□F	DN100 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.15□□□□□F	DN150 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.20□□□□□F	DN200 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.22□□□□□F	DN225 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.25□□□□□F	DN250 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.30□□□□□F	DN300 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.37□□□□□F	DN375 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.45□□□□□F	DN450 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.50□□□□□F	DN500 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.60□□□□□F	DN600 PN35 DI Irontite Pipe	XXXX mm effective length CL	Spigot x Spigot
C3006.75□□□□□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 on page 17.

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 on page 17.

For PN35 flanges add 'F' at the end of the product code as shown in the example on page 17.

Irontite sleeving

Base product code	Description 1	Description 2
Blue Sleeving - Potable 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
C30921.22LFW	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

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

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

Features and benefits

- Environmental benefits – through use of less energy and materials.
- Light weight – providing benefits in manual handling and installation.
- Compact design – providing benefits in packaging and handling.
- Deep sockets – suitable for use across a wide range of pipe systems including PVC-O, PVC-M, PVC-U, GRP and Ductile Iron.
- Compatible – can be used for Series 1 and Series 2 PVC pipe systems.
- Economical – cost efficient use of materials.
- Corrosion protection – fittings are supplied with Plascoat PPA 571 protective coating.

Compliance

Crevet SL® fittings are manufactured in accordance with the relevant Australian Standards set out below.

Certification – Product Certification StandardsMark SMK0950.

Standards

- *AS/NZS 2280 Ductile Iron Pressure Pipe and Fittings.*
- *AS/NZS 4158 Thermal Bonded Polymeric Coatings on Valves and 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 and Risers	16	1.60	1.92	2.00
Socketed bends, Socketed tees and Connectors	20	2.00	2.40	2.50

Fittings socket design

	Minimum socket depth (mm)		
Size DN (mm)	AS/NZS 2280 and 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.

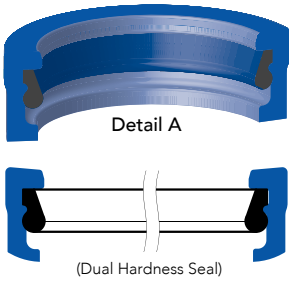
[1] With adaptor seal.

Seals

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

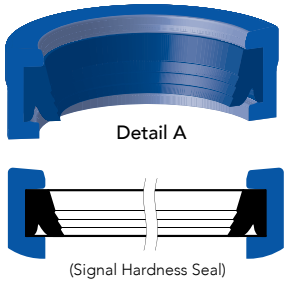
Series 2 PVC-O, PVC-M, PVC-U, GRP, and ductile iron fittings seal configurations.

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



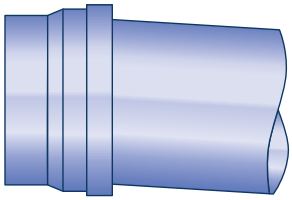
Series 1 PVC-M, PVC-U, and ductile iron fittings seal configuration.

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



Deflection

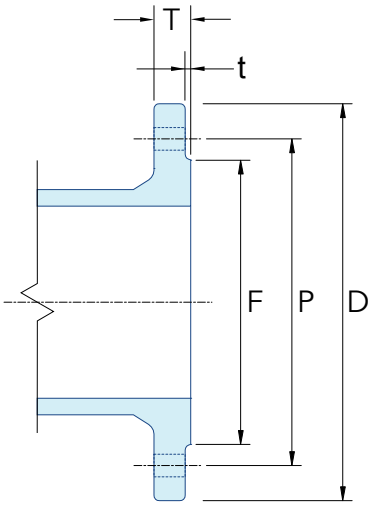
DN (mm)	Fittings maximum deflection (Degrees)
100	3.5
150	3.5
200	3.5
225	3.5
250	3.5
300	2.5



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

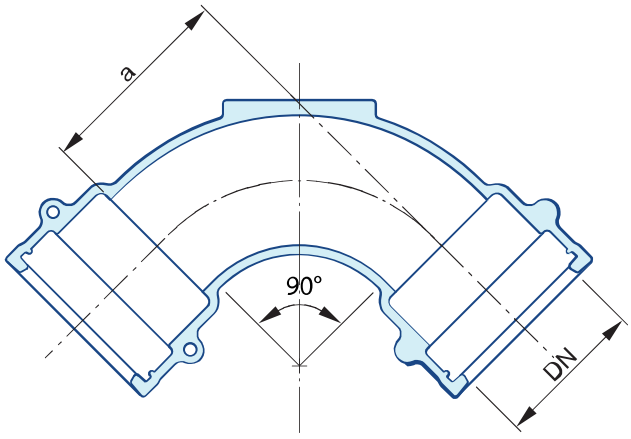


3.3 Bends

Socket Bends 90°

DN	Product codes		Dim. (mm) a
	Series 2 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.



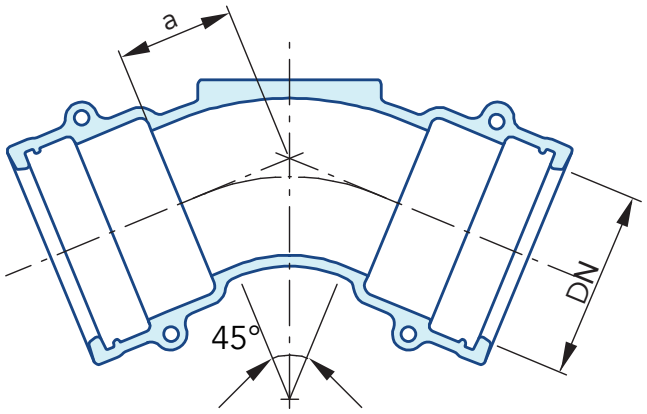
Product specification

Application: Used for deflection of a pipeline.

Socket Bends 45°

DN	Product codes		Dim. (mm) a
	Series 2 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

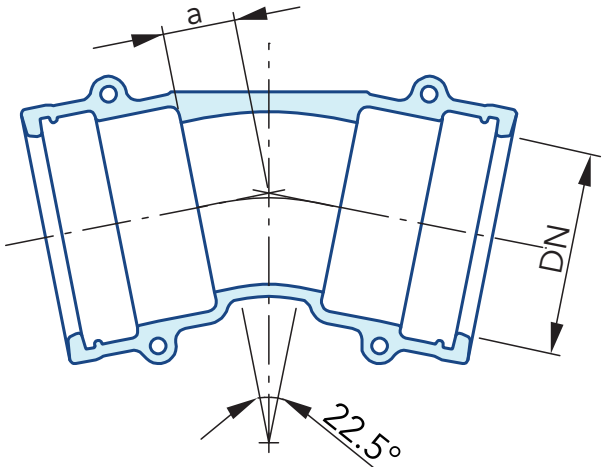
[1] Crevet SL® Series 2 fittings are rated at PN20.
[2] Series 1 fittings fitted with adaptor seal are rated at PN12.



Socket Bends 22½°

DN	Product codes		Dim. (mm) a
	Series 2 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).

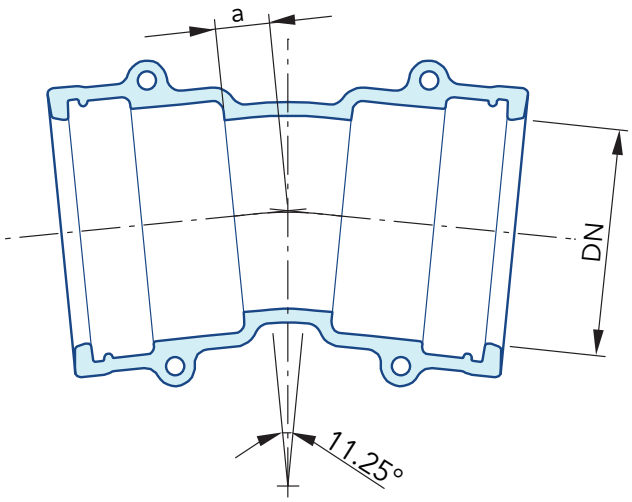
Note:

1. **All dimensions are in accordance with AS/NZS 2280, where applicable.**
2. **DN100and DN150 Socket fittings in PN35 are made to order only. Contact Iplex 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 of the bore or outside diameter of the end connections (in millimeters).**

Socket Bends 11¼°

DN	Product codes		Dim. (mm) a
	Series 2 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.

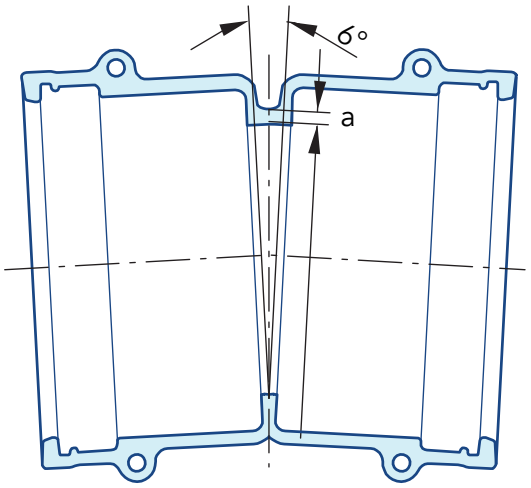


Product specification

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).

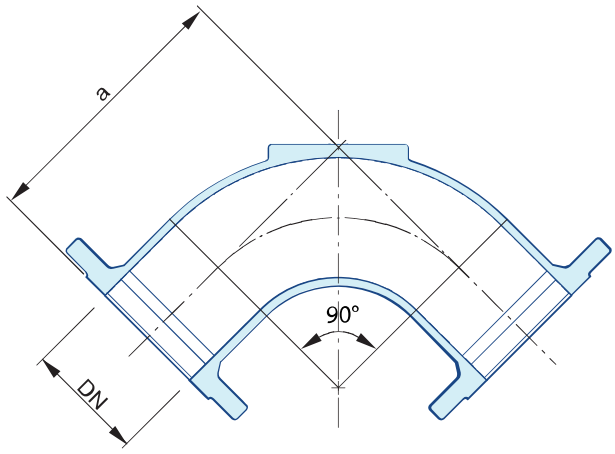
Socket Bends 6°

DN	Product code Crevet SL® Series 2 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



Product specification

Applications: Used for deflection of a pipeline.

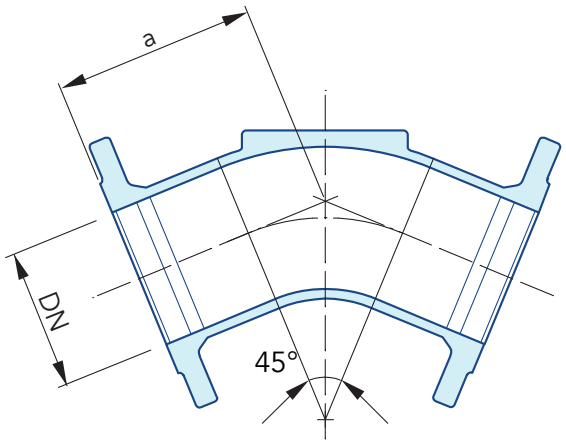
* For DN80 Flanged PN16 Dim. (mm) a = 141.

Note:

1. **Bends with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
2. **All dimensions are in accordance with AS/NZS 2280, where applicable.**
3. **DN100 and 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 of the bore or outside diameter of the end connections (in millimeters).**

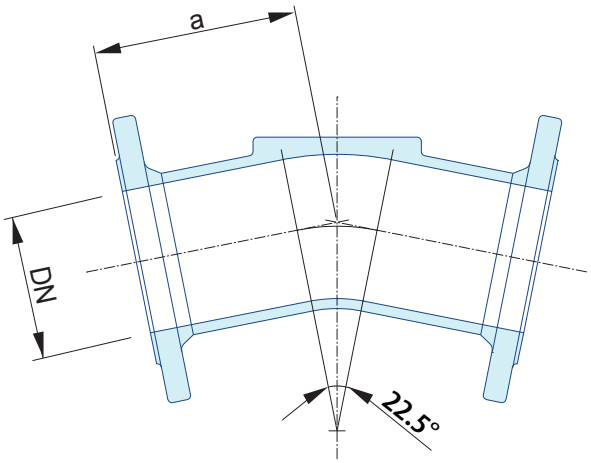
Flange Bends 45°

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



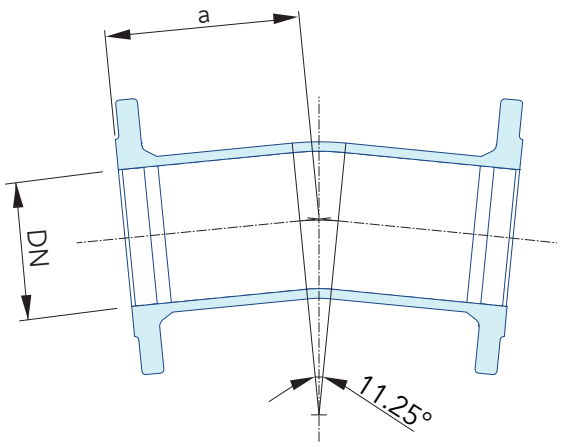
Flange Bends 22½°

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

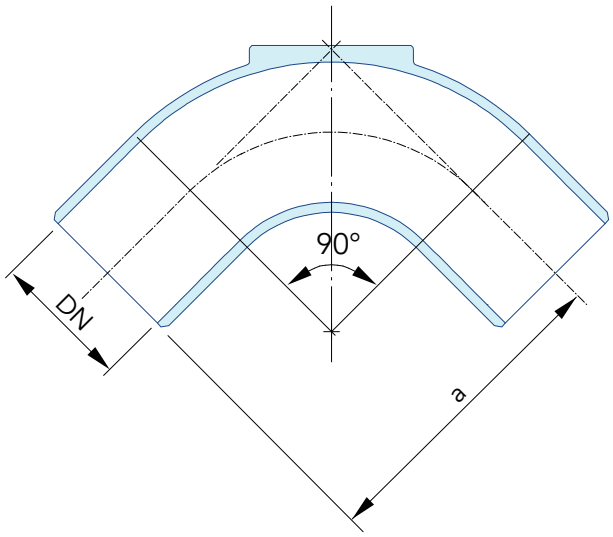


Note:

1. **Bends with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

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

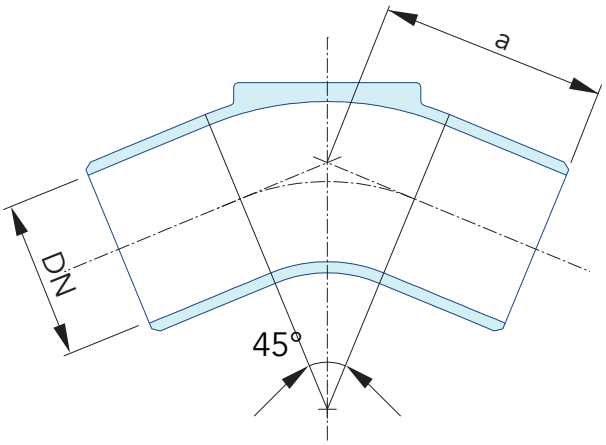


Product specification

Applications: Used for deflection of a pipeline.

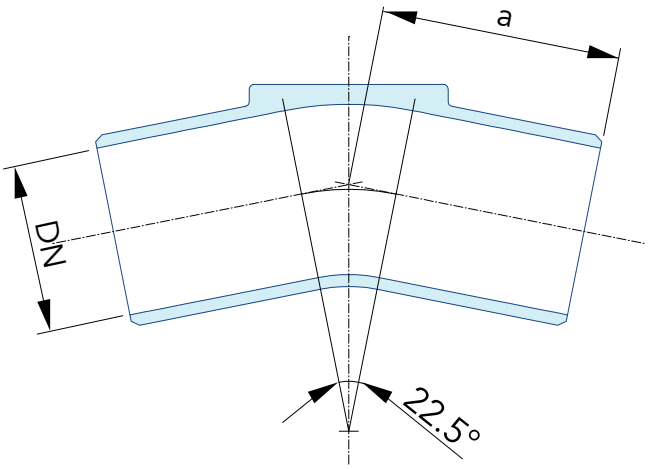
Spigot Bends 45°

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



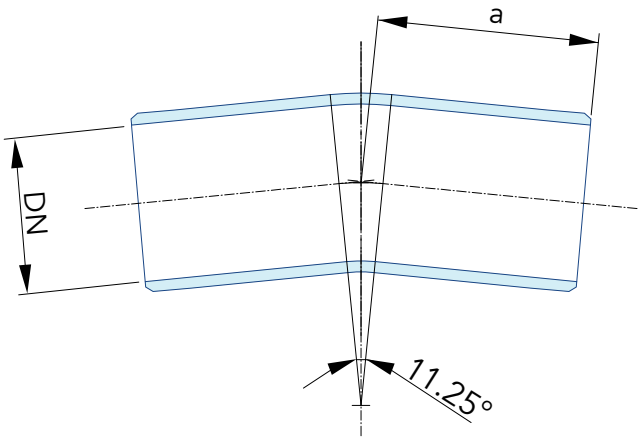
Spigot Bends 22½°

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:

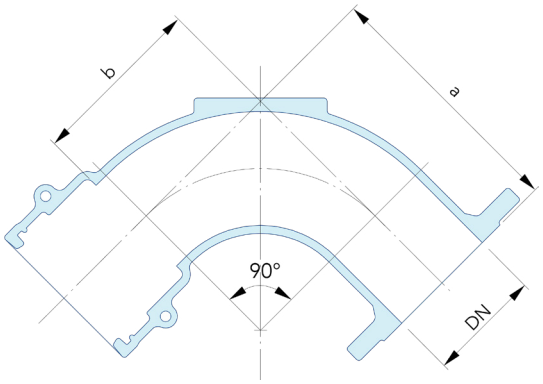
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size of the bore or outside diameter of the end connections (in millimeters).

Socket - Flange Bends 90°

DN	Product codes		Dim. (mm) a	Dim. (mm) b
	Series 2 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

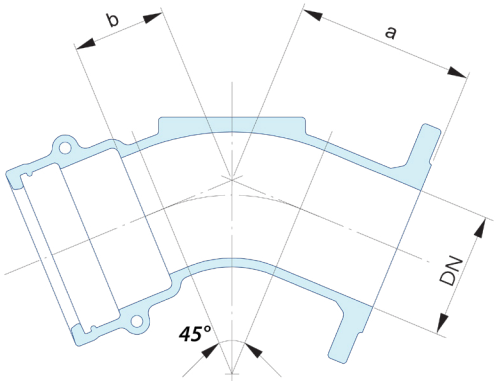
Application: Used for deflection of a pipeline.

Flanges: PN16 to AS4087.

Socket - Flange Bends 45°

DN	Product codes		Dim. (mm) a	Dim. (mm) b
	Series 2 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.

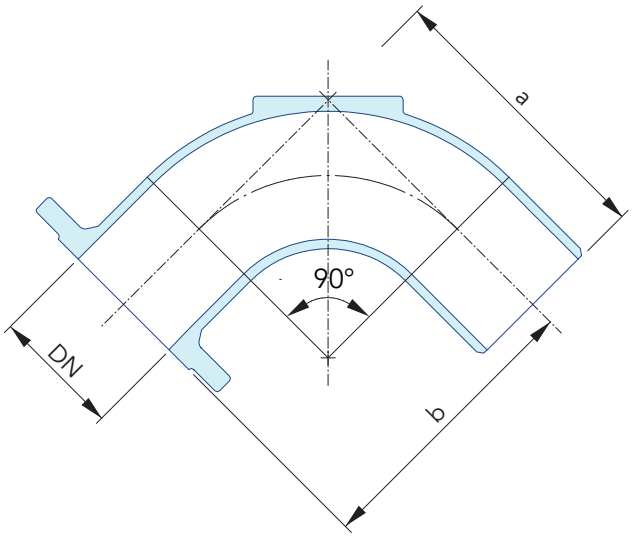
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:

1. **Bends with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

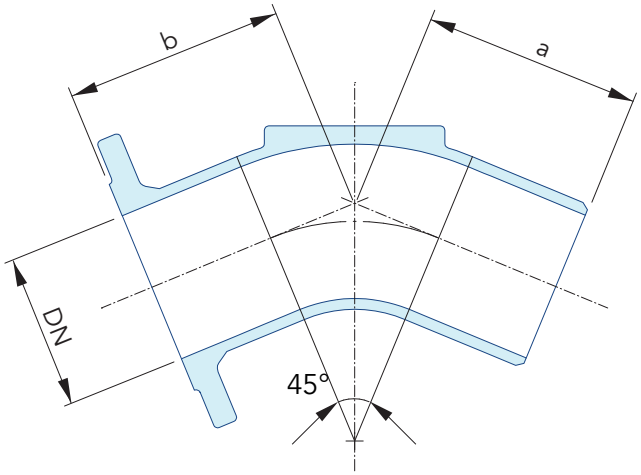
Flange - Spigot Bends 90°

DN	Product code 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



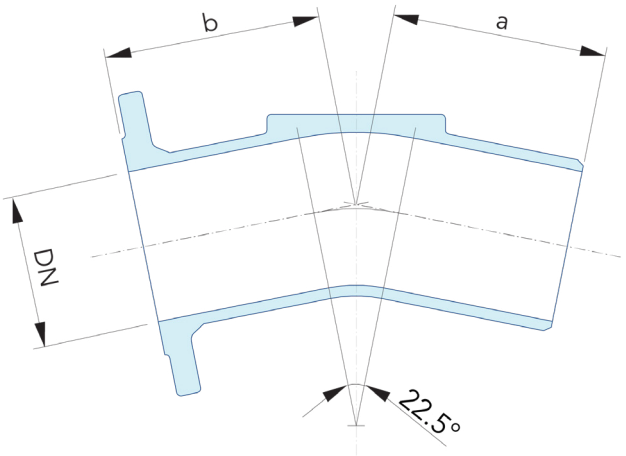
Flange - Spigot Bends 45°

DN	Product code 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



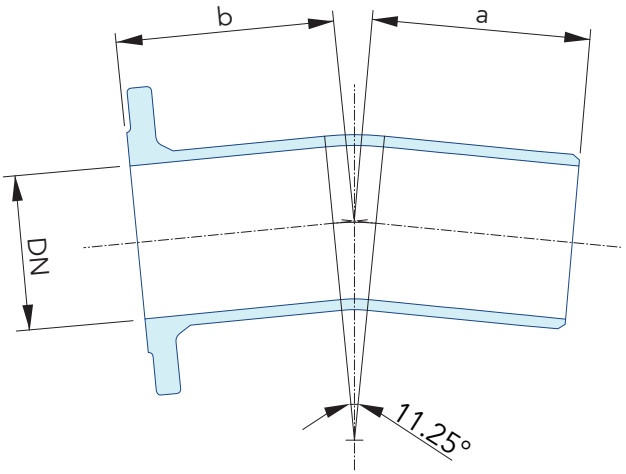
Flange - Spigot Bends 22½°

DN	Product code 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 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. To denote these flanges, the letter 'F' is added to the end of the product code.
2. Bends with Table E flanges to AS2129 are also available on request with suffix 'E' added to the product code.
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 millimeters, 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 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

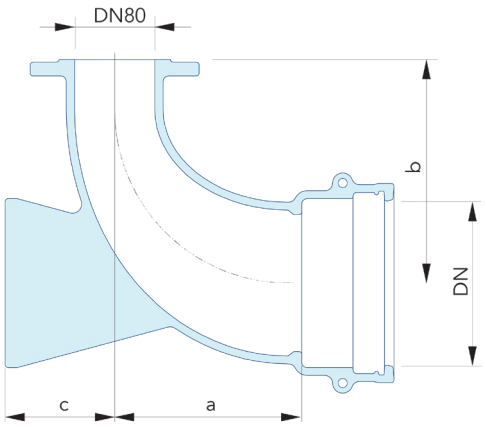
[1] Crevet SL® fittings.

[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

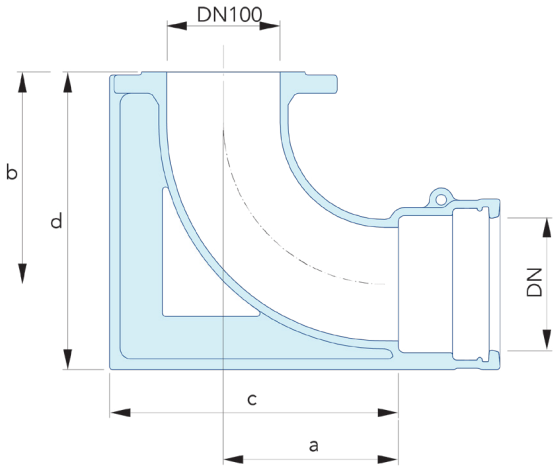
DN	Product Code Series 2 PN16	Dim. (mm) a	Dim. (mm) b	Dim. (mm) c	Dim. (mm) d
100	C121.101090S[1]	75	157.5	76.5	-
100	C121.101090	75	195	380	280
150	C121.151090S[1]	102	195.5	81.5	-
150	C121.151090	102	213	280	320

[1] Crevet SL® fittings.

Product specification

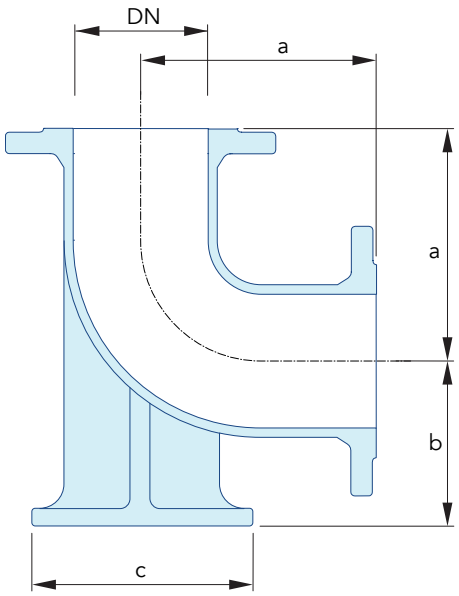
Applications: Used at the end of a line for hydrant.

DN100 Flange: PN16 AS/NS4087.



Flange Duckfoot Bends

DN	Product code PN16 flange	Dim. (mm) a	Dim. (mm) b	Dim. (mm) c
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

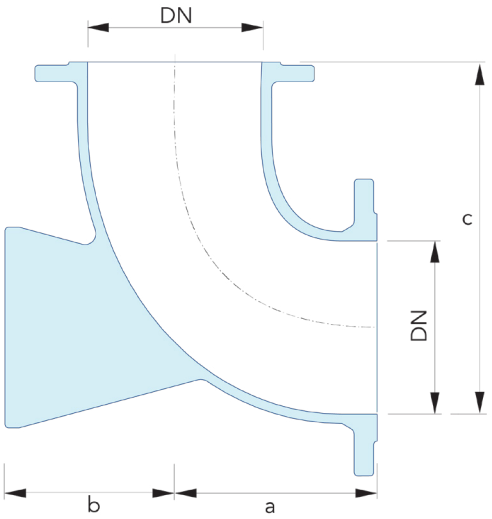


Product specification

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. To denote these flanges, the letter 'F' is added to the end of the product code. 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 of the bore or outside diameter of the end connections (in millimeters).**

3.4 Tees

Socket tees - DI and series 2 PVC

DN	dn	Product code series 2 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

Socket tees - DI and series 2 PVC continued

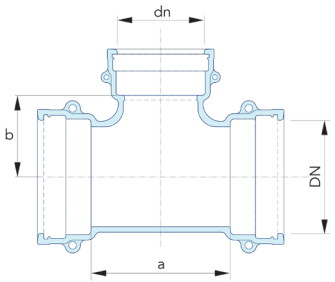
DN	dn	Product code series 2 PN35	Dim. (mm) a	Dim. (mm) b
450	300	C031.4530	500	325
450	375	C031.4537	610	345
450	450	C031.4545	690	345
500	100	C031.5010	420	340
500	250	C031.5025	420	340
500	300	C031.5030	500	355
500	375	C031.5037	610	370
500	450	C031.5045	690	370
500	500	C031.5050	770	385
600	100	C031.6010	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:

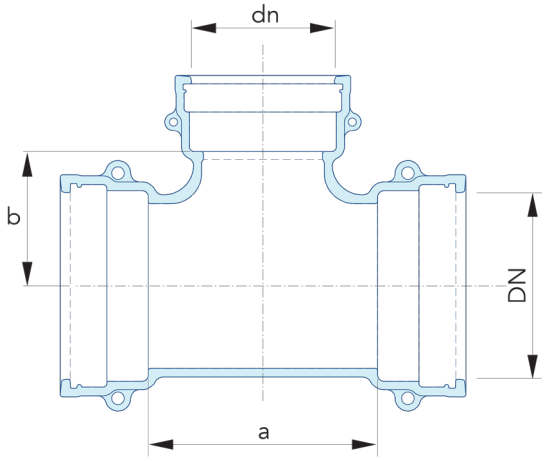
1. **Standard range DN100 and DN150 DI socket fittings in PN35 are made to order only.**
2. **All dimensions are in accordance with AS/NZS 2280, where applicable.**
3. **DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical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

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 of the bore or outside diameter of the end connections (in millimeters).**

Socket - flanged tees

DN	dn	Product codes			Dim. (mm) a	Dim. (mm) b
		Series 2 PN16	Series 2 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

Socket - flanged tees continued

DN	dn	Product codes			Dim. (mm) a	Dim. (mm) b
		Series 2 PN16	Series 2 PN35	Series 1[1] PN16		
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

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

Note:

1. **Socket - Flange tee with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code. Other flange configurations are also available on request.**
2. **Standard range DN100 and 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 of the bore or outside diameter of the end connections (in millimeters).**

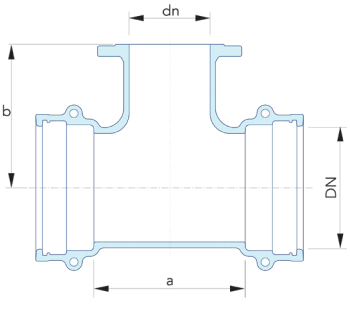
Product specification

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 147.

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 - flange hydrant tees

DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		Series 2 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.

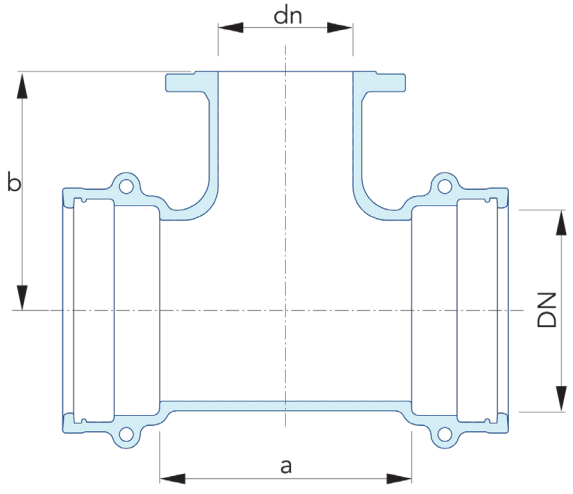
[2] Crevet SL® fittings.

Product specification

Applications: Used for hydrant take offs.

DN Flanges: PN16 AS/NZS 4087.

WA Hydrant tees have a 100mm dia flanged offtake.

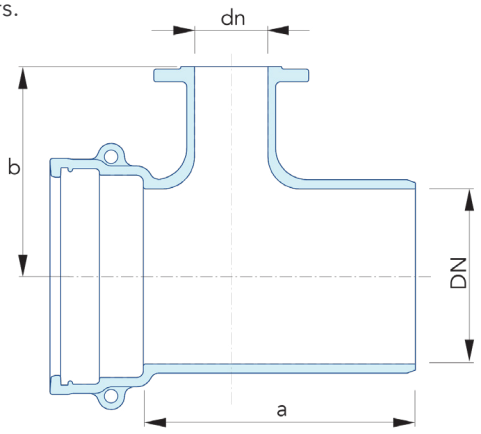


Socket - spigot - flange hydrant tees

DN	dn	Product code Series 2 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

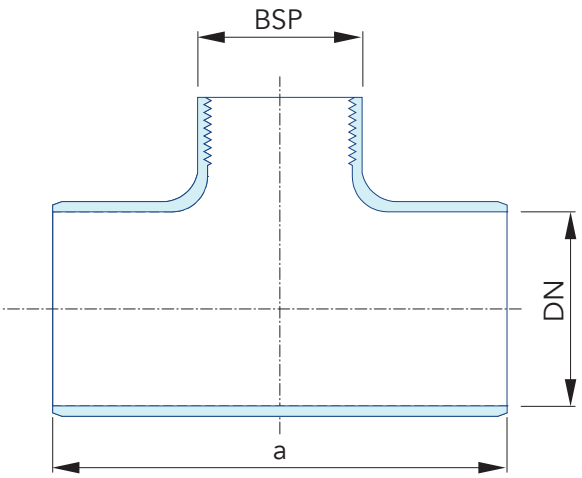
Product specification

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	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 are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Other flange configurations are also available on request.**
2. **For hydrants with a DN100 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 of the bore or outside diameter of the end connections (in millimeters).**

Spigot tees

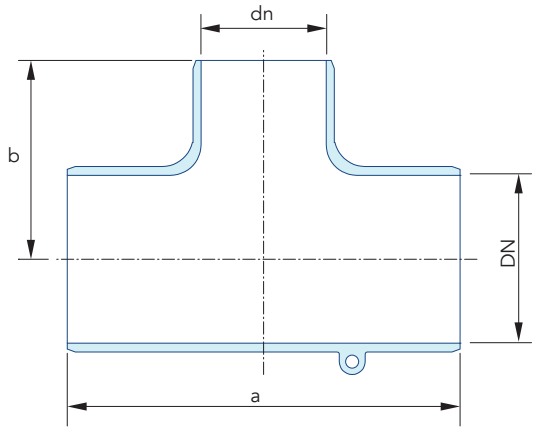
DN	dn	Product code PN35	Dim. (mm) a	Dim. (mm) b
80	80	C034.0808	330	168
100	80	C034.1008	380	190
100	100	C034.1010	380	190
150	80	C034.1508	432	216
150	100	C034.1510	432	216
150	150	C034.1515	432	216
200	100	C034.2010	482	241
200	150	C034.2015	482	241
200	200	C034.2020	534	254
225	80	C034.2208	508	254
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

Spigot tees continued

DN	dn	Product code PN35	Dim. (mm) a	Dim. (mm) b
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

Spigot tees continued

DN	dn	Product code PN35	Dim. (mm) a	Dim. (mm) b
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 of the bore or outside diameter of the end connections (in millimeters).**

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

Flange tees continued

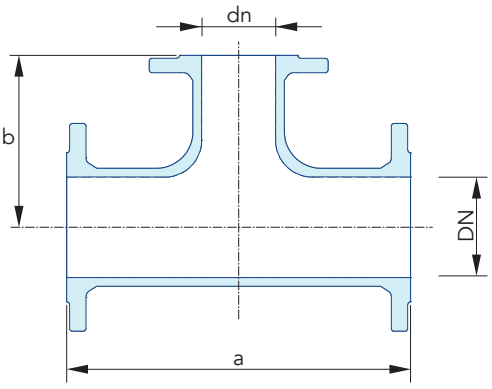
DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		Flanged PN16	Flanged PN35		
225	225	C033.2222	C033.2222F	508	254
250	80	C033.2508	C033.2508F	534	267
250	100	C033.2510	C033.2510F	534	267
250	150	C033.2515	C033.2515F	534	267
250	200	C033.2520	C033.2520F	534	267
250	225	C033.2522	C033.2522F	534	267
250	250	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

Flange tees continued

DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		Flanged PN16	Flanged PN35		
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 and dn flanges: PN16 AS/NZS 4087, PN35 AS/NZS 4087.
Installation: Guidelines for Flanged Joints can be found on page 147.



Note:

1. **Flanged tees with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code. 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 of the bore or outside diameter of the end connections (in millimeters).**

Spigot - flange tees

DN	dn	Product code 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

Spigot - flange tees continued

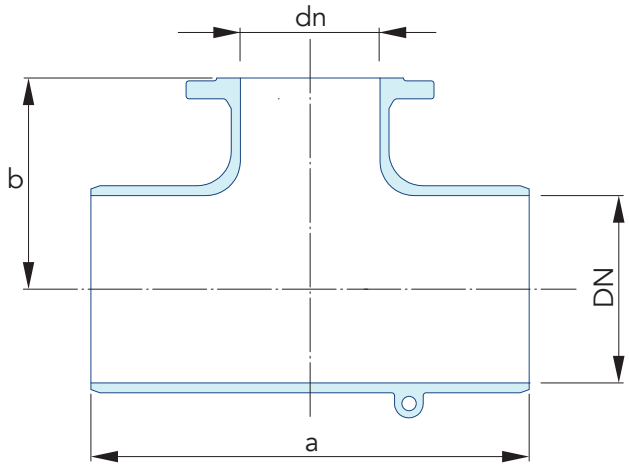
DN	dn	Product code PN16	Dim. (mm) a	Dim. (mm) b
300	300	C0343.3030	660	305
375	80	C0343.3708	559	309
375	100	C0343.3710	712	343
375	150	C0343.3715	712	343
375	200	C0343.3720	736	356
375	225	C0343.3722	736	356
375	250	C0343.3725	736	356
375	300	C0343.3730	736	356
375	375	C0343.3737	812	368
450	80	C0343.4508	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

Spigot - flange tees continued

DN	dn	Product code PN16	Dim. (mm) a	Dim. (mm) b
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

Note:

1. **Spigot - Flange tees with AS/NZS 4087 PN35 flanges are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**



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 147.

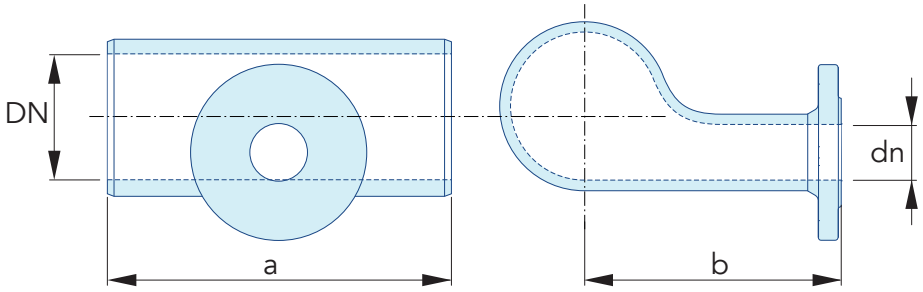
Spigot - flange scour tees

DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		PN16	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.



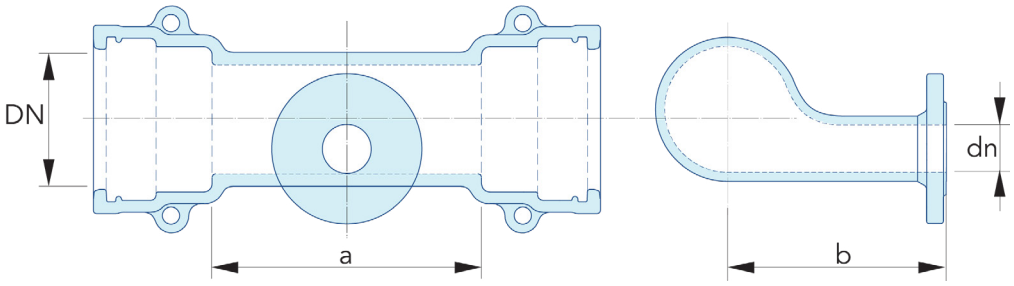
Socket - flange scour tees series 2

DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		Series 2 PN16	Series 2 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.

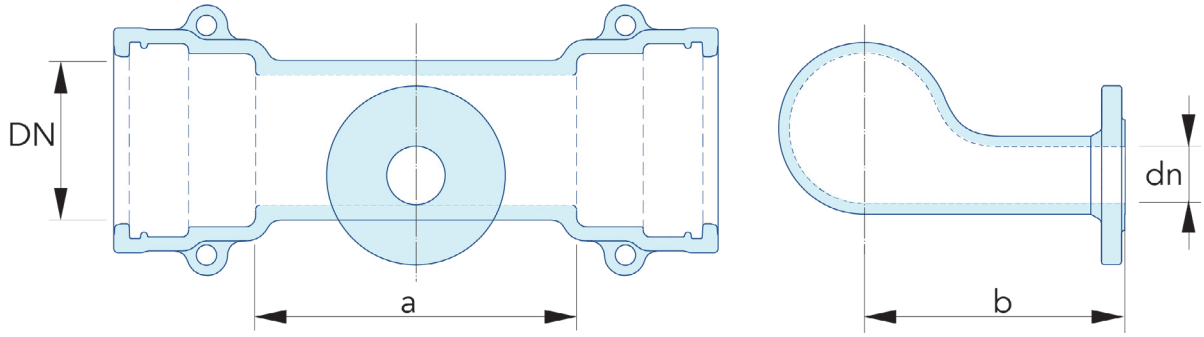
dn Flanges: PN16 AS/NZS 4087, PN35 AS/NZS 4087.



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.

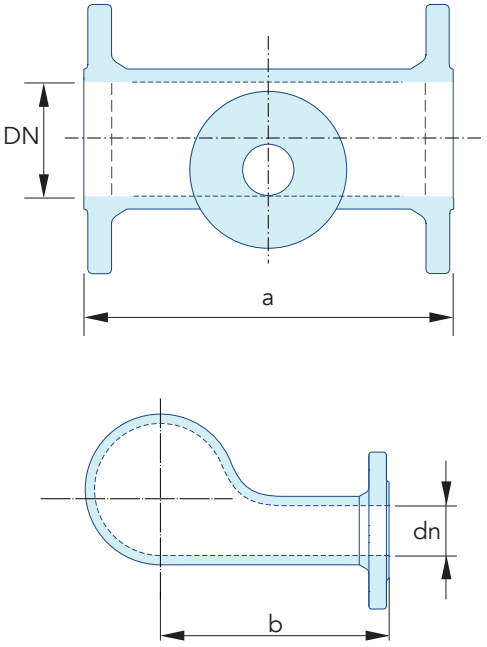
dn Flanges: PN16 AS/NZS 4087, PN35 AS/NZS 4087.

Note:

1. **Scour tees with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

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	452	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	375
450	100	C043.4510	C043.4510F	558	381
450	150	C043.4515	C043.4515F	548	415
500	150	C043.5015	C043.5015F	572	440
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



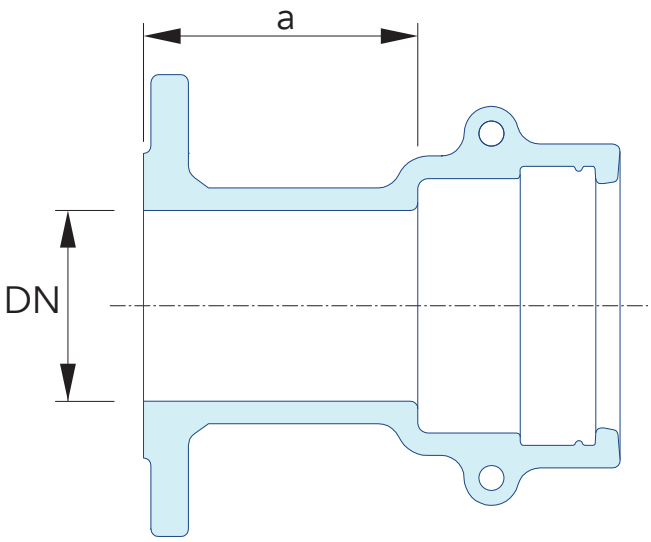
Product specification

DN and dn Flanges: PN16 AS/NZS 4087, PN35 AS/NZS 4087.

3.5 Connectors and pre-taps

Flange - socket connectors

DN	Product codes			Dim. (mm) a
	Series 2 PN16	Series 2 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.

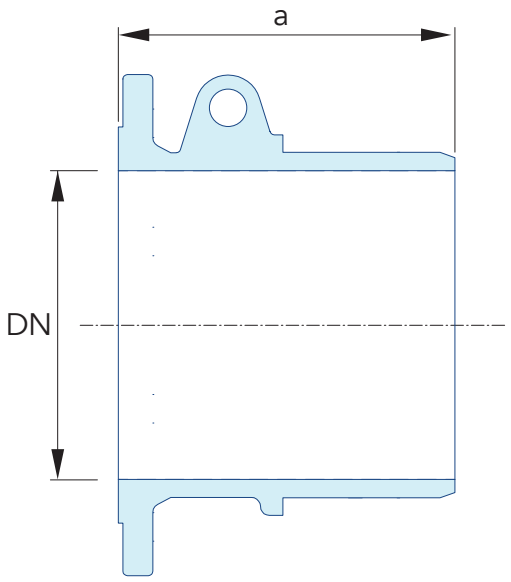
Adaptor seals: Adaptor/conversion seals are available for converting Series 2 DI fittings (suitable for use with blue PVC pipe) to Series 1 DI fittings (suitable for use with white PVC pipe).

Note:

1. **Fittings with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

Flange - spigot connectors

DN	Product code PN16	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 and socket slip couplings

DN	Product codes					
	Connector series 2	Connector series 1[2]	Adaptor series 1 to series 2	Pretap connector 4 tap series 2	Pretap connector 2 tap series 2	Socket slip coupling series 2
80	C101.08	C102.08	C1012.08	-	-	-
100	C101.10S[1]	C102.10S[1]	-	-	C1011.10020VSBT	-
100	C101.10	C102.10	C1012.10	C1011.10020SBT C1011.10025SBT	C1011.10020VPSBT	C150.10S
150	C101.15S[1]	C102.15S[1]	-	-	C1011.15020VSBT	-
150	C101.15	C102.15	C1012.15	C1011.15020SBT C1011.15025SBT	C1011.15020VPSBT	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	-	-	-	-	-

Note: All pretap connectors are PN16 rated.

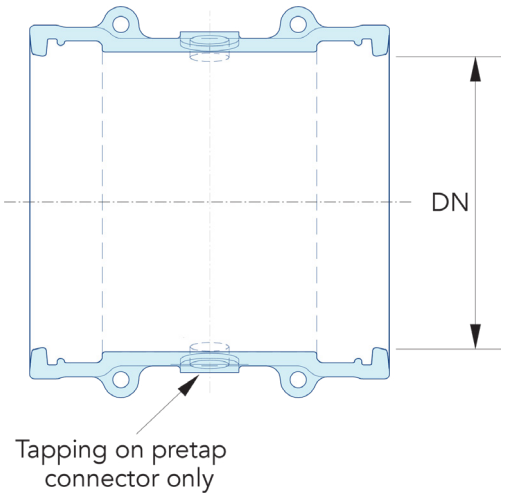
[1] Crevet SL® fittings are rated at PN20.

[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).

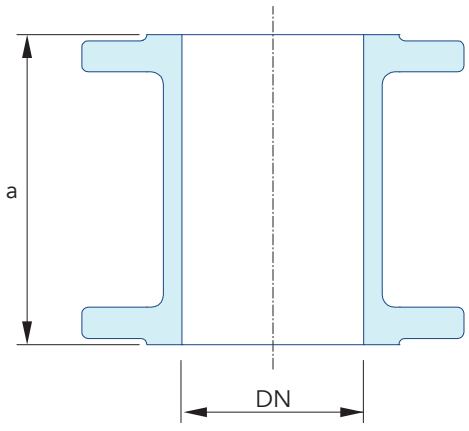
Note:

1. **Pretap Connectors come standard with polymeric coatings (e.g. C1011.1020 (20mm) and C1011.1025 (25mm) configurations). Other tapping's are available on request. Pretap connectors have two tapping's (AS 1722.1 RP) 150° apart.**
2. **Flanged fittings with AS/NZS 4087 PN35 flanges are available on request. To denote these flanges, the letter 'F' is added to the end of the product code.**
3. **Flanged fittings with Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**



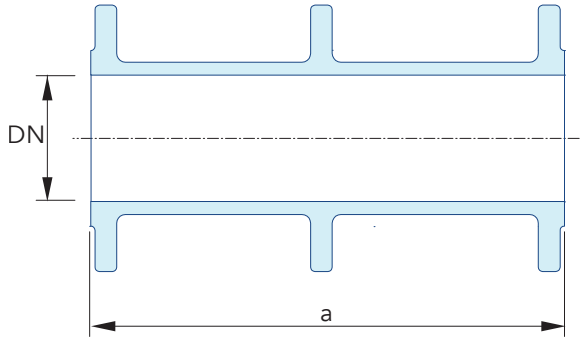
Hydrant risers

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



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

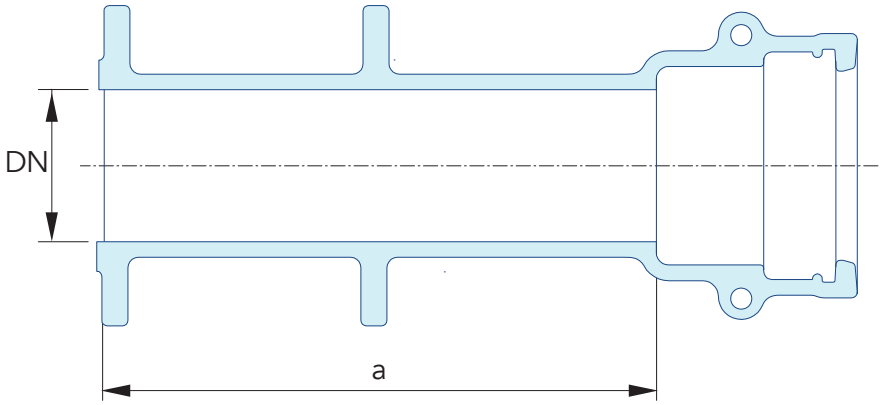


Product specification

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

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. To denote these flanges, the letter 'F' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

3.6 Tapers

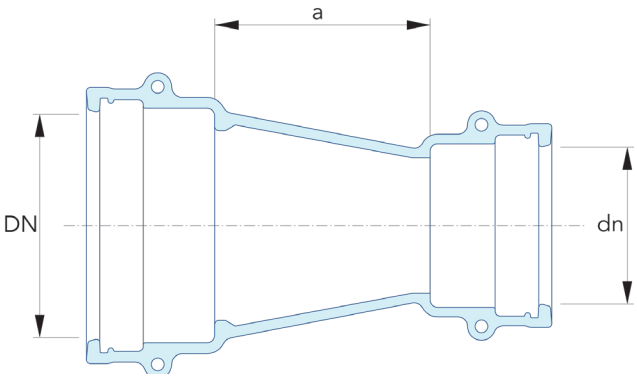
Socket tapers

DN	dn	Product codes		Dim. (mm) a
		Series 2 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

Socket tapers continued

DN	dn	Product codes		Dim. (mm) a
		Series 2 PN35	Series 1[1] PN16	
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.

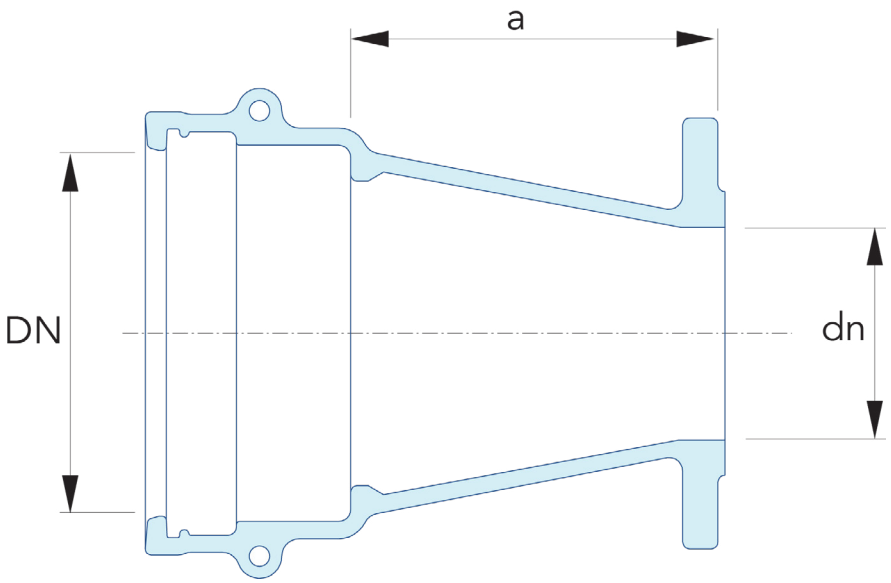
Socket - flange tapers

DN	dn	Product codes			Dim. (mm) a
		Series 2 PN16	Series 2 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

Socket - flange tapers continued

DN	dn	Product codes			Dim. (mm) a
		Series 2 PN16	Series 2 PN35	Series 1[1] PN16	
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 are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

Flange tapers

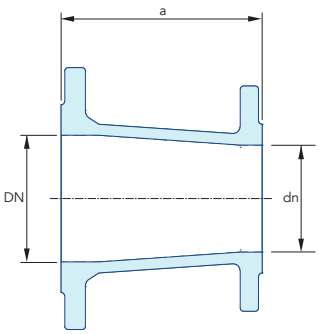
DN	dn	Product codes			Dim. (mm) a
		Concentric PN16	Concentric PN35	Eccentric PN16	
80	50	C063.0805	CC063.0805F	-	170
80	58	-	-	C073.08058	152
100	50	C063.1005	C063.1005F	C073.1005	178
100	58	C063.10058	C063.10058F	-	230
100	65	C063.1006	C063.1006F	C073.1006	169
100	80	C063.1008	C063.1008F	C073.1008	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

Flange tapers continued

DN	dn	Product codes			Dim. (mm) a
		Concentric PN16	Concentric PN35	Eccentric PN16	
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

Note:

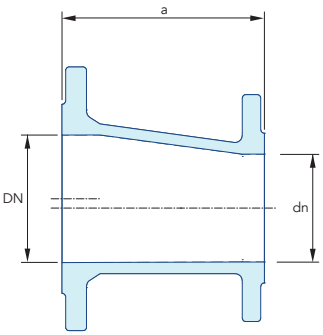
1. **Flanged tapers with AS/NZS 4087 PN35 flanges are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
2. **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 of the bore or outside diameter of the end connections (in millimeters).**



Concentric

Product specification

Application:
Used to reduce a pipeline.



Eccentric

Product specification

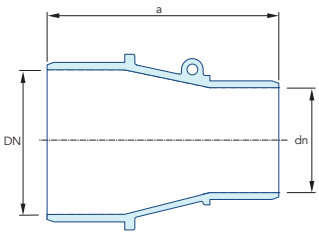
Application:
Used to reduce a pipeline in gravity sewer applications.

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

Spigot tapers continued

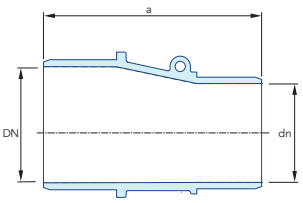
DN	dn	Product codes		Dim. (mm) a
		Concentric PN35	Eccentric PN35	
450	375	C064.4537	C074.4537	470
525	150	C064.5215	C074.5215	1131
525	200	C064.5220	C074.5220	1080
525	225	C064.5222	C074.5222	1016
525	250	C064.5225	C074.5225	952
525	300	C064.5230	C074.5230	826
525	375	C064.5237	C074.5237	661
525	450	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:

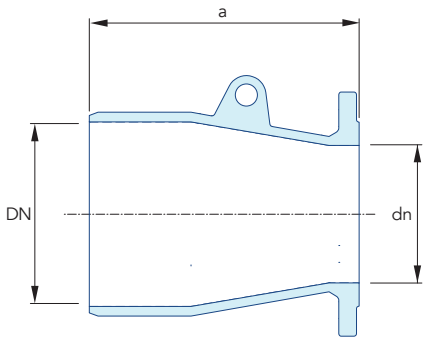
1. All dimensions are in accordance with AS/NZS 2280, where applicable.
2. DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size of the bore or outside diameter of the end connections (in millimeters).

Spigot - flange tapers

DN	dn	Product code 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

Spigot - flange tapers continued

DN	dn	Product code PN16	Dim. (mm) a
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:

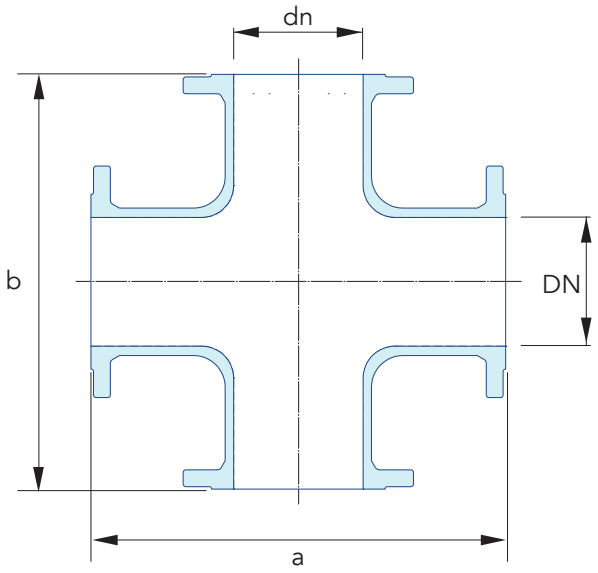
1. **Tapers with AS/NZS 4087 PN35 flanges are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
2. **All dimensions 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 of the bore or outside diameter of the end connections (in millimeters).**

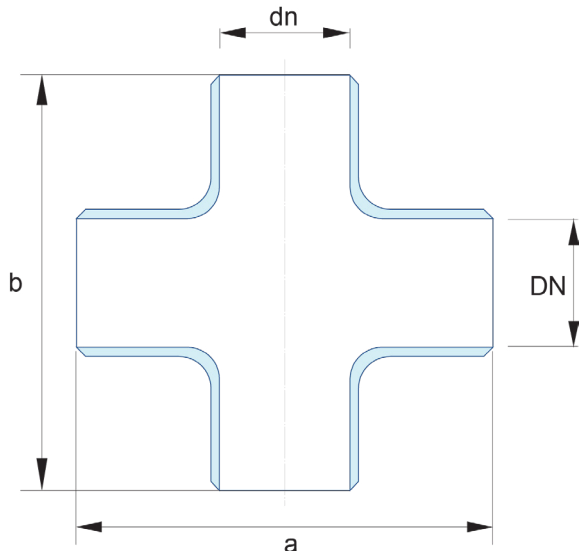
3.7 Crosses

Crosses					
DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		Flanged Cross PN16	Spigot Cross 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

Crosses continued

DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b
		Flanged Cross PN16	Spigot Cross PN16		
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 and dn Flanges: PN16 AS/NZS 4087.

Note:

1. **Flanged Crosses with AS/NZS 4087 PN35 flanges are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

3.8 Wyes

Flange and spigot wyes

DN	dn	Flanged Wye PN16			Spigoted Wye PN35			Spigot-Flange Wye 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	150	C093.3715	828	688						
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	-	-	-	-	-	-	-	-

Flange and spigot wyes continued

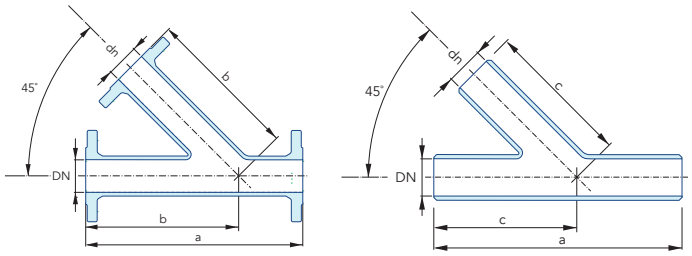
DN	dn	Flanged Wye PN16			Spigoted Wye PN35			Spigot-Flange Wye PN16		
		Product code	Dim. (mm) a	Dim. (mm) b	Product code	Dim. (mm) a	Dim. (mm) c	Product code	Dim. (mm) a	Dim. (mm) c
450	450	C093.4545	1128	895	C094.4545	1185	930	C0943.4545	1185	895
600	450	C093.6045	1397	1167	-	-	-	-	-	-
600	600	C093.6060	1488	1167	C094.6060	1494	1170	C0943.6060	1494	1167

Product specification

Application: Used for branching off a pipeline.

DN and dn Flanges: PN16 AS/NZS 4087.

AS/NZS 4087 PN35 flanges are available on request. To denote these flanges, the letter 'F' is added to the end of the product code. Table E flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.



Socket wyes

DN	dn	Product codes		Dim. (mm) a	Dim. (mm) b	Dim. (mm) c
		Series 2 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

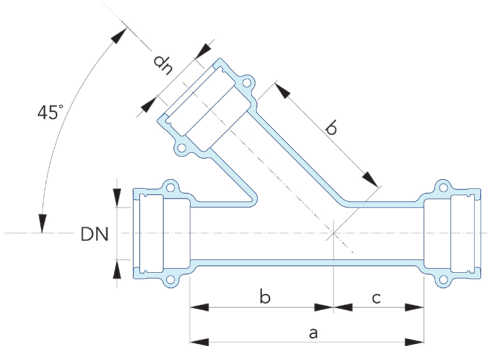
[1]Series 1 fittings fitted with adaptor seal are rated at PN12.

Product specification

Application: Used for branching off a pipeline.

Note:

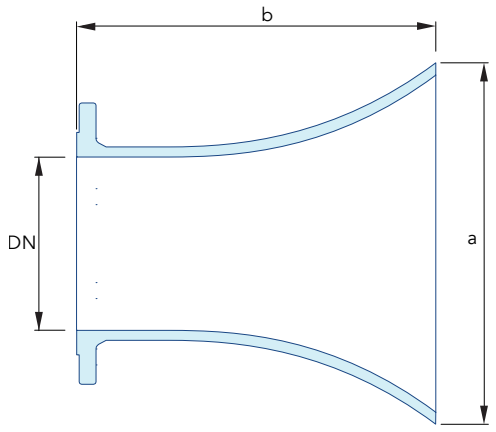
1. **All dimensions are in accordance with AS/NZS 2280, where applicable.**
2. **DN (nominal size) is an alphanumeric designation of size used for reference purposes only and is indirectly related to the physical size of the bore or outside diameter of the end connections (in millimeters).**



3.9 Bell mouth, caps and blank flanges

Bell mouths

DN	Product code PN16	Dim. (mm) a	Dim. (mm) b
80	C19.08	168	154
100	C19.10	216	230
150	C19.15	250	305
200	C19.20	400	305
225	C19.22	420	305
250	C19.25	473	385
300	C19.30	645	455
375	C19.37	552	600
450	C19.45	674	605
500	C19.50	750	750
600	C19.60	782	895
750	C19.75	1140	922



Product specification

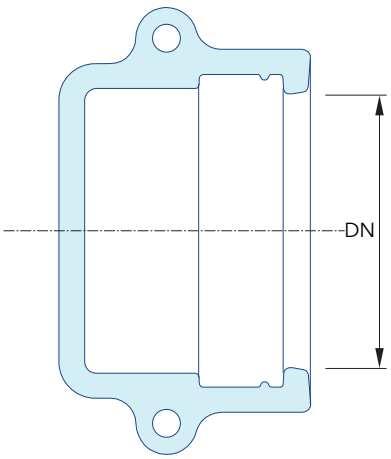
Application: Used in reservoir levels.

Caps

DN	Product codes	
	Series 2 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] DN375-750 rated at PN35.

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

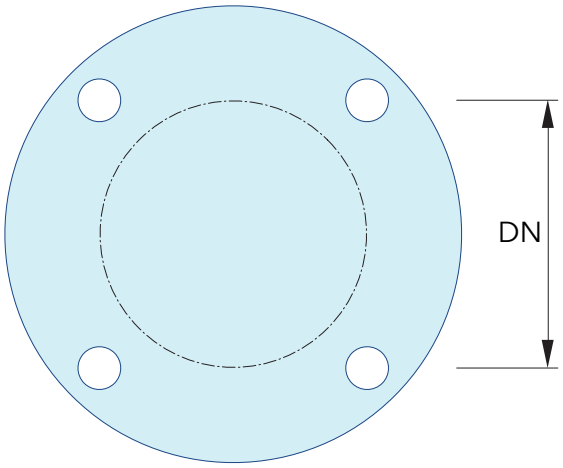


Product specification

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 flanges to AS2129 are also available on request. To denote Table E flanges, the letter 'E' is added to the end of the product code.**
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 of the bore or outside diameter of the end connections (in millimeters).**

3.10 Adapta flanges

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°

Note:

The thickness of the Adapta flange will not necessarily be the same as the mating flange. This may require nonstandard bolt lengths for making the connection.

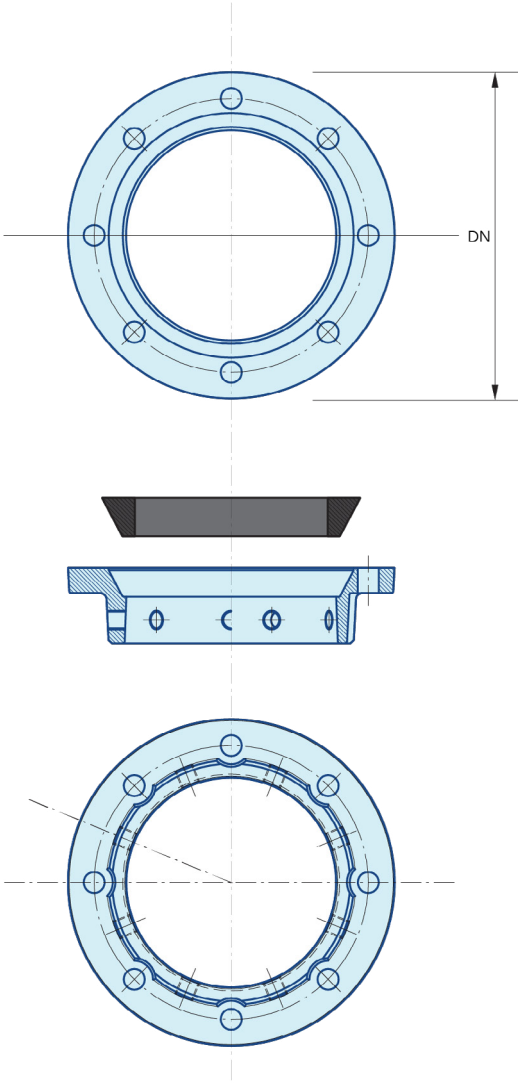
Adapta Flanges must be used with PN35 Irontite pipe for sizes DN100 to DN250. For sizes DN300 and greater, 'Flanged Class' pipe must be used to accommodate higher set screw torque requirements.

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

Installation: Guidelines for Adapta Flange can be found on page 163.

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 of the bore or outside diameter of the end connections (in millimeters).**



Product specification

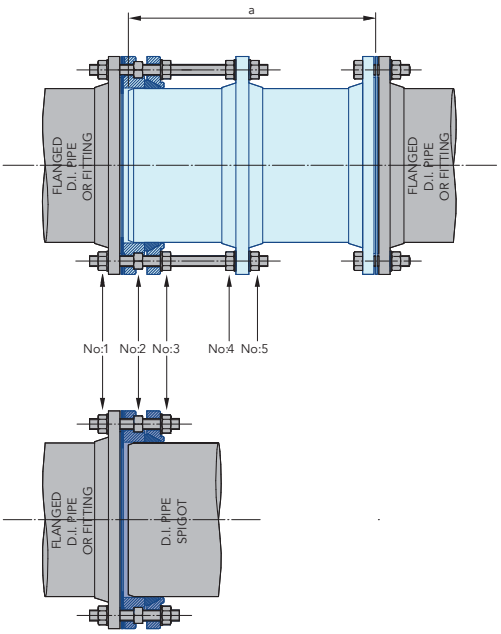
Application: Adapta flanges are manufactured to join plain-ended ductile pipe to flanged valves, fittings, and pipes, eliminating any difficulties usually experienced with rigid connections. Correctly prepared and assembled on ductile iron pipes, Adapta flanges are suitable for pressures up to 1400kPa.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

3.11 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 longitudinal adjustment in flanged pipe systems. They also provide a simple method for the installation and removal of flanged valves, pumps, flow meters and flanged pipework.

Installation: 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.

Guidelines for Dismantling Joints can be found on page 159.

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 millimeters, of the bore or outside diameter of the end connections.**

AVK SUPA-GIB coupling, non-tensile, SS316 sleeve, DI Flanges, NBR seal, PN16

DN	Coupling sealing range (mm)*	Product codes							
		SS A4 Bolts with A4 PTFE coated nuts				Galvanised fasteners			
		110L	136L	176L	216L	110L	136L	176L	216L
40	47-59	C32601.046063[1]							
50	59-71	C32601.059071[1]							
65	72-84	C32601.072084[1]							
80	88-103	C32601.088103S[1]		C32605.088103[1]					
100	109-133	C32601.109133S		C32604.109133		C32601.109133G		C32605.109133G	
125	123-147	C32601.123147[1]							
150	158-182	C32601.158182S		C32605.158182S		C32601.158182G		C32605.158182G	
150	170-194	C32604.240264S[1]							
200	214-238		C32601.218242	C32604.214238S			C32601.214238G	C32605.214238G	
225	240-264		C32604.240264S	C32604.242268				C32601.242268ZR	
250	272-296			C32604.272296S				C32604.272296G	
300	310-334			C32601.310334S				C32601.301327ZR	C32604.310334S
300	330-354			C32601.330354S	C32604.330354				
300	342-366				C32604.342266S[2]				
350	370-394				C32601.372396[2]				
375	410-434				C32604.410434S				
400	436-460				C32601.436462[2]				
450	488-512				C32604.488512S[2]				
500	542-566				C32604.540565S[2]				
500	552-576				C32604.552576S[2]				
525	574-598				C32604.574598S[2]				
600	620-644				C32601.620644[2]				
600	658-682				C32604.656680S[2]				
750	799-823				C32604.799823SS[2]				
750	810-834				C32604.810834S[2]				
750	820-844				C32604.820844SS[2]				

Note:
* Additional dimensions and lengths are available. If required coupling is not listed above contact Iplex.
[1] SUPA-GIB Coupling, Non-tensile, DI Sleeve, DI Flanges, NBR Seal, PN16.
[2] SUPA-GIB Coupling, Non-tensile, SS316 Sleeve, A4 Fasteners, NBR, SS316 Construction, confirm operating pressure by checking datasheet.

SS Sleeve

DI Sleeve[1]

SS316 construction[2]

Product description

- Non-tensile coupling for connecting pipes with equal diameters, for water and neutral liquids to max. 70°C. Manufactured by AVK WANG.
- For water and sewer applications to max 60°C.
- Variable coupling for use on Cast Iron, Ductile Iron, Steel, PVC-U, PVC-M, PVC-O, AC and Copper pipes.
- Provides no longitudinal joint restaint.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 4998.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

A4 Bolts with A4 PTFE coated nuts (SUPA-GIB Coupling, Non-tensile, SS316 Sleeve, DI Flanges, NBR Seal, PN16)

AVK SUPA-GIB COUPLING, NON-TENSILE, DN100-DN600 - AVK Australia Civil (avkcivil.com.au)

[1] SUPA-GIB Coupling, Non-tensile, DI Sleeve, DI Flanges, NBR Seal, PN16

AVK SUPA-GIB COUPLING, NON-TENSILE, DN40-DN175 - AVK Australia Civil (avkcivil.com.au)

[2] SUPA-GIB Coupling, Non-tensile, SS316 Sleeve, A4 Fasteners, NBR, SS316 Construction, confirm operating pressure by checking datasheet

AVK SUPA-GIB COUPLING, NON-TENSILE, DN300-DN1200 - AVK Australia Civil (avkcivil.com.au)

Galvanised Fasteners (SUPA-GIB Coupling, Non-tensile, SS316 Sleeve, DI Flanges, NBR Seal, PN16)

AVK SUPA-GIB COUPLING, NON-TENSILE, DN100-DN300 - AVK Australia Civil (avkcivil.com.au)

AVK SUPA® Step coupling, non-tensile, DI sleeve, EPDM seal, PN16

	Step coupling small opening. Sealing range (mm)	Step coupling large opening. Sealing range (mm)	Product codes
DN	DN1	DN2	
40	46-63	57-74	C32602.063074
40	46-63	68-85	C32602.063085
50	57-74	68-85	C32602.074085
50	57-74	84-106	C32602.074106
65	68-85	84-106	C32602.085106
80	84-106	99-119	C32602.106119
100	84-106	109-133	C32602.106133
100	99-119	109-133	C32602.119133
100	99-119	132-157	C32602.119157
100	109-133	132-157	C32602.133157
100	109-133	157-183	C32602.133183
100	132-157	157-183	C32602.157183
150	157-183	176-201	C32602.183201
150	176-201	193-215	C32602.201215
150	176-201	218-242	C32602.201242
200	193-215	218-242	C32602.215242
200	193-215	242-268	C32602.215268
200	218-242	242-268	C32602.242268
225	242-268	266-292	C32602.268292
250	266-292	280-306	C32602.292306
250	266-292	301-327	C32602.292327
300	301-327	324-350	C32602.327350
300	301-327	352-378	C32602.327378
300	324-350	352-378	C32602.350378
350	352-378	372-396	C32602.378396
350	372-396	384-410	C32602.396410
350	384-410	410-436	C32602.410436
400	410-436	436-462	C32602.436462

Product description

- Universal Supa® step coupling for drinking water and neutral liquids to max. 70°C.
- AVK Supa® is a range of universal straight couplings, step couplings and flange adaptors for cast iron, ductile iron, steel, uPVC. and asbestos cement pipes. Supa® couplings are easy to mount due to the anti-friction coated bolts and nuts and the possibility of up to ±4° angular deflection.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 4998.
- Drinking water approved EPDM gasket.
- Ductile iron with fusion bonded epoxy coating in compliance with DIN 3476 part 1 and EN 14901, GSK approved.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK SUPA® STEP COUPLING, NON-TENSILE, DN40-DN400 - AVK Australia Civil (avkcivil.com.au)

General notes

*Additional dimensions and lengths are available. If required coupling is not listed above contact Iplex.

AVK SUPA-GIB end cap, DI body, A4 fasteners, NBR seal, PN16

DN*	Coupling sealing range (mm)*	Product codes
80	88-103	C32248.08
100	109-133	C32248.10
150	158-182	C32248.15
200	214-238	C32248.20
225	240-264	C32248.22
250	272-296	C32248.25
300	330-354	C32248.30

Note:

*Additional dimensions and lengths are available. If required coupling is not listed above contact Iplex.

Product description

- Supa-gib blank end for water and sewer application to max. 60°C.
- Variable supa-gib blank end for use on Cast Iron, Ductile Iron, Steel, PVC-U, PVC-M, PVC-O, AC and Copper pipes.

Standards

(open below link to check certification status.)

- All materials AS/NZS 4020 compliant.
- Manufactured in accordance with AS/NZS 4998.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK SUPA-GIB END CAP, DN80-DN300 - AVK Australia Civil (avkcivil.com.au)

AVK SUPA PLUS™ coupling, tensile connection for PE pipes, PN16

DN	Product code
90	C32621.90PE
110	C32621.110PE
125	C32621.125PE
140	C32621.140PE
160	C32621.160PE
180	C32621.180PE
200	C32621.200PE
225	C32621.225PE
250	C32621.250PE
280	C32621.280PE
315	C32621.315PE

Product description

- Supa Plus coupling, tensile for PE pipes with A4 nuts and bolts. For drinking water and neural liquids to max. 70°C.
- AVK Supa Plus™ is a range of tensile couplings, flange adaptors and end caps for connection to PE100 pipes. Supa Plus™ couplings are very easy to use due to the compression gasket that enables ±3.5° angular deflection and provides sufficient clearance that allows easy insertion of the pipe even in the larger dimensions. The M16 bolts of anti-friction coated stainless steel and the high quality epoxy coating offer durable corrosion protection.
- Compliance to AS/NZS 4129 requires the use of a series 05 support bush to be fitted to the PE pipe end when using Supa Plus™ fittings and valves.
- Support bushes are available for PE100 pipe manufactured in accordance with AS/NZS 4130, in SDR's 11,13.6 and 17.
- SDR11 support bush is provided as standard.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 4129. StandardsMark approved to AS/NZS 4129.
- Coating to AS/NZS 4158.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK SUPA PLUS™ COUPLING - AVK Australia Civil (avkcivil.com.au)

AVK SUPA MAXI™ straight coupling, universal tensile connection, PN16

DN*	Coupling sealing range (mm)*	Product codes
50	48 - 71	C32625. 4871
65	69 - 91	C32625. 6991
80	82 - 106	C32625. 82106
100	104 - 133	C32625. 104133
125	132 - 159	C32625. 132159
150	159 - 188	C32625. 159188
200	193 - -227	C32625. 193227
225	224 -257	C32625. 224257
250	266 - 301	C32625. 266301
300	314 - 356	C32625. 314356
350	352 - 396	C32625. 352396
400	392 - -442	C32625. 3922442
450	448 - 510	C32625. 448510
500	498 - 552	C32625. 498552
600	604 - 652	C32625. 604652
700	700 - 745[1]	C32625. 700745
800	800 - 842[2]	C32625. 800842M
800	800 - 842[3]	C32625. 800842P

[1] PN16 Only for non-tensile.
[2] PN16 only for non-tensile / For metallic and AC Pipes.
[3] PN16 only for non-tensile / For plastic pipes.

Product description

- Supa Maxi™ straight coupling, universal tensile connection with A4 fasteners and EPDM seals, for drinking water and neutral liquids -20°C to +70°C.
- AVK's Supa Maxi™ range of universal tensile couplings sets a new standard. The patented SupaGrip™ sealing support system with flexible bracket ensures full support of the gasket and full tensile strength on all pipe types up to PN16. Supa Maxi™ couplings are easy to install as they offer ±4° angular deflection in each end, lifting eyes, and bolts tightened from the sleeve side with no need for retightening. The permanent protection caps protect the couplings during transport and installation.
- Tensile strength on all pipes is ensured by two different metal grip segments - every other of gunmetal for PE/PVC/GRP and of hardened stainless steel for cast iron/ductile iron/steel/stainless steel/asbestos cement pipes. **For PE pipes a support bush must be used.**
- DN50-600 are designed for PN16 (1.5 x 16 = 24 bar). DN50-300 are tested and approved for PN16 by KIWA according to EN 14525, and for DN350-600 KIWA EN 14525 approval is pending.

Standards

(open below link to check certification status.)

- Designed to: EN 14525.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK SUPA MAXI™ STRAIGHT COUPLING - AVK Australia Civil (avkcivil.com.au)

AVK support bush, wedge type for use with PE pipes

Fitting Size (PE)* (mm)	Nominal Size (mm)	SDR (mm)	Product code
110	100	17	C05011017
110	100	11	C05011011
110	100	13.6	C050110136
125	125	17	C05012517
125	125	11	C05012511
125	125	13.6	C050125136
140	125	17	C05014017
140	125	11	C05014011
140	125	13.6	C050140136
160	150	17	C05016017
160	150	11	C05016011
160	150	13.6	C050160136
180	175	17	C05018017
180	175	11	C05018011
180	175	13.6	C050180136
200	200	17	C05020017
200	200	11	C05020011
200	200	13.6	C050200136
225	225	17	C05020017
225	225	11	C05020011
225	225	13.6	C050225136
250	250	11	C05025011
250	250	13.6	C050250136
280	275	17	C05028017
280	275	11	C05028011
280	275	13.6	C050280136
315	300	17	C05031517
315	300	11	C05031511
315	300	13.6	C050315136
355	350	17	C05035517
355	350	11	C05035511
400	400	17	C050355136
400	400	11	C05040011
400	400	13.6	C050400136
450	450	17	C05040017
500	500	17	C05050017
500	500	11	C05050011
630	600	17	C05063017
630	600	11	C05063011

Product description

- Support bush for PE pipes.
- AVK recommends usage of a support bushes in PE pipes when using a tensile coupling or flange adaptor such as an AVK combi-flange and a Supa Plus™ or Supa Maxi™ coupling. AVK support bushes are made of stainless steel AISI 304 and are available for SDR 11, SDR 13,6, SDR 17 and SDR 17,6 PE pipes. For pipes in rolls, AVK recommends using support bushes in order to ensure correct chamfering and restore the roundness of the pipe.

Features

- Support bush is manufactured from stainless steel AISI 304.
- In order to prevent corrosion, the support bush is pickled and passivated.
- Standard sizes are SDR 11, SDR 13.6, SDR 17 and SDR 17.6. Other SDR sizes are available on request.
- Available for PE pipes DN 50 - DN 400. Other DN sizes are available on request.

Additional information

For General Information, Datasheets and IOM Guide open below link;

AVK Support Bush, Wedge Type - AVK Australia Civil (avkcivil.com.au)

* For sizes not listed above, contact Iplex.

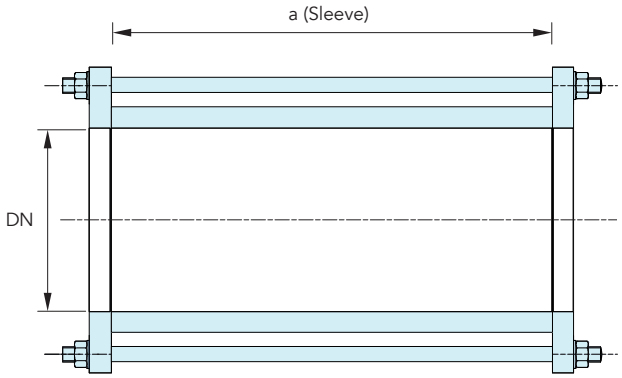
3.12 Gibault joints

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 (Machined spigot/barrels only)



Installation: Guidelines for Gibault Joints can be found on page 158.

Note:

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

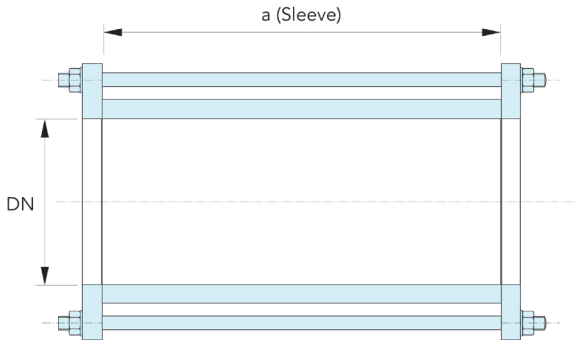
Long barrel - PN16

DN	Product code	Description 1	Description 2	Dim. (mm) a
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 page 158.

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

Blank long barrel - PN16

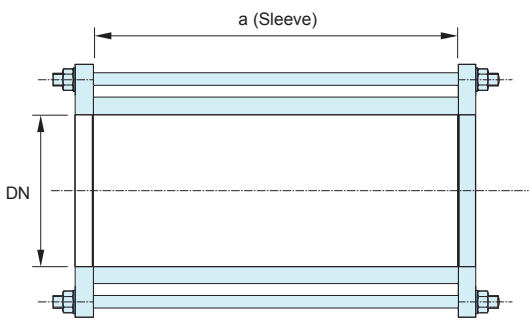
DN	Product code	Description 1	Description 2	Dim. (mm) a
58	C3185.05	58 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	100
58	C3185.05S	58 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING PN16	100
80	C3185.08	80 GIBAULT BLANK S2 ELONG	NC GS BOLTING PN16	150
80	C3185.08S	80 GIBAULT BLANK S2 ELONG SS	NC 316 SS BOLTING 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 the following pipe types:

- AC
- Ductile Iron
- Cast Iron
- S2 PVC

Installation: Guidelines for Gibault Joints can be found on page 158.



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

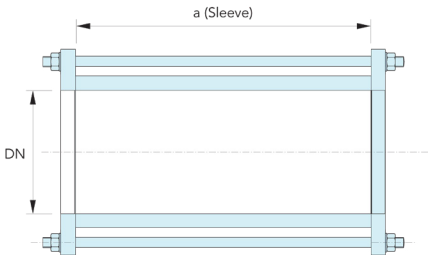
DN	Product code	Description 1	Description 2	Dim. (mm) a
80	C3181.08	80 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	95
80	C3181.08S	80 GIBAULT BLANK S1 PVC SS	BD 316 SS BOLTING PN16	95
100	C3181.10	100 GIBAULT BLANK S1 PVC	NC GS BOLTING PN16	95
100	C3181.10S	100 GIBAULT BLANK S1 PVC SS	NC 316 SS BOLTING PN16	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 page 158.

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



3.13 Multi-fit joints

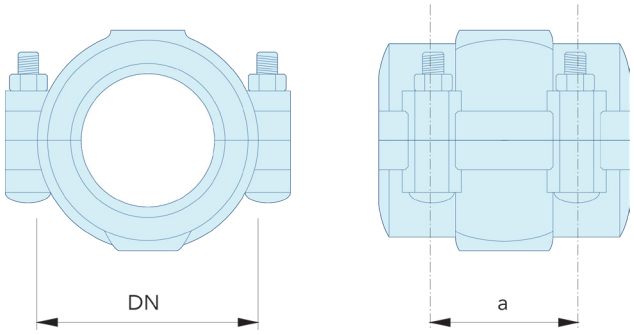
Multi-fit joints - DI, CI, AC and S2 PVC

Multi-fit joints 4 and 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

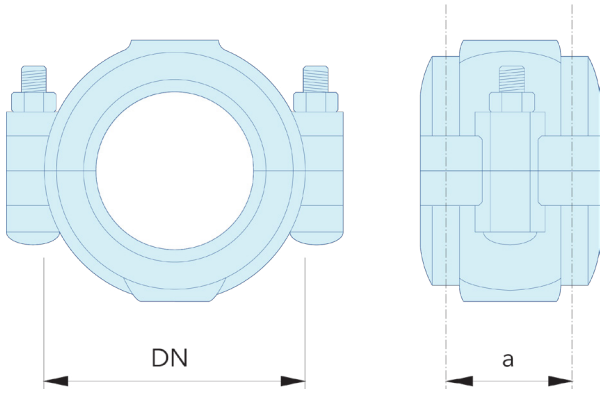
Multi-fit joints 2 bolt

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 molded rubber seals. The seals sit in the longitudinal and circumferential grooves of each casting. Cup head bolts into the castings to clamp each casting together to form a water light seal. Lubricant must be applied to the pipe surfaces to assist when fitting the joint.

Multi-fit Joints can be used with:

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

Installation: Guidelines for Multi-fit Joints can be found on page 157.

Note:

1. **Tapping's 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 of the bore or outside diameter of the end connections (in millimeters).**

3.14 Tapping bands

Taptite® tapping bands without seal nut

DN	Product codes	
	Taptite Blue Series 2	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 Blue bands are classified as Type F and R.

Note: Type F bands are designed for use with flexible pipes, typically PVC Series 1 and Series 2. 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 coating 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 page 152.

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

Taptite In-Liner

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

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

Product specification

Application: Tool used for insertion of in-liner.

Installation: Guidelines for Taptite In-liner can be found on page 152.

3.15 Milnes® valves and accessories

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
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

Milnes tapping bands for Series 1 (White) PVC continued

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60A10040	100X40RP T/BND GM S1PVC	100	114	40	1 ½
GM60A10050	100X50RP T/BND GM S1PVC	100	114	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
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
GM60A25050	250X50RP T/BND GM S1PVC	250	280	50	2
GM60A30020	300X20RP T/BND GM S1PVC	300	315	20	¾

Milnes tapping bands for Series 1 (White) PVC continued

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
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
GM60A37550	375X50RP T/BND GM S1PVC	375	400	50	2

Product specification

Application: Mechanical tapping bands provide a means for the connection of service pipes from a pipeline.

Suitable for: AS/NZS 1477 Series 1 White UPVC Pipe and AS/NZS 4765 Series 1 MPVC Pipe.

Product standard: AS/NZS 4793.

Pressure rating: PN16.

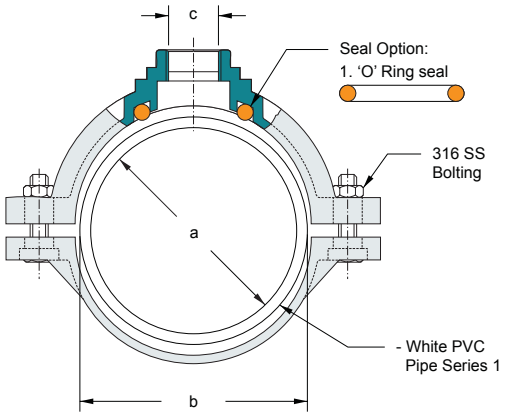
Metallic material: AS1565 Gunmetal.

Bolting: 316 Stainless Steel Bolt Type F.

Seal: AS 1646 Nitrile rubber.

Potable water compliance: AS 4020.

Installation: Guidelines for Tapping Bands can be found on page 152.



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.**

Milnes tapping bands for Series 2 (Blue) PVC, AC

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
GM60B5820ELS	58X20RP T/BND GM AC/S2	58	78	20	¾
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
GM60B8040	80X40RP T/BND GM AC/S2	80	96	40	1 ½
GM60B8050	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
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

Milnes tapping bands for Series 2 (Blue) PVC, AC continued

Product code	Description	Typical dimensions			
		Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
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
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
GM60B22520ELS	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
GM60B22550	225X50RP T/BND GM AC/S2	225	259	50	2

Product specification

Application: Mechanical tapping bands provide a means for the connection of service pipes from a pipeline.

Suitable for: AS/NZS 4765 Series 2 MPVC and AS/NZS 4441 Series 2 OPVC.

Product standard: AS/NZS 4793.

Pressure rating: PN16.

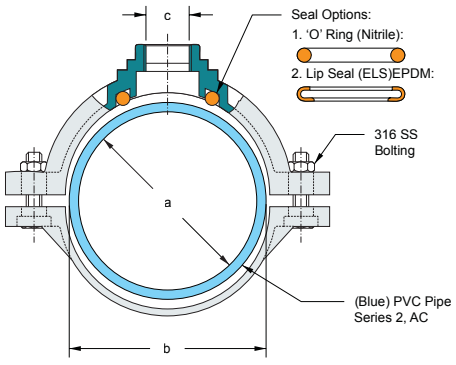
Metallic material: AS1565 Gunmetal.

Bolting: 316 Stainless Steel.

Seal: AS 1646 Nitrile or EPDM.

Potable water compliance: AS 4020.

Installation: Guidelines for Tapping Bands can be found on page 152.



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.**

Milnes tapping bands for Series 2 (Blue) PVC, AC 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
GM60B30025	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
GM60B30050	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
GM60B37550	375X50RP T/BND GM AC/S2	375	426	50	2
GM60B37550ELS	375X50RP T/BND GM AC/S2	375	426	50	2

Product specification

Application: Mechanical tapping bands provide a means for the connection of service pipes from a pipeline.

Suitable for: AS/NZS 4765 Series 2 MPVC and AS/NZS 4441 Series 2 OPVC.

Product standard: AS/NZS 4793.

Pressure rating: PN16.

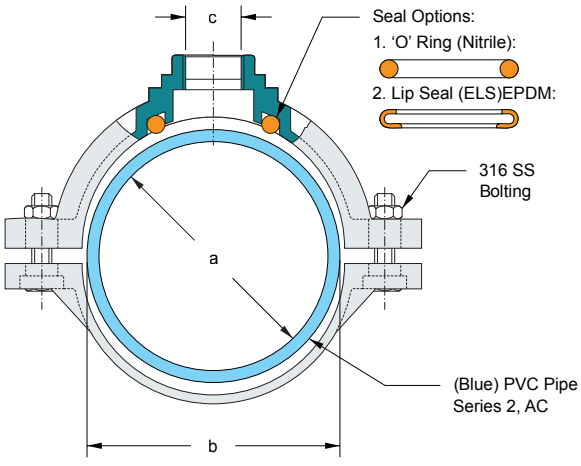
Metallic material: AS1565 Gunmetal.

Bolting: 316 Stainless Steel.

Seal: AS 1646 Nitrile or EPDM.

Potable water compliance: AS 4020.

Installation: Guidelines for Tapping Bands can be found on page 152.



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.**

Milnes tapping bands for irrigation (polyethylene pipe)

Product code (Preferred)	Alternative product code (where applicable) (physically equivalent product)	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 60OD BRASS BOLT	50	60	20	¾
GM60C6320		63X20RP T/BND GM MDPE 63OD 316 SS BOLT TYPE F	63	63	20	¾
GM60C6325		63X25RP T/BND GM MDPE 63OD 316 SS BOLT TYPE F	63	63	25	1
GM60A6520	GM60C7520	65X20RP T/BND GM S1PVC 75OD 316 SS BOLT TYPE F=GM60C7520	65	75	20	¾
GM60A6525	GM60C7525	65X25RP T/BND GM S1PVC 75OD 316 SS BOLT TYPE F=GM60C7525	65	75	25	1
GM60A6540	GM60C7540	65X40RP T/BND GM S1PVC 75OD 316 SS BOLT TYPE F=GM60C7540	65	75	40	1 ½
GM60A8015	GM60C9015	80X15RP T/BND GM S1PVC 89OD 316 SS BOLT TYPE F=GM60C9015	80	89	15	1/2
GM60A8020	GM60C9020	80X20RP T/BND GM S1PVC 89OD 316 SS BOLT TYPE F=GM60C9020	80	89	20	¾
GM60A8025	GM60C9025	80X25RP T/BND GM S1PVC 89OD 316 SS BOLT TYPE F=GM60C9025	80	89	25	1
GM60A8032	GM60C9032	80X32RP T/BND GM S1PVC 89OD 316 SS BOLT TYPE F=GM60C9032	80	89	32	1 ¼
GM60A8040	GM60C9040	80X40RP T/BND GM S1PVC 89OD 316 SS BOLT TYPE F=GM60C9040	80	89	40	1 ½
GM60A8050	GM60C9050	80X50RP T/BND GM S1PVC 89OD 316 SS BOLT TYPE F=GM60C9050	80	89	50	2
GM60C11050		110X50RP T/BND GM MDPE 110OD 316 SS BOLT TYPE F	110	110	50	2
GM60C12520		125X20RP T/BND GM MDPE 125OD 316 SS BOLT TYPE F	125	125	20	¾
GM60C12525		125X25RP T/BND GM MDPE 125OD 316 SS BOLT TYPE F	125	125	25	1

Milnes tapping bands for irrigation (polyethylene pipe) continued

Product code (Preferred)	Alternative product code (where applicable) (physically equivalent product)	Description	Typical dimensions			
			Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60C12532		125X32RP T/BND GM MDPE 125OD 316 SS BOLT TYPE F	125	125	32	1 ¼
GM60C12540		125X40RP T/BND GM MDPE 125OD 316 SS BOLT TYPE F	125	125	40	1 ½
GM60C12550		125X50RP T/BND GM MDPE 125OD 316 SS BOLT TYPE F	125	125	50	2
GM60A15020	GM60C16020	150X20RP T/BND GM S1PVC 160OD 316 SS BOLT TYPE F=GM60C16020	150	160	20	¾
GM60A15025	GM60C16025	150X25RP T/BND GM S1PVC 160OD 316 SS BOLT TYPE F=GM60C16025	150	160	25	1
GM60A15032	GM60C16032	150X32RP T/BND GM S1PVC 160OD 316 SS BOLT TYPE F=GM60C16032	150	160	32	1 ¼
GM60A15040	GM60C16040	150X40RP T/BND GM S1PVC 160OD 316 SS BOLT TYPE F =GM60C16040	150	160	40	1 ½
GM60A15050	GM60C16050	150X50RP T/BND GM S1PVC 160OD 316 SS BOLT TYPE F=GM60C16050	150	160	50	2
GM60C18020		180X20RP T/BND GM MDPE 180OD 316 SS BOLT TYPE F	180	180	20	¾
GM60C18025		180X25RP T/BND GM MDPE 180OD 316 SS BOLT TYPE F	180	180	25	1
GM60C18032		180X32RP T/BND GM MDPE 180OD 316 SS BOLT TYPE F	180	180	32	1 ¼
GM60C18040		180X40RP T/BND GM MDPE 180OD 316 SS BOLT TYPE F	180	180	40	1 ½
GM60C18050		180X50RP T/BND GM MDPE 180OD 316 SS BOLT TYPE F	180	180	50	2
GM60A20020	GM60C22520	200X20RP T/BND GM S1PVC 225OD 316 SS BOLT TYPE F=GM60C22520	200	225	20	¾

Milnes tapping bands for irrigation (polyethylene pipe) continued

Product code (Preferred)	Alternative product code (where applicable) (physically equivalent product)	Description	Typical dimensions			
			Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60A20025	GM60C22525	200X25RP T/BND GM S1PVC 225OD 316 SS BOLT TYPE F=GM60C22525	200	225	25	1
GM60A20040	GM60C22540	200X40RP T/BND GM S1PVC 225OD 316 SS BOLT TYPE F =GM60C22540	200	225	40	1 ½
GM60A20050	GM60C22550	200X50RP T/BND GM S1PVC 225OD 316 SS BOLT TYPE F=GM60C22550	200	225	50	2
GM60A22520	GM60C25020	225X20RP T/BND GM S1PVC 250OD 316 SS BOLT TYPE F=GM60C25020	225	250	20	¾
GM60A22525	GM60C25025	225X25RP T/BND GM S1PVC 250OD 316 SS BOLT TYPE F=GM60C25025	225	250	25	1
GM60A22532	GM60C25032	225X32RP T/BND GM S1PVC 250OD 316 SS BOLT TYPE F=GM60C25032	225	250	32	1 ¼
GM60A22540	GM60C25040	225X40RP T/BND GM S1PVC 250OD 316 SS BOLT TYPE F= GM60C25040	225	250	40	1 ½
GM60A22550	GM60C25050	225X50RP T/BND GM S1PVC 250OD 316 SS BOLT TYPE F=GM60C25050	225	250	50	2
GM60A25020	GM60C28020	250X20RP T/BND GM S1PVC 280OD 316 SS BOLT TYPE F =GM60C28020	250	280	20	¾
GM60A25025	GM60C28025	250X25RP T/BND GM S1PVC 280OD 316 SS BOLT TYPE F=GM60C28025	250	280	25	1
GM60A25032	GM60C28032	250X32RP T/BND GM S1PVC 280OD 316 SS BOLT TYPE F =GM60C28032	250	280	32	1 ¼
GM60A25050	GM60C28050	250X50RP T/BND GM S1PVC 280OD 316 SS BOLT TYPE F =GM60C28050	250	280	50	2
GM60A30020	GM60C31520	300X20RP T/BND GM S1PVC 315OD 316 SS BOLT TYPE F =GM60C31520	300	315	20	¾

Milnes tapping bands for irrigation (polyethylene pipe) continued

Product code (Preferred)	Alternative product code (where applicable) (physically equivalent product)	Description	Typical dimensions			
			Nominal diameter (mm) a	Pipe OD (mm) b	Tapping BSP (mm) c	Tapping BSP (inch) c
GM60A30025	GM60C31525	300X25RP T/BND GM S1PVC 315OD 316 SS BOLT TYPE F=GM60C31525	300	315	25	1
GM60A30040	GM60C31540	300X40RP T/BND GM S1PVC 315OD 316 SS BOLT TYPE F=GM60C31540	300	315	40	1 ½
GM60A30050	GM60C31550	300X50RP T/BND GM S1PVC 315OD 316 SS BOLT TYPE F=GM60C31550	300	315	50	2
GM60A37550	GM60C40050	375X50RP T/BND GM S1PVC 400OD 316 SS BOLT TYPE F=GM60C40050	375	400	50	2

Product specification

Application: Mechanical tapping bands provide a means for the connection of service pipes from a pipeline.

Suitable for: AS/NZS 4130 MDPE and HDPE.

Pressure rating: PN16.

Metallic material: AS 1565 Gunmetal.

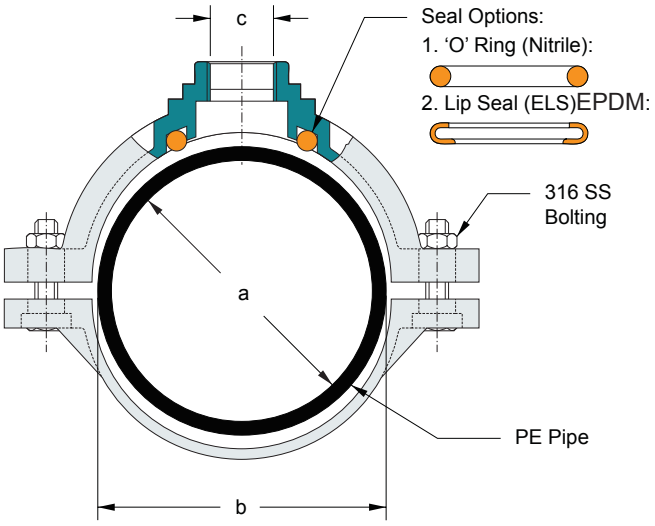
Bolting: 316 Stainless Steel.

Seal: AS 1646 Nitrile or EPDM.

Installation: Guidelines for Tapping bands can be found on page 152.

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.**

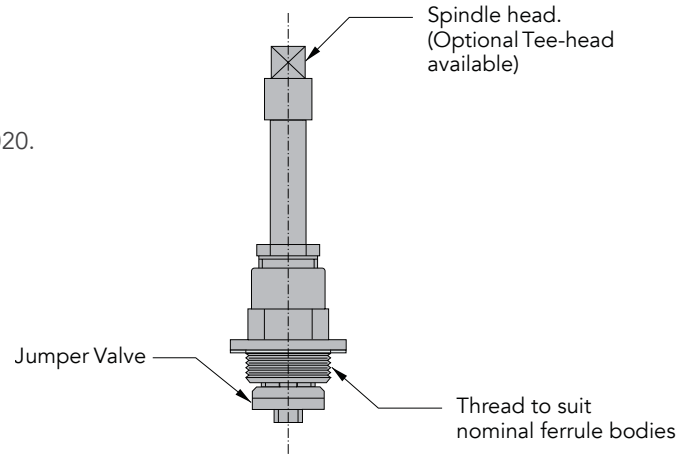


Milnes pressure tapping ferrules bonnet assembly

Product code	Description	Dim. (mm) a
GM7020BA	20 TPFNR BONNET ASSY	20
GM7025BA	25 TPFNR BONNET ASSY	25

Product specification

Product standard: AS/NZS 3718.
Pressure rating: PN16.
Potable water compliance: AS 4020.

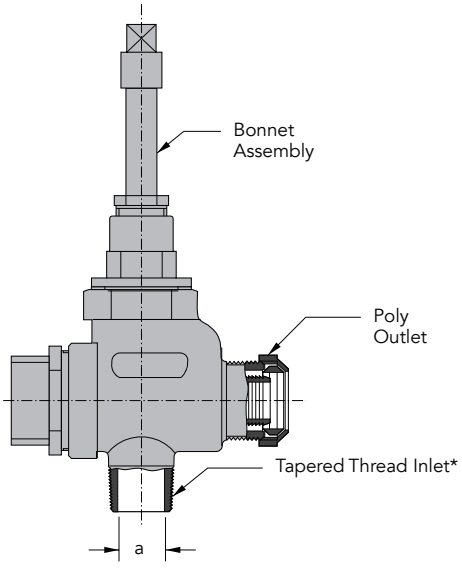


Pressure tapping ferrule with bonnet assembly

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

Product specification

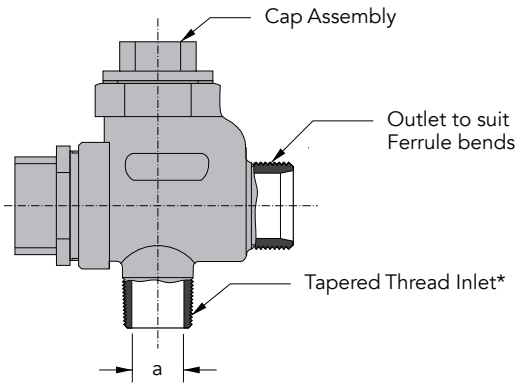
Product standard: AS/NZS 3718.

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.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**



*Refer to thread standard Series 'R' - Sealing pipe thread, external. Refer to AS 1722.1 for further details.

Milnes pressure tapping ferrules pressure tapping ferrules with poly outlet and bonnet assembly

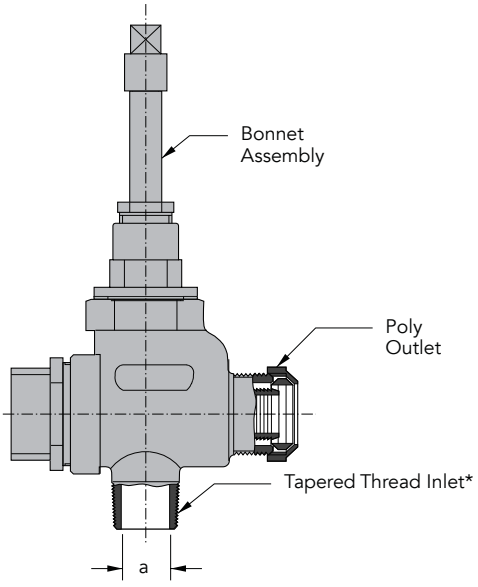
Product code	Description	Dim. (mm) a
GM7020BP	20 PPFNR WITH BONNET POLY	20
GM7025BP	25 PPFNR WITH BONNET POLY	25

Product specification

Product standard: AS/NZS 3718.

Pressure rating: PN16.

Potable water compliance: AS 4020.



*Refer to thread standard Series 'R' - Sealing pipe thread, external. Refer to AS 1722.1 for further details.

Milnes pressure tapping ferrules

Pressure tapping ferrules with ferrule bends outlet and bonnet assembly

Product code	Description	Dim. (mm) a
Soldered bend		
GM7020BSB	20 PPFNR WITH BONNET	20
GM7025BSB	25 PPFNR WITH BONNET	25
Plain bend		
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

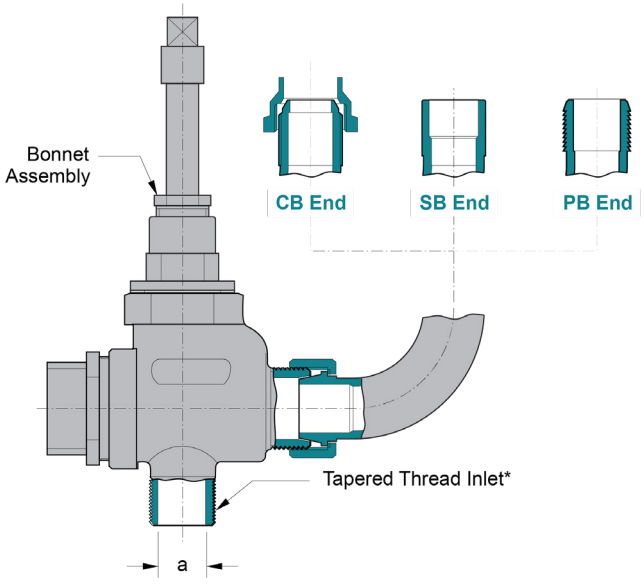
Product standard: AS/NZS 3718.

Pressure rating: PN16.

Potable water compliance: AS 4020.

Note:

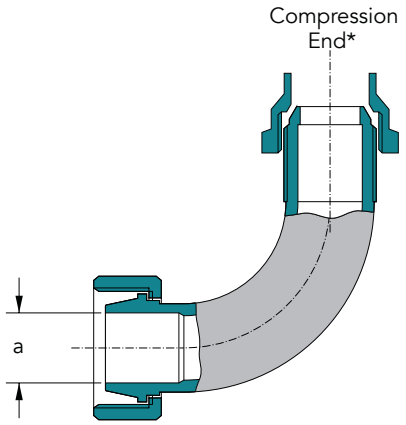
1. **The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**



*Refer to thread standard Series 'R' - Sealing pipe thread, external.
Refer to AS 1722.1 for further details.

Milnes ferrule bends compression bend

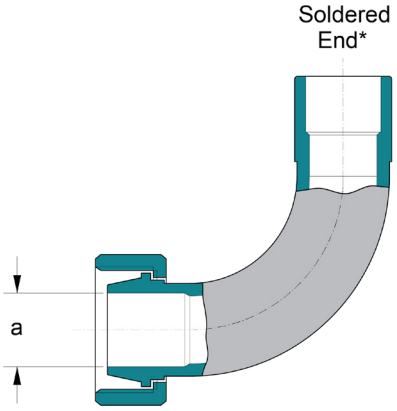
Product code	Description	Dim. (mm) a
GM7020CB	20 FERRULE BEND COMP	20
GM7025CB	25 FERRULE BEND COMP	25
GM7032CB	32 FERRULE BEND COMP	32
GM7040CB	40 FERRULE BEND COMP	40
GM7050CB	50 FERRULE BEND COMP	50



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

Soldered bend

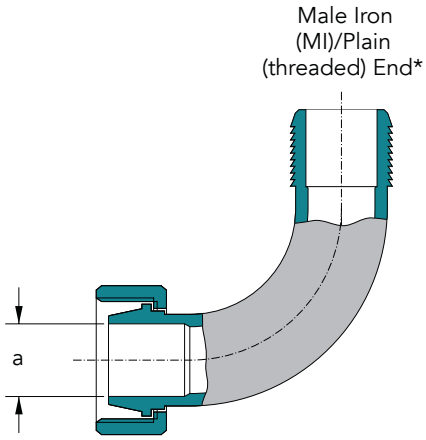
Product code	Description	Dim. (mm) a
GM7020SB	20 FERRULE BEND SOLDERED	20
GM7025SB	25 FERRULE BEND SOLDERED	25
GM7032SB	32 FERRULE BEND SOLDERED	32
GM7040SB	40 FERRULE BEND SOLDERED	40
GM7050SB	50 FERRULE BEND SOLDERED	50



*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. 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 153-156.

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

Milnes standard ferrules bonnet assembly

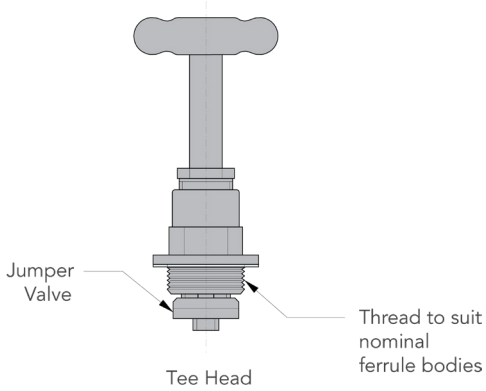
Product code	Description	Dim. (mm) a
GM71B20	20 TEE HEAD BONNET ASSY	20

Product specification

Product standard: AS/NZS 3718.

Pressure rating: PN16.

Potable water compliance: AS 4020.



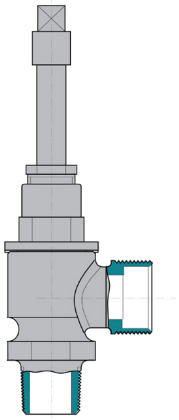
Standard ferrule

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.



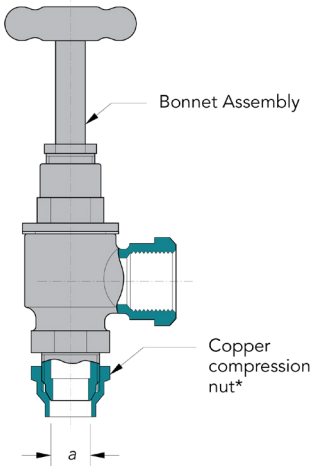
Milnes stop tap meter: female outlet

Product code	Description	Dim. (mm) a
GM73A20	20 STOP TAP METER CC X FI RIGHT ANGLE	20
GM73A25	25 STOP TAP METER CC X FI RIGHT ANGLE	25

Product specification

Product standard: AS/NZS 3718.

Pressure rating: PN16.



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

Note:

1. **The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**

Milnes ball valves

Inline ball valve female – female

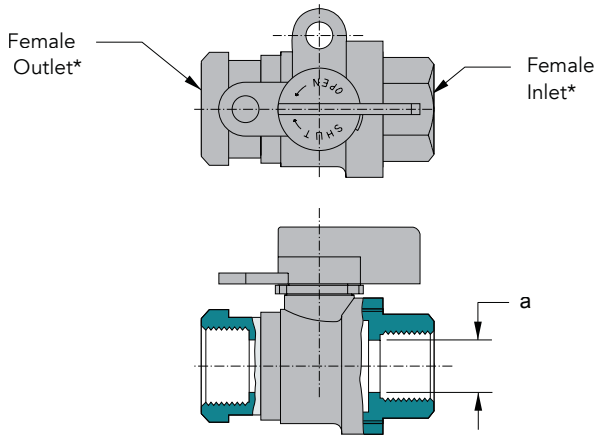
Product code	Description	Dim. (mm) a
GM7620N	20 BALL VALVE INLINE FI/FI LOCKABLE HANDLE	20
GM7625N	25 BALL VALVE INLINE FI/FI LOCKABLE HANDLE	25

Product specification

Product standard: AS/NZS 4796.

Pressure rating: PN16.

Potable water compliance: AS 4020.



Standard lockable handle shown

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

Inline ball valve female – poly

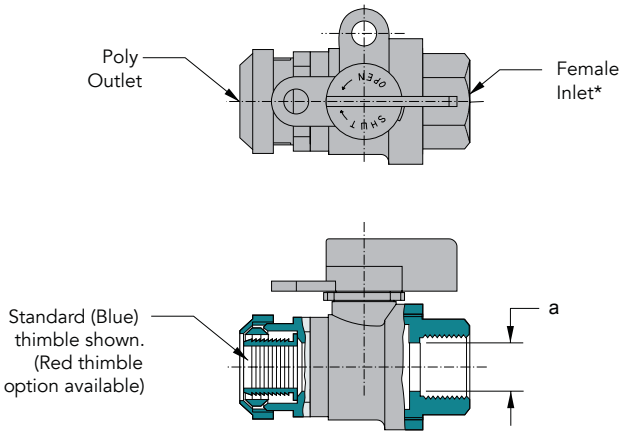
Product code	Description	Dim. (mm) a
GM7625LP	25 BALL VALVE INLINE FI/PE	25

Product specification

Product standard: AS/NZS 4796.

Pressure rating: PN16.

Potable water compliance: AS 4020.



Standard lockable handle shown

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

Inline ball valve female poly push-in

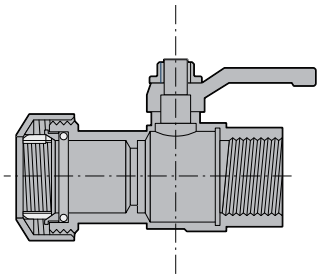
Product code	Description	Dim. (mm) a
GM7620PN	20 BALL VALVE INLINE FI/PE	20
GM7620PRN	20 BALL VALVE INLINE FI/PE LILAC HANDLE	20

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.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**

Milnes ball valves

Inline ball valve male-female

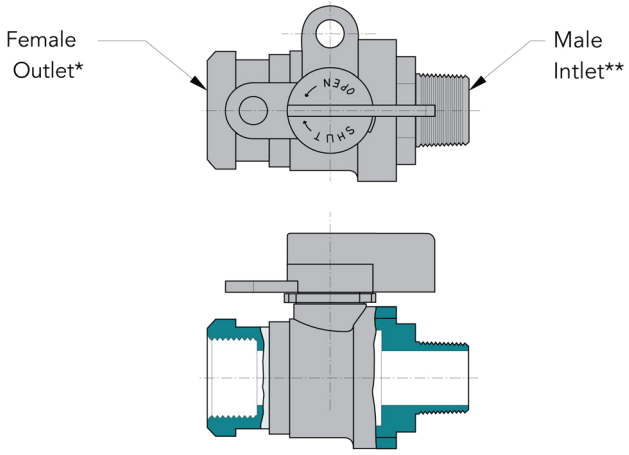
Product code	Description	Dim. (mm) a
GM76A20N	20 BALL VALVE INLINE MI/FI LOCKABLE HANDLE	20
GM76A25N	25 BALL VALVE INLINE MI/FI LOCKABLE HANDLE	25

Product specification

Product standard: AS/NZS 4796.

Pressure rating: PN16.

Potable water compliance: AS 4020.



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

** Refer to thread standard Series 'R' - Sealing pipe thread, external. Refer to AS 1722.1 for further details.

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.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**

Milnes ball valves

Right angle ball valve female – female

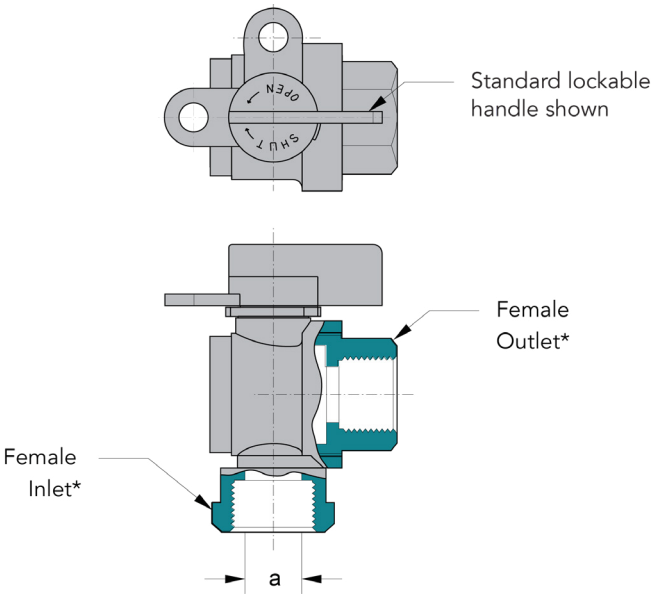
Product code	Description	Dim. (mm) a
GM7720N	20 BALL VALVE R/ANGLE FI/FI	20
GM7725	25 BALL VALVE R/ANGLE FI/FI	25

Product specification

Product standard: AS/NZS 4796.

Pressure rating: PN16.

Potable water compliance: AS 4020.



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

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

Product specification

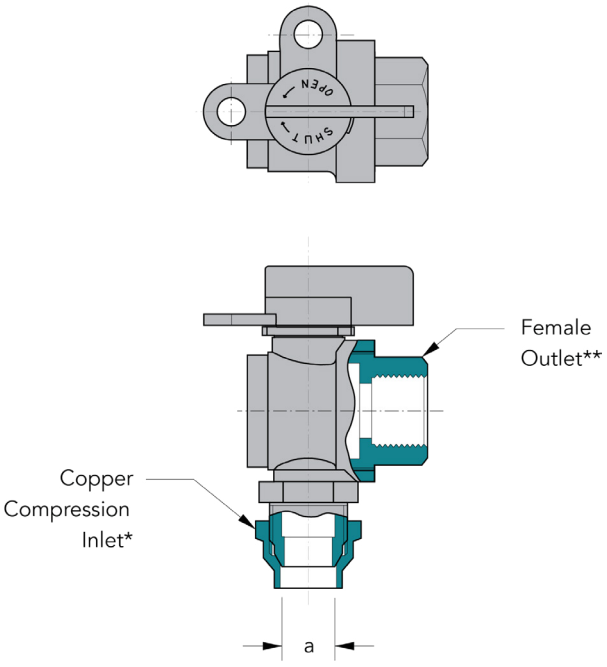
Product standard: AS/NZS 4796.

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.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**



Standard lockable handle shown

*Refer to thread standard Series 'G' Fastening Pipe Thread Internal Thread and 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.

Milnes valve kits

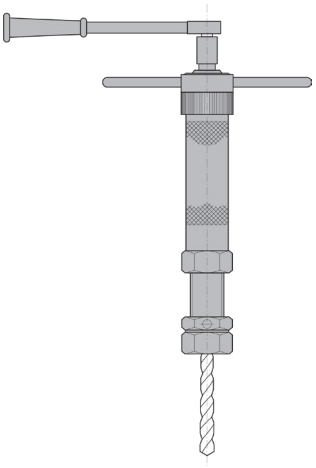
20mm tapping set ball valve kit - without termination box (push-in)		
Product Code	**Description**	**Kit Includes**
GM78A20AN	20 TAPPING SETBALL VALVE VIC DR - WITHOUT TERMINATION BOX	GM7620PN – 20mm Inline Ball Valve FI/PE Push-in GM76A20PN – 20mm Inline Ball Valve MI/PE Push-in
GM78A20APN	20 TAPPING 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

Note:

1. **The illustration shown is intended to serve as a guide only. Detailed drawings and specification can be obtained by contacting Iplex.**
2. **Installation guidelines for Tapping Ferrules and connection ends can be found on pages 153-156.**

Milnes accessories

Tapping Machines							
Product code	**Description**	**Tapping sizes**					
		15mm	**20mm**	**25mm**	**32mm**	**40mm**	**50mm**
C2191.05	Service Tapping Machine	✓	✓	✓	×	×	×
C2191.06	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 AC, CI and DI pipes. Fluted hole drills are available for use with PE and PVC pipes.

Replacement drill bits are available on request.

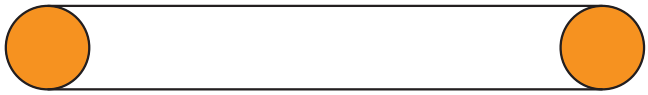
3.16 Seals

'O' Ring seal replacement

Product code	Description	Suits tapping size
GMOR60041	41 X 8.5 Nitrile 'O' Ring	20,25 and 32
GMOR60062	62 x 11 Nitrile 'O' Ring	40 and 50

Product specification

For tapping bands to suit pipe up to nominal 200mm outside diameter only. For pipe outside diameter greater than 200mm the 'O' ring seal replacement **GMOR60062 must be used** regardless of the tapping size.



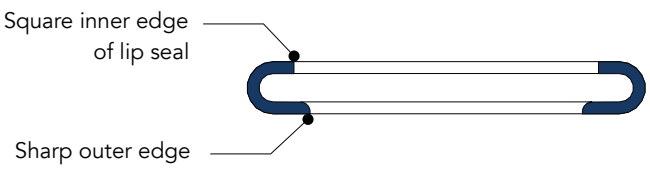
Lip seal replacement

Product code	Description	Suits tapping size
GMOR60780	Small EPDM Lip Seal	20,25 and 32
GMOR60790	Large EPDM Lip Seal	40 and 50

Product specification

For tapping bands to suit pipe up to nominal 200mm outside diameter only. For pipe outside diameter greater than 200mm the 'O' ring seal replacement **GMOR60790 must be used** 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.



AVK resilient seated gate valve (socket) PN16* – Iplex core offer to the market

DN	Product codes	
	Anti-clockwise closing series 2	Clockwise closing series 2
100	C521.10	C521.10C
150	C521.15	C521.15C
200	C521.20	C521.20C
225	C521.22	C521.22C
250	C521.25	C521.25C
300	C521.30	C521.30C

*DI gland flange (contact Iplex if a SS gland flange is required).

Product description

- Socket gate valve for water, sewage and neutral liquid applications to max. 70°C.
- For AS 4020 compliance, max temp 40°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.
- Socket ends to AS/NZS 2280.
- Coating to AS/NZS 4158.
- Valves comply with AS/NZS 4020.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil

CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated gate valve (socket) PN16* – Iplex general offer to the market

DN	Product codes	
	Anti-clockwise closing series 1	Clockwise closing series 1
100	C522.10	C522.10C
150	C522.15	C522.15C
200	C522.20	C522.20C
225	C522.22	C522.22C
250	C522.25	C522.25C
300	C522.30	C522.30C

*DI gland flange (contact Iplex if a SS gland flange is required).

Product description

- Socket gate valve for water, sewage and neutral liquid applications to max. 70°C.
- For AS 4020 compliance, max temp 40°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.
- Socket ends to AS/NZS 2280.
- Coating to AS/NZS 4158.
- Valves comply with AS/NZS 4020.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil

CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated gate valve (flange) PN16* – Iplex core offer to the market

DN**	Product codes	
	Anti-clockwise closing	Clockwise closing
80	C523.08	C523.08C
100	C523.10	C523.10C
150	C523.15	C523.15C
200	C523.20	C523.20C
225	C523.22	C523.22C
250	C523.25	C523.25C
300	C523.30	C523.30C

*DI gland flange (contact Iplex if a SS gland flange is required).

** For larger valves and/or alternative flange configurations contact Iplex.

Product description

- Flanged gate valve for water, sewage and neutral liquid applications to max. 70°C.
- For AS 4020 compliance, max temp 40°C.

Standards

(open below link to check certification status.)

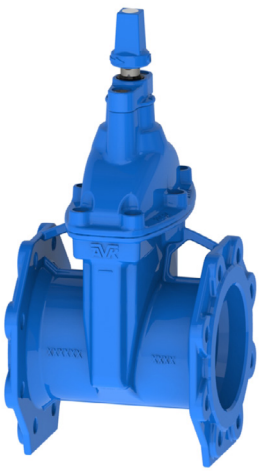
- Designed to: AS/NZS 2638.2.
- Flange drilling to AS/NZS 4087 B5.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)



AVK resilient seated gate valve (flange) PN25

DN	Product codes	
	Anti-clockwise closing	Clockwise closing
50	C5231.05	C5231.05C
80	C5231.08	C5231.08C
100	C5231.10	C5231.10C
150	C5231.15	C5231.15C
200	C5231.20	C5231.20C
250	C5231.25	C5231.25C
300	C5231.30	C5231.30C

Product description

- Resilient seat gate valve for water, sewage and other neutral liquid applications to max. 70°C.
- For AS/NZS 4020 compliance, max. 40°C.

Standards

(open below link to check certification status)

- Flange drilling: AS 2129 F.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN25 - AVK Australia Civil (avkcivil.com.au)

CC AVK GATE VALVE, RESILIENT SEATED, PN25 - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated gate valve PN16 – OY and S (outside screw and yolk)

DN	Product codes	
	Clockwise closing[1]	Clockwise closing[2]
80	C5031.08C	-
100	C5031.10C	C5031.10CE
150	C5031.15C	C5031.15CE
200	C5031.20C	C5031.20CE
225	C5031.22C	C5031.22CE
250	C5031.25C	C5031.25CE
300	C5031.30C	C5031.30CE

[1] Flange drilling to AS/NZS 4087 B5.

[2] Flange drilling: AS 2129 E.

Product description

- Flanged gate valve, OS&Y with handwheel, for drinking water and neutral liquids to max. 70°C.
- For AS/NZS 4020 compliance, max temp 40°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.
- Face-to-face dimension according to AS2638.2.
- 1 Flange drilling to AS/NZS 4087 B5.
- 2 Flange drilling: AS 2129 E.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

1 AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

2 AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated gate valve (flange) PN16 with by-pass fitted

DN	Product codes		Product codes	
	Anti-clockwise closing[1]	Clockwise closing[1]	Anti-clockwise closing[2]	Clockwise closing[2]
450*	C523.45B10	C523.45B10C	C523.45B10E	C523.45B10CE
450**	C523.45B15	C523.45B15C	C523.45B15E	C523.45B15CE
500*	C523.50B10	C523.50B10C	-	-
500**	C523.50B15	C523.50B15C	-	-
600*	C523.60B10	C523.60B10C	C523.60B10E	C523.60B10CE
600**	C523.60B15	C523.60B15C	C523.60B15E	C523.60B15CE
750**	C523.75B15	C523.75B15C	C523.75B15E	C523.75B15CE

* By-pass DN100.

** By-pass DN150.

[1] Flange drilling to AS/NZS 4087 B5.

[2] Flange drilling: AS 2129 E.

General note: By-pass is optional for valves with flange drilling to AS/NZS 4087 B5. Discuss with Iplex if required.

Product description

- Flanged gate valve for drinking water and neutral liquids to max. 70°C.
- For AS/NZS 4020 compliance, max temp 40°C .

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.
- Face-to-face dimension according to AS2638.2.
- 1 Flange drilling to AS/NZS 4087 B5.
- 2 Flange drilling: AS 2129 E.

Additional information

- For general information, datasheets, certificates, drawings and IOM guide open below link;

1 ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

1 CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

2 ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

2 CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated gate valves (spigot) PN16

DN	Product codes	
	Anti-clockwise closing	Clockwise closing
80	C524.08	C524.08C
100	C524.10	C524.10C
150	C524.15	C524.15C
200	C524.20	C524.20C
225	C524.22	C524.22C
250	C524.25	C524.25C
300	C524.30	C524.30C

Product Description

- Gate valve for drinking water and neutral liquids to max. 70°C.
- For AS 4020 compliance, max temp 40°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.
- Spigot ends to AS/NZS 2280 Figure H17.

Additional Information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated gate valves PN16 with PE100 pipe ends

DN PE - OD	Product codes	
	Anti-clockwise closing	Clockwise closing
90	C527.90PE	C527.90PEC
110	C527.110PE	C527.110PEC
125	C527.125PE	C527.125PEC
140	C527.140PE	C527.140PEC
160	C527.160PE	C527.160PEC
180	C527.180PE	C527.180PEC
200	C527.200PE	C527.200PEC
225	C527.225PE	C527.225PEC
250	C527.250PE	C527.250PEC
280	C527.280PE	C527.280PEC
315	C527.315PE	C527.315PEC

Product description

- Gate valve fitted with PE 100 pipe for water, sewage and neutral liquid applications to max. 70°C.
- For AS/NZS 4020 compliance, max temp 40°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK SUPA PLUS - Resilient seated gate valves PN16 – Comes with tensile resistent socket ends*

DN PE - OD	Product codes Anti-clockwise closing	Clockwise closing
90	C5261.090PE	C5261.090PEC
110	C5261.110PE	C5261.110PEC
125	C5261.125PE	C5261.125PEC
140	C5261.140PE	C5261.140PEC
160	C5261.160PE	C5261.160PEC
180	C5261.180PE	C5261.180PEC
200	C5261.200PE	C5261.200PEC
225	C5261.225PE	C5261.225PEC
250	C5261.250PE	C5261.250PEC
280	C5261.280PE	C5261.280PEC
315	C5261.315PE	C5261.315PEC

* Compliance to AS/NZS 4129 requires the use of a series 05 support bush to be fitted to the PE end when using SUPA PLUS™ fittings and valves.

Product description

- SUPA PLUS™ tensile resistant socket end gate valve for drinking water and other neutral liquids to max. 70°C.
- For AS/NZS 4020 compliance max temp is 40°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 2638.2.
- Compliance to AS/NZS 4129 requires the use of a series 05 support bush to be fitted to the PE end when using SUPA PLUS™ fittings and valves.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

ACC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

CC AVK GATE VALVE, RESILIENT SEATED, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK support bush, wedge type for use with PE pipes

Fitting size (PE)* mm	Nominal size mm	SDR mm	Product code
110	100	17	C05011017
110	100	11	C05011011
110	100	13.6	C050110136
125	125	17	C05012517
125	125	11	C05012511
125	125	13.6	C050125136
140	125	17	C05014017
140	125	11	C05014011
140	125	13.6	C050140136
160	150	17	C05016017
160	150	11	C05016011
160	150	13.6	C050160136
180	175	17	C05018017
180	175	11	C05018011
180	175	13.6	C050180136
200	200	17	C05020017
200	200	11	C05020011
200	200	13.6	C050200136
225	225	17	C05020017
225	225	11	C05020011
225	225	13.6	C050225136
250	250	11	C05025011
250	250	13.6	C050250136
280	275	17	C05028017
280	275	11	C05028011
280	275	13.6	C050280136
315	300	17	C05031517
315	300	11	C05031511
315	300	13.6	C050315136
355	350	17	C05035517
355	350	11	C05035511
400	400	17	C050355136
400	400	11	C05040011
400	400	13.6	C050400136
450	450	17	C05040017
500	500	17	C05050017
500	500	11	C05050011
630	600	17	C05063017
630	600	11	C05063011

* For sizes not listed above contact Iplex.

Product description

- Support bush for PE pipes.
- AVK recommends usage of a support bushes in PE pipes when using a tensile coupling or flange adaptor such as an AVK combi-flange and a Supa Plus™ or Supa Maxi™ coupling. AVK support bushes are made of stainless steel AISI 304 and are available for SDR 11, SDR 13,6, SDR 17 and SDR 17,6 PE pipes. For pipes in rolls, AVK recommends using support bushes in order to ensure correct chamfering and restore the roundness of the pipe.

Features

- Support bush is manufactured from stainless steel AISI 304.
- In order to prevent corrosion, the support bush is pickled and passivated.
- Standard sizes are SDR 11, SDR 13.6, SDR 17 and SDR 17.6. Other SDR sizes are available on request.
- Available for PE pipes DN 50 - DN 400. Other DN sizes are available on request.

Additional information

For general information, datasheets and IOM guide open below link;

AVK Support Bush, Wedge Type - AVK Australia Civil (avkcivil.com.au)

AVK resilient seated swing check valve (flanged) PN16

DN	Product codes	
	Flange drilling to AS/NZS 4087 B5	Flange drilling to AS 2129 E
80	C55331.08	-
100	C55331.10	C55331.10E
150	C55331.15	C55331.15E
200	C55331.20	C55331.20E
250	C55331.25	C55331.25E
300	C55331.30	C55331.30E

General Note: Accessories available as per below.
If required contact Iplex.

- Lever and weight.
- Limit/proximity switch and cam.
- Safety protection guard according to AS/NZS 4024.

Product description

- Check valve for water and other neutral liquids to max. 60°C.

Standards

(open below link to check certification status.)

- Designed to: AS 4794.
- Face to face: AS 4794.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

AS/NZS 4087 B5 - AVK SWING CHECK VALVE, RESILIENT SEATED - AVK Australia Civil (avkcivil.com.au)

AS 2129 E - AVK SWING CHECK VALVE, RESILIENT SEATED - AVK Australia Civil (avkcivil.com.au)

AVK spring hydrant, PN16

DN*	Product codes	
	Blue top	Lilac top
80	C141.08	C141.08P
100	C141.10	C141.10P
80/100	C141.08Q[1]	

[1] 80/100 flange is slotted.

*Additional sizes are available.

If required coupling is not listed above contact Iplex.

Product description

- AVK spring hydrant for fire protection services, water and neutral liquid applications.

Standards

(open below link to check certification status.)

- Designed to: AS 3952.
- Flange drilling to AS/NZS 4087 B5.

Additional information

For general information, datasheets, certificates, drawings and IOM open below link;

AVK SPRING HYDRANT, PN16 - AVK Australia Civil (avkcivil.com.au)

AVK hydrant control valve, PN16

		Product codes	
DN	DN/DN	Anti-clockwise closing	Clockwise closing
80	80/80	C147.08	C147.08C
100	100/100	C147.10	C147.10C
80	SA		C145.08C[1]
80	NT		C1461.08[2]
100	WA		C145.08[3]

[1] SA Hydrant, PN16. Screw-Down Type, AS/NZS 4087 B5.

[2] NT Hydrant, PN16. Compact model with loose stopper for use in Northern Territory.

[3] WA Hydrant, PN16. Screw-Down Type, AS/NZS 4087 B5.

Product description

- AVK under ground hydrant for fire protection services, water and neutral liquid applications.

Standards

(open below link to check certification status.)

- Flange drilling to AS/NZS 4087 B5.
- AS/NZS 4020 compliance.
- Additional for SA hydrant: Inlet flange to AS/NZS 4087. Coating to AS/NZS 4158.
- NT hydrant specific: Face to face: BS750. Universally drilled to AS 2129 Table D, DN80/DN90. Coating to AS/NZS 4158. AS 4020 compliance.
- Additional for WA hydrant: Coating: AS/NZS 4158 / SPS292.

Additional information

For general information, datasheets, certificates, drawings and IOM guide open below link;

AVK HYDRANT ISOLATION VALVE, PN16 - AVK Australia Civil (avkcivil.com.au)

SA AVK FIRE HYDRANT, SA, PN16 - AVK Australia Civil (avkcivil.com.au)

NT AVK FIRE HYDRANT, NT, PN16 - AVK Australia Civil (avkcivil.com.au)

WA AVK FIRE HYDRANT, WA, PN16 - AVK Australia Civil (avkcivil.com.au)

Hydrant

SA Hydrant

NT Hydrant

WA Hydrant

AVK air relief valve

DN	Product codes		Product codes	
	Air release valve, ABS float, PN16	Air release valve, wastewater /sewerage, PN16	Air release valve, double orifice, flanged, PN16	Air release valve, double orifice, flanged, PN25
25	C5403.025[1]			
50			C5404.050	C5405.050F
80		C5404.080S	C5404.080	C5405.080F
100			C5404.100	C5405.100F
150			C5404.150	C5405.150F

[1] PN25 air valve available, product code C5403.025F.

Product description (Air Valve with ABS Float)

AVK air venting valves are designed for automatic discharge of accumulated air during normal working conditions. Corrosion protection is ensured by coating all ductile iron components with WRAS approved fusion bonded epoxy and having all other components made by a drinking water approved stainless steel. The seals are made of drinking water approved EPDM rubber featuring an excellent compression set. Air vent 1" female BSP thread for water and neutral liquids to max. 70°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 4158.
- Designed to: AS/NZS 4956.

Additional information

For General product information, datasheets, certificates, drawings and IOM guide open below link;

AVK AIR RELIEF VALVE, PN16 - AVK Australia Civil (avkcivil.com.au)

Product description (Sewerage)

AVK double orifice, triple action air valves are designed to be installed in waste water and sewage plants to allow air to either escape or enter the pipe system when filling or draining it, as well as for automatic discharge of accumulated air during normal working conditions. The large float chamber keeps the contaminated water at a safe distance from the valve surfaces, ensuring a continued operation with long service intervals. The unique 'Aerokinetic' design allows air to rush out of the system at great speed without forcing the float upwards and closing it prematurely. This makes sure that the valve closes only after all air has left the system and water has entered the chamber. All iron components are protected with fusion bonded epoxy coating in an approved process to ensure high durability. All other components are made of either approved polymer material or stainless steel to reduce corrosion risk even further. All seals are made of approved EPDM rubber.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 4956.
- Flange drilling to AS/NZS 4087 B5.

Additional information

For general product information, datasheets, certificates, drawings and IOM guide open below link;

AVK AIR RELIEF VALVE, PN16, WASTE WATER - AVK Australia Civil (avkcivil.com.au)

Product description (double orifice flanged)

AVK double orifice, triple action air valves are designed to allow air to rapidly either escape or enter the pipe system when filling or draining, as well as for automatic discharge of accumulated air during normal working conditions. The unique 'Aerokinetic' design allows air to rush out of the system at great speed without forcing the float upwards and closing it prematurely. This makes sure that the valve closes only after all air has left the system and water has entered the chamber. All iron components are protected with fusion bonded epoxy coating in accordance with AS/NZS 4158, to ensure high durability. All other components are made of approved polymer materials or stainless steel to reduce corrosion risk even further. Used for water and neutral liquids to max. 70°C.

Standards

(open below link to check certification status.)

- Designed to: AS/NZS 4956.
- For PN16: Flange drilling to AS/NZS 4087 B5.
- For PN25: Flange drilling: AS 2129 F.

Additional information

For general product information, datasheets, certificates, drawings and IOM guide open below link;

For PN16: AVK DOUBLE ORIFICE AIR VALVE, PN16 - AVK Australia Civil (avkcivil.com.au)

For PN25: AVK DOUBLE ORIFICE AIR VALVE, PN25 - AVK Australia Civil (avkcivil.com.au)

AVK butterfly valve, concentric, PN16

DN	Product codes	
	Double FL, Lever handle operated, PN16	Double FL, Gear operated, PN16
80	C5858.08L	C5858.08G
100	C5858.10L	C5858.10G
150	C5858.15L	C5858.15G
200	-	C5858.20G
250	-	C5858.25G
300	-	C5858.30G
350	-	C5858.35G
400	-	C5858.40G
450	-	C5858.45G
500	-	C5858.50G

Product description

- Valves are Double Flanged, Loose Replaceable Liner, lever handle operated or gear operated, AS/NZS 4087 B5.
- They are StandardsMark certified to AS 4795.2. Also, the valves are designed with a square driven anti-blowout shaft and slim disc of acid resistant stainless steel.
- Suitable for water and neutral liquid applications.

Standards

(open below link to check certification status.)

- Face to face: AS 4795.2.
- Flange drilling to AS/NZS 4087 B5.

Additional

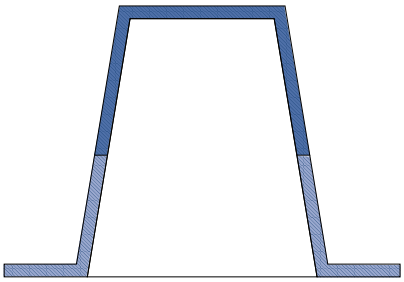
For general product information, datasheets, certificates, drawings and IOM guide open below link;

Lever: AVK BUTTERFLY VALVE, CONCENTRIC, PN16 - AVK Australia Civil (avkcivil.com.au)

Gear: AVK BUTTERFLY VALVE, CONCENTRIC, PN16 - AVK Australia Civil (avkcivil.com.au)

Valve covers – Gate "sluice" and surrounds

Region	Code	Description
QLD	GM300SVLQ	Valve box and surround (complete)
	C9722.10	Plastic surround
	C9722.04	Concrete surround
NSW	C9723.PSVY	Valve box and surround (complete)
VIC	C9723.01	Valve box and CI cover (complete)
	C9711.13	Valve box grey round surround and CI lid (complete)
	C9723.VSSM	Valve surround
SA	C9710.5680006	Cover Lid Chamber
	C9710.56800065	Concrete ring
	C9710.56800061	
	C9710.56800049	
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.

Hydrant covers and surrounds

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

Note: For other state specific covers, contact Iplex.

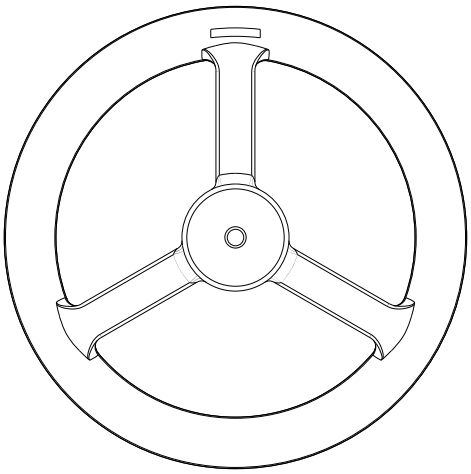
Valve extension spindles

Valve size DN	Product codes galvanised steel	Extension length (mm)
80 - 500	C590.150G	150
80 - 500	C590.225G	225
80 - 500	C590.300G	300
80 - 500	C590.375G	375
80 - 500	C590.450G	450
80 - 500	C590.600G	600
80 - 500	C590.750G	750

Note: Other fabricated valve extension spindles and valve keys available.

Hand wheels

Valve size DN	Product codes	
	Anti-clockwise ACC closing	Clockwise CC closing
PN16 rated		
50 - 100	C5921.0510L	C5921.0510LC
150	C5921.15L	C5921.15LC
200	C5921.20L	C5921.20LC
225 - 300	C5921.2230L	C5921.2230LC
PN25 rated		
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

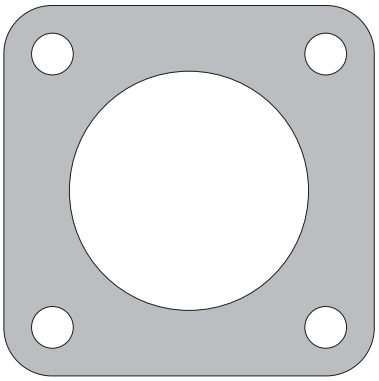


* PN35 and Table E available upon request.

Square gasket sets

DN	Product codes		Size x length of bolts [mm]
	EPDM square gaskets with galvanized bolt sets[1]	EPDM square gaskets with 316 s/s bolt sets[1]	
80	C901.08SQ	C902.08SQ	M16x65
100	C901.10SQ	C902.10SQ	M16x75

[1] Rated at PN16.



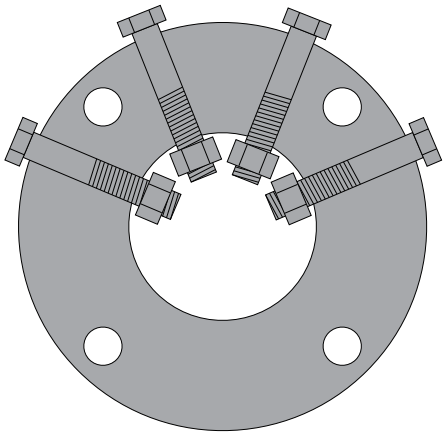
Gasket and bolt sets

DN	Product codes		Size x length of bolt [mm]
	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	M16x65
100	C901.10	C902.10	M16x75
150	C901.15	C902.15	M16x75
200	C901.20	C902.20	M16x90
225	C901.22	C902.22	M16x90
250	C901.25	C902.25	M20x90
300	C901.30	C902.30	M20x100
375	C901.37	C902.37	M24x120
450	C901.45	C902.45	M24x120
500	C901.50	C902.50	M24x120
600	C901.60	C902.60	M27x130
750	C901.75	C902.75	TBC

[1] Rated at PN16.

PN35 and Table E available upon request.

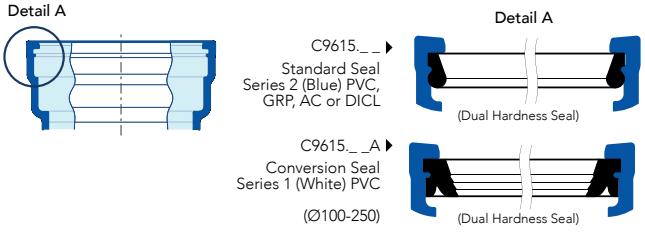
Full face kit



Standard DI socket seals and conversion seals (series 2 to series 1 sizes)

DN	Product codes	
	DI socket seals series 2	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	-

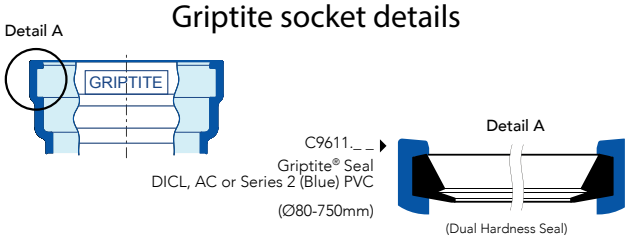
Standard DI socket details



Griptite socket seals

DN	Product code Griptite socket seals 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

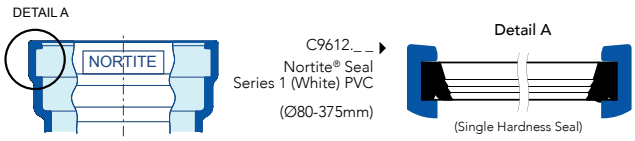
Griptite socket details



Nortite socket seals

DN	Product code Griptite socket seals series 1 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
575	C9611.57

Nortite socket details



AVK SS repair clamps for rigid pipe, NBR seal, PN16+

		Iplex product codes				
		Clamp length*				
DN*	Clamp sealing range (mm)*	150	200	300	400	600
50	59-64	C3701.05915		C3701.05930		
50	69-74	C3701.06915		C3701.06930		
50	75-80		C3701.07520	C3701.07530		
65	76-83	C3701.07615WA				
65	79-84				C3701.07940	
80	75-80	C3701.07515				
80	85-92		C3701.08520			
80	88-95	C3701.08815	C3701.08820	C3701.08830		
80	95-102	C3701.09515WA				
80	95-105		C3701.09520	C3701.09530	C3701.09540	
100	110-120		C3701.11020	C3701.11030	C3701.11040	
100	114-124		C3701.11420	C3701.11430		
100	120-130		C3701.12020	C3701.12030	C3701.12040	C3701.12060
100	130-140		C3701.13020	C3701.13030		
100	140-150		C3701.14020			
125	140-150			C3701.14030	C3701.14040	
125	145-155				C3701.14540	
150	150-160		C3701.15020	C3701.15030		
150	160-170		C3701.16020	C3701.16030	C3701.16040	
150	175-185		C3701.17520	C3701.17530	C3701.17540	
150	190-200		C3701.19020	C3701.19030	C3701.19040	
200	200-210		C3701.20020	C3701.20030	C3701.20040	
200	210-220		C3701.21020			
200	215-225		C3701.21520	C3701.21530	C3701.21540	
200	225-235		C3701.22520	C3701.22530		C3701.22560
200	230-240		C3701.23020[1]	C3701.23030	C3701.23040	
200	245-255				C3701.24540	
225	245-255			C3701.24530[3]		C3701.24560
225	250-260			C3701.25030[1]		C3701.25060
225	255-260			C3701.25530	C3701.25540	
250	270-280			C3701.27030	C3701.27040	
250	275-285			C3701.27530		
250	280-290			C3701.28030		

AVK SS repair clamps for rigid pipe, NBR seal, PN16+ continued

		Iplex product codes				
		Clamp length*				
DN*	Clamp sealing range (mm)*	150	200	300	400	600
250	285-295		C3701.28520[2]	C3701.28530	C3701.28540	
300	310-320			C3701.31030	C3701.31040	
300	315-325			C3701.34030		C3701.32060
300	340-350			C3701.34030		
300	330-350				C3702.33040	C3702.33060
300	340-360				C3702.34040	
300	350-370				C3702.35040	
350	360-380				C3702.36040	
350	370-390				C3702.37040	
350	380-400				C3702.38040	
375	385-405				C3702.38540	
375	390-410				C3701.39040	
375	400-420				C3702.40040	
375	410-430				C3702.41040	C3702.41060
375	440-460					C3702.44060
400	440-460				C3702.44040	
450	490-510				C3702.49040	C3702.49060
500	560-580				C3702.56040[2]	C3702.56060[2]
525	570-590				C3702.57040WA[2]	
600	610-630				C3702.61040[4]	
600	620-650				C3702.62640	
600	650-680				C3702.65040	C3702.65060

+ Clamp allowable operating pressure may be lower than PN16. Liaise with Iplex for confirmation.

*Additional dimensions and lengths are available. If required clamp is not listed above contact Iplex.

[1] Available in PN12 or PN16

[2] Available PN10 only

[3] Available PN12 only

[4] Available PN6 only

Product description

- Repair clamp, AISI 316 Stainless Steel manufactured by AVK Wang, for water and neutral liquids to max. 60°C.
- For pipelines used in water reticulation, sewage, wastewater and irrigation.
- AVK repair clamps ensure a cost effective and reliable solution for quick repairs on Cast Iron, Ductile Iron, Steel, PVC-U, PVCM, AC and Copper pipes. A pipe with a hole, crack or full fracture will be repaired permanently. The stainless steel repair clamps are passivated in order to ensure an optimum corrosion resistance.
- Suitable for PVC-U and PVC-M with a stiffness rating higher than 10.

Standards

(open below link to check certification status)

- StandardsMark AS 4181-2013 to DN 300.

Additional information

For general product information, datasheets, certificates, drawings and IOM Guide open below link;

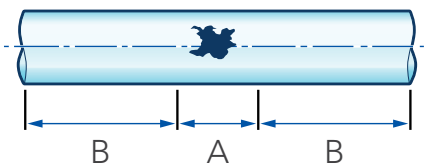
AVK REPAIR CLAMP, DN40-DN1100 - AVK Australia Civil (avkcivil.com.au)

Selection clamp length

It is important that there is sufficient contact between the edge of the area to be repaired and the end of the clamp. The following table gives a guide to the recommended minimum for sealing dimension "B" in the diagram.

Minimum required seal length 'B'

Nom. pipe diameter DN	Minimum seal length 'B' mm	Standard clamp lengths mm
40-80	50	150
100-200	65	200
225-300	100	300
350-600	150	400



Minimum clamp length = A + 2B

AVK repair clamp, HDPE. Repair clamp for HDPE pipe, NBR seal, PN16 to DN500

DN*	Clamp sealing range (mm)*	Iplex product codes	
		Clamp length*	
		300	400
150	175-185	C3711.12530	
150	175-185	C3711.18030	
250	260		C3711.25040

*Additional dimensions and lengths are available. If required clamp is not listed above contact Iplex.

Product description

- Repair clamp in AISI 316 stainless steel manufactured by AVK WANG for water and neutral liquids to max. 60°C.
- AVK repair clamps ensure a cost effective and reliable solution for quick repairs on HDPE pipes. A pipe with a hole, crack or full fracture will be repaired permanently. The stainless steel repair clamps are passivated in order to ensure an optimum corrosion resistance.
- For pipeline used in water reticulation, sewage, wastewater and irrigation.
- Blue coloured locking plate to identify use on HDPE.
- 16 bar allowable operating pressure to DN500.
- Pipes must be high density and rated SDR 13.6 or greater to ensure sealing.
- This product does not provide axial restraint and must not be used to join pipe.

Standards: (open below link to check certification status) Hydraulic test 1.5 x PN.

Additional information

For general product information, datasheets, certificates, drawings and IOM guide open below link;

AVK REPAIR CLAMP, HDPE, DN50-DN1000 - AVK Australia Civil (avkcivil.com.au)

AVK SS repair clamps for rigid pipe, NBR seal, PN16+

DN*	Clamp sealing range (mm)*	Iplex product codes										
		Clamp length (mm) and BSP tapping DN*										
		150L	150L	200L	200L	200L	200L	200L	300L	300L	300L	300L
		20mm BSP	25mm BSP	20mm BSP	25mm BSP	32mm BSP	40mm BSP	50mm BSP	20mm BSP	25mm BSP	32mm BSP	40mm BSP
80	76-83	C3705.07615T20	C3705.07615T25									
80	85-92			C3705.08820T20	C3705.08820T25	C3705.08820T32		C3705.08820T50				
80	88-95											
80	95-105			C3705.09520T20					C3705.09530T20			
100	110-115											
100	110-120			C3705.11020T20	C3705.11020T25	C3705.11020T32	C3705.11020T40	C3705.11020T50		C3705.11030T25		
100	114-124			C3705.11420T20	C3705.11420T25			C3705.11420T50				
100	120-130			C3705.12020T20	C3705.12020T25	C3705.12020T32	C3705.12020T40	C3705.12020T50	C3705.12030T20	C3705.12030T25		C3705.12030T40
100	120-125											
100	130-140			C3705.13020T20	C3705.13020T25	C3705.13020T32						
100	140-150			C3705.14020T20	C3705.14020T25		C3705.14020T40	C3705.14020T50				
150	150-160				C3705.15020T25	C3705.15020T32	C3705.15020T40	C3705.15020T50				
150	160-170			C3705.16020T20	C3705.16020T25	C3705.16020T32	C3705.16020T40	C3705.16020T50				
150	175-185			C3705.17520T20	C3705.17520T25	C3705.17520T32	C3705.17520T40	C3705.17520T50		C3705.17530T25		
150	190-200								C3705.19030T20			C3705.19030T40
200	200-210								C3705.20030T20	C3705.20030T25		C3705.20030T40
200	215-225			C3705.21520T20	C3705.21520T25	C3705.21520T32	C3705.21520T40	C3705.21520T50		C3705.21530T25		
200	225-235								C3705.22530T20	C3705.22530T25		
200	230-240			C3705.23020T20					C3705.23030T20	C3705.23030T25		C3705.23030T40
225	250-260								C3705.25030T20	C3705.25030T25		
225	255-265									C3705.25530T25		
250	285-295								C3705.28530T20	C3705.28530T25	C3705.28530T32	C3705.28530T40
300	310-320								C3705.31030T20			
300	330-350											
300	340-350											
300	350-370											
300	360-380											
375	390-410											
375	410-430											
400	440-460											
450	490-510											
450	530-550											
500	560-580											
500	570-590											
600	610-630											
600	650-670											
750	820-860											

+ Clamp allowable operating pressure may be **lower than PN16**. Liaise with Iplex for confirmation.
*Additional dimensions and lengths are available. If required clamp is not listed above contact Iplex. Clamps available DN50 -DN1200 with offtake sizes DN20 - DN100 depending on host pipe size.

AVK SS repair clamps for rigid pipe, NBR seal, PN16+ continued

DN*	Clamp sealing range (mm)*	Iplex product codes											
		Clamp length (mm) and bsp tapping DN*											
		300L	300L	300L	300L	400L	400L	400L	400L	400L	400L	600L	600L
		50mm BSP	65mm BSP	80mm BSP	100mm BSP	20mm BSP	25mm BSP	32mm BSP	40mm BSP	50mm BSP	80mm BSP	25mm BSP	50mm BSP
80	76-83												
80	85-92												
80	88-95	C3705.08830T50											
80	95-105												
100	110-115		C3705.11030T65	C3705.11030T80									
100	110-120												
100	114-124												
100	120-130	C3705.12030T50				C3705.12040T20							
100	120-125		C3705.12030T65	C3705.12030T80									
100	130-140												
100	140-150												
150	150-160												
150	160-170			C3705.16030T80									
150	175-185	C3705.17530T50	C3705.17530T65		C3705.17530T10	C3705.17540T20				C3705.17540T50			
150	190-200	C3705.19030T50											
200	200-210	C3705.20030T50	C3705.20030T65	C3705.20030T80	C3705.21030T100								
200	215-225	C3705.21530T50		C3705.21530T80	C3705.21530T100								
200	225-235												
200	230-240	C3705.23030T50	C3705.23030T65	C3705.23030T80	C3705.23030T10								
225	250-260	C3705.25030T50			C3705.25030T10								
225	255-265	C3705.25530T50	C3705.25530T65										
250	285-295	C3705.28530T50		C3705.28530T80									
300	310-320												
300	330-350					C3705.33040T20	C3705.33040T25		C3705.33040T40	C3705.33040T50			
300	340-350	C3705.34030T50											
300	350-370									C3705.35040T50			
300	360-380						C3705.36040T25						
375	390-410									C3705.36040T50			
375	410-430						C3705.41040T25	C3705.41040T32	C3705.41040T40	C3705.41040T50	C3705.41040T80		
400	440-460					C3705.44040T20	C3705.44040T25			C3705.44040T50			
450	490-510					C3705.49040T20	C3705.49040T25	C3705.49040T32	C3705.49040T40	C3705.49040T50			
450	530-550					C3705.53040T20			C3705.53040T40	C3705.53040T50			
500	560-580						C3705.56040T25	C3705.56040T32	C3705.56040T40	C3705.56040T50	C3705.56040T80		
500	570-590						C3705.57040T25			C3705.57040T50			
600	610-630					C3705.61040T20				C3705.61040T50	C3705.61040T80		
600	650-670					C3705.65040T20	C3705.65040T25	C3705.65040T32		C3705.65040T50	C3705.65040T80		
750	820-860											C3705.82040T25	C3705.82040T50

+ Clamp allowable operating pressure may be **lower than PN16**. Liaise with Iplex for confirmation.
* Additional dimensions and lengths are available. If required clamp is not listed above contact Iplex. Clamps available DN50 -DN1200 with offtake sizes DN20 - DN100 depending on host pipe size.

Product description

- Tapped Offtake Clamp, AISI 316 Stainless Steel manufactured by AVK Wang, for water and neutral liquids to max. 60°C.
- For pipelines used in water reticulation, sewage, wastewater and irrigation.
- AVK tapped clamps ensure a cost effective and reliable solution for tapping under pressure on cast iron, ductile iron, steel, PVC-U, PVC-M, AC and copper pipes.
- Suitable for PVC-U and PVC-M with a stiffness rating higher than 10.

Standards: (open below link to check certification status)

- StandardsMark approved to AS 4181.
- WaterMark approved to AS 4181.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK TAPPED OFFTAKE CLAMP, DN40-DN900 - AVK Australia Civil (avkcivil.com.au)

AVK SS flanged offtake clamps for rigid pipe, NBR seal, AS/NZS 4087 B7, PN16+

DN*	Clamp sealing range (mm)*	Iplex product codes Clamp length (mm) and flange DN*									
		400L	400L	400L	400L	600L	600L	600L	600L	800L	800L
		80 FL	100FL	150FL	200FL	150FL	200FL	225FL	250FL	200FL	300FL
100	110-115		C3707.11040F10								
100	120-125	C3707.12040F08									
150	160-170		C3707.16040F10								
150	175-185	C3707.17540F08									
200	200-210	C3706.20040F08	C3706.20040F10	C3706.20040F15							
200	210-220		C3706.21040F10								
200	215-225	C3706.21540F08	C3706.21540F10	C3706.21540F15							
200	230-240	C3706.23040F08	C3706.23040F10	C3706.23040F15	C3706.23060F20						
225	250-260	C3706.25040F08	C3706.25040F10	C3706.25040F15			C3706.25060F20	C3706.25060F22			
250	275-285	C3706.27540F08	C3706.27540F10	C3706.27540F15			C3706.27560F20				
250	285-295	C3706.28540F08	C3706.28540F10	C3706.28540F15			C3706.28560F20	C3706.28560F22	C3706.28560F25		
300	310-320	C3706.31040F08	C3706.31040F10	C3706.31040F15			C3706.31060F20	C3706.31060F22	C3706.31060F25		
300	320-330	C3706.32040F08	C3706.32040F10	C3706.32040F15							
300	330-340	C3706.33040F08	C3706.33040F10	C3706.33040F15			C3706.33060F20	C3706.33060F22	C3706.33060F25		C3706.34060F30
300	340-350		C3706.34040F10	C3706.34040F15							
300	350-360	C3706.35040F08	C3706.35040F10	C3706.35040F15							
300	360-370		C3706.36040F10				C3706.36060F20				
375	410-420	C3706.41040F08	C3706.41040F10	C3706.41040F15			C3706.41060F20	C3706.41060F22	C3706.41060F25		
375	440-450						C3706.44060F20		C3706.44060F25		
450	440-450	C3706.44040F08	C3706.44040F10	C3706.44040F15							
450	490-500	C3706.49040F08	C3706.49040F10	C3706.49040F15			C3706.49060F20	C3706.49060F22			
450	530-540						C3706.53060F20				
500	530-540	C3706.53040F08	C3706.53040F10	C3706.53040F15							
500	560-570	C3706.56040F08	C3706.56040F10	C3706.56040F15			C3706.56060F20		C3706.56060F25		
600	610-620		C3706.61040F10	C3706.61040F15							
600	630-640			C3706.63040F15							
600	650-660	C3706.65040F08	C3706.65040F10	C3706.65040F15			C3706.65060F20		C3706.65060F25		
600	690-700		C3706.69040F10				C3706.69060F20				
675	780-790					C3706.78060F15					
750	820-830									C3706.82060F20	

+ Clamp allowable operating pressure may be **lower than PN16**. Liaise with Iplex for confirmation.
* Additional dimensions and lengths are available. If required clamp is not listed above contact Iplex. Clamps available DN100 -DN1000 with offtake sizes DN80 - DN300.

Product description

- Flanged Clamp, AISI 316 Stainless Steel manufactured by AVK Wang, for water and neutral liquids to max. 60°C.
- For pipelines used in water reticulation, sewage, wastewater and irrigation.
- AVK tapped clamps ensure a cost effective and reliable solution for tapping under pressure on Cast Iron, Ductile Iron, Steel, PVC-U, PVC-M, AC and Copper pipes.
- Suitable for PVC-U and PVC-M with a stiffness rating higher than 10.

Standards

(open below link to check certification status)

- StandardsMark approved to AS 4181.
- WaterMark approved to AS 4181.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK FLANGED OFFTAKE CLAMP, DN100-DN1000 - AVK Australia Civil (avkcivil.com.au)

AVK SS sewer OB Junction clamps for rigid pipe, 45° PVC offtake, NBR seal, PN1

DN*	Clamp sealing range (mm)*	Iplex Product codes	
		Clamp length (mm) and OB DN*	
		300L	400L
		110 OB	160 OB
150	160-170	C3708.16030B10	C3708.16040B15
150	175-185	C3708.17530B10	C3708.17540B10
150	190-200	C3708.19030B10	C3708.19040B10
200	225-235	C3708.22530B10	C3708.22540B15
225	245-255	C3708.24530B10	C3708.24540B15
225	255-265	C3708.25530B10	C3708.25540B15
225	275-285	C3708.27530B10	
250	275-285		C3708.27540B15
300	345-355		C3708.34540B15
300	360-370		C3708.36040B10
375	400-410		C3708.40040B15
400	400-410	C3708.40030B10	

* Additional dimensions and lengths are available. If required clamp is not listed above contact Iplex.
* Clamps available DN100 -DN525.

Product description

- Flanged Clamp, AISI 316 Stainless Steel manufactured by AVK Wang, for water and neutral liquids to max. 60°C.
- For pipeline used in sewage and wastewater.
- AVK sewer OB clamps are a cost effective and reliable solution ideally suited to installing a new property sewer branch or reconnecting a damaged property branch. Ideal for use on Cast Iron, Ductile Iron, Steel, PVC-U, PVC-M, FRC, VC and AC pipes. The stainless steel sewer clamps are passivated in order to ensure an optimum corrosion resistance.

Standards

(open below link to check certification status.)

- Manufactured in accordance with AS 4181.

Additional information

For General Product Information, Datasheets, Certificates, Drawings and IOM Guide open below link;

AVK SEWER OB CLAMP, DN100-DN525, PN1 - AVK Australia Civil (avkcivil.com.au)

4.0 Transportation and storage

Although ductile iron pipes and fittings are known for their mechanical strength and robust coatings, it is important to avoid pipes hitting or rubbing against each other. Pipes and fittings must 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 scalloped timber bearers, or crated packs to prevent any direct contact with the bottom of the tray. Pipes are secured and restrained with a combination of straps and chains to prevent movement during transit.

To prevent shoulder injuries, chains are to be pulled over (by straps) and not thrown over the load.

Contact Iplex for detailed load restraint application.

4.1 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) PN 35
100	21	15	190	18.1
150	10	11	128	27.4
200	12	9	100	33.55
225	6	8	83	37.56
250	9	7	71	42.46
300	6	6	53	57.33
375	4	5	38	82.37
450	4	4	28	109.41
500	2	4	24	130.25
600	2	3	18	176.52
750	2	2	12	271.87

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 must be quarantined and inspected to determine appropriate action.

Pipes must be lifted carefully off the truck in a safe and controlled manner. For an approved unloading procedure – refer to the Iplex customer safety datasheet. 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, providing 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. At all times follow safe unloading practices.

The storage site must be even, level, and stable for lifting and stacking. Stack the pipes on horizontal supporting timbers (best practice is utilising scalloped timbers) placed on the ground approximately 1500mm from each pipe end.

For subsequent layers of pipe, timbers must also be used to separate layers. The timbers used must ensure pipes do not roll.

Stack heights must be limited from a safety point of view and to prevent damage to pipes in the bottom layers. The socket and spigot ends must be placed at opposite ends with the socket protruding to prevent point loading during storage.

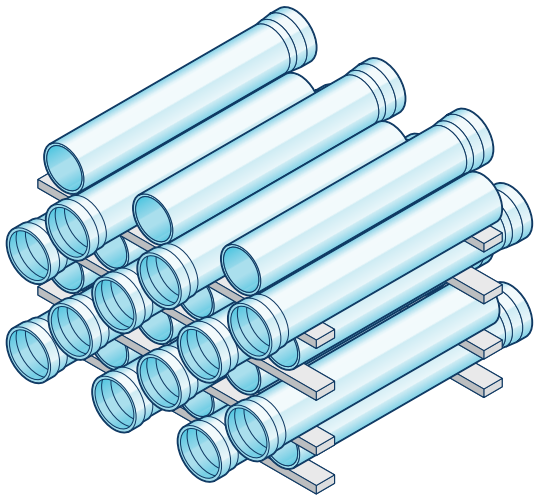
Typical stack heights

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

Note:

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

Parallel stacking



4.2 Storage - rubber rings, sleeving and lubricant

Rubber ring seals and sleeving must be stored away from direct sunlight. They must also be protected from greases, oils, solvents and other harmful substances. Storage of gaskets must be done as per Annex-D of BS EN 681-1.

Only lubricant supplied with Irontite pipe and ductile iron fittings from Iplex must be used. Other lubricant types, e.g. mineral based oils and greases can degrade and damage the rubber ring.

4.3 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 adversely affect the sealing of the joint.

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

Pipes must be lifted with inspected and tagged slings and suitable lifting attachments. Care must be taken to protect the cement lining from damage. Best practice is to employ rubber matting. Lift pipes carefully and avoid impact.

4.4 Pipe repair

If pipes are damaged, they may 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 may not be necessary. Please contact Iplex for instructions.
2. Where an area of the coating has been damaged, Please contact Iplex for instructions.
3. Any minor cement mortar lining damage may be repaired, contact Iplex for instructions.

Alternatively cutting off the damaged section may be more appropriate.

5.0 Installation of irontite ductile iron pipes

5.1 Introduction

Installation methods for ductile iron pipes are generally in accordance with AS/NZS2566 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/NZS2566.1.

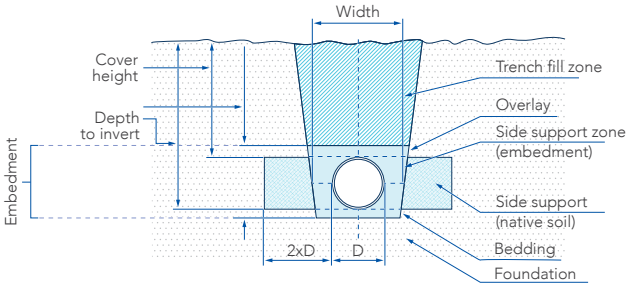
Irontite ductile iron pipes are classed as semi rigid. They provide a good compromise between resistance to soil and superimposed loading and vertical deflection providing long-term operational security. The Australian Standard AS/NZS2566 details a code of practice, which may be applied to the calculation of loads on ductile iron pipes under various installation conditions.

5.1.1 Installation in buried applications

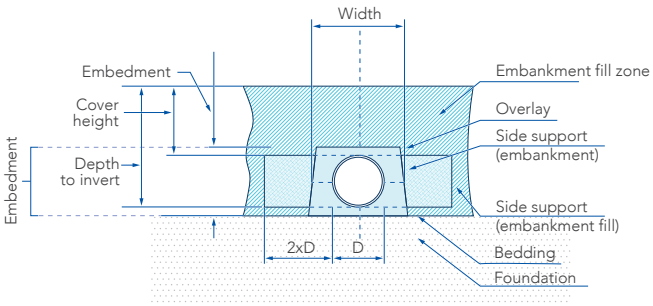
The trench width must be sufficient to allow the pipe and the joint to be properly bedded and to facilitate adequate compaction of the initial embedment material, particularly in the haunch zone. Where a slight curve in the pipeline is required, the base of the excavation must generally be widened to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

After excavation, the trench walls must remain firm and show no signs of collapse. The minimum width of the trench must 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.

5.1.2 Buried pipeline terminology



Trench



Embankment

Minimum recommended trench dimensions based on accepted practise as a guide only.[1]

(Nominal overlay and bedding thickness 100mm.)

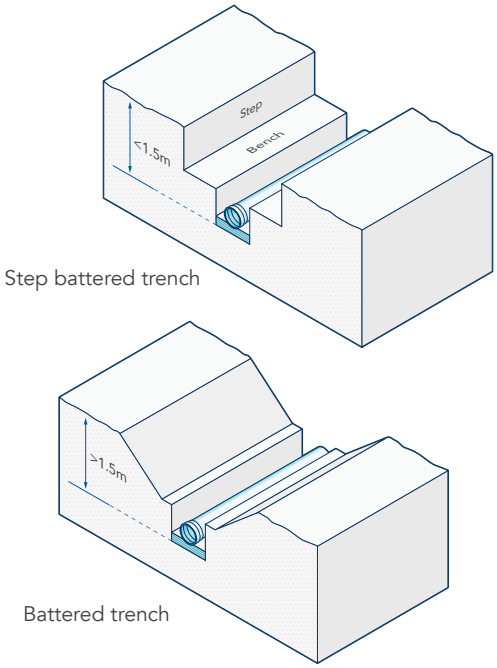
DN	Minimum trench width (mm)
100	322
150	377
200	532
225	559
250	586
300	645
375	826
450	907
500	1160
600	1267
750	1426

[1] 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.

5.1.3 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 competent person must assess the risk and manage accordingly.

Trench excavation in unstable conditions



Step battered trench

Battered trench

5.1.4 Trench depths

The minimum trench depth must 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/NZS2566.

Refer to the construction drawings and specifications, as the minimum depth could also be dependent 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

* The minimum cover heights are subject to variation by the relevant asset owner. Under cultivated agricultural land H must not be less than 600mm.

Railway crossings must comply with AS4799.

5.1.5 Foundation

The native soil in the foundation zone must be excavated to grade to permit the pipeline to be correctly aligned, allowing for bedding material of a minimum thickness of 100mm (for pipes DN100 to DN375) and 150mm (for pipes DN450 to DN750) beneath the pipe. The trench bottom must 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.

5.1.6 Embedment and backfill

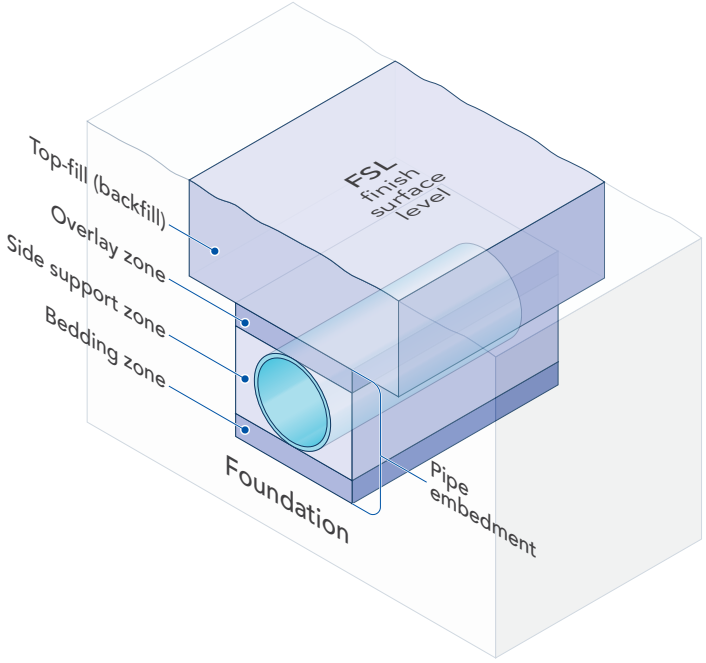
The pipe bedding must comprise of embedment material providing uniform support and load distribution along the pipe barrel as well as supporting the embedment material around the pipe.

A layer of approved granular material must be placed and compacted as specified in standard. Note that the choice of bedding must also be carefully selected so that it does not damage any corrosion protection system on the pipe. A slight depression must be formed under each socket to ensure that the complete length of the pipe barrel is evenly supported. When aligned as specified, the pipes must be on the centerline of the trench. If groundwater is present, the trench must 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 must be as smooth as possible and to grade.

5.1.7 **Embedment zones**



Top-fill (backfill)
Typically excavated material, depending on surface used. Eg. road pavement will require imported road base to surface.

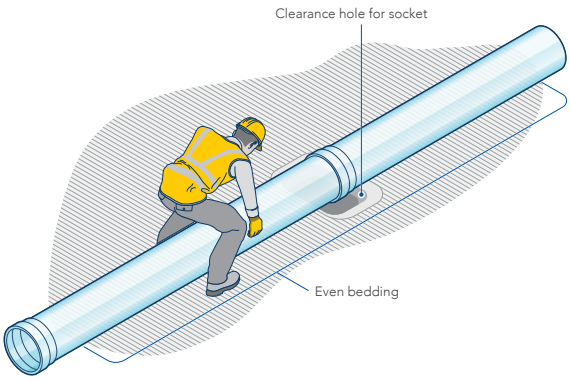
Overlay zone
Typically imported granular material, same as side support zone. THIS ZONE MUST BE STONE FREE.

Side support zone
Typically imported granular material. Compact in layers as specified.

Bedding zone
Typically imported granular material, same as side support zone.

Embedment material in the embedment zone (bedding, side support and overlay) must be non-cohesive granular material, such as sand with no sharp objects or stones. Soil clods must be excluded from the pipe embedment zone and under no circumstances must 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 must 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. It is also important to ensure that embedment material is placed carefully, in accordance with the specified standard for relative compaction, and without any voids.

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 as specified as per standard. Care must be exercised to exclude large rocks or stones from the final backfill. The trench fill must be compacted in layers to reduce the possibility of settlement over time.

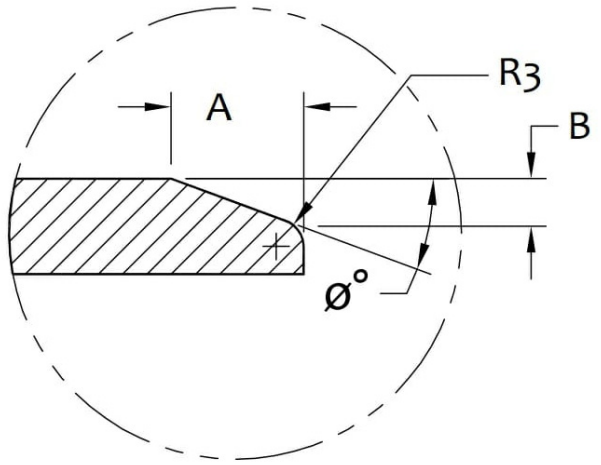
5.1.8 **Cutting**

Irontite ductile iron pipes can be cut on site for short length adjustments or connection to fittings with a secured powered cutting disc. Pipes must 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. As a minimum, wear suitable face and eye protection, inhalation protection, hearing protection, appropriate gloves for the task, safety helmet and steel capped boots at all times. Refer to your company's site-based PPE and safety requirements.

Prior to cutting, place the pipe on timber supports and chock to prevent rolling during the cutting process. Place a tape around the pipe and mark the pipe as a guide for cutting. Pipes must 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 must replicate the manufactured dimensions (see Table 5.1 for dimensions). Ensure all sharp edges are removed to prevent damage to the pipe's rubber ring seal.

The chamfered surface must be painted to reinstate the original protective coatings supplied with the pipe, typically Zn Al plus epoxy top coats. For safety information refer to the coating's safety data sheet. Contact Iplex if additional information is required.



Chamfer requirement.

Location of witness marking.

Note: All pipes ≤ DN 300 must be suitable for cutting and must have a limit of 3.5m. For pipes above DN 300, pipes must be cut only from pipes marked as "suitable for cutting" with a limit of 3.5m length from spigot side.

Table 5.1

Nominal size	A (mm)	B (mm)	L (mm)	L+T (mm)
DN100	6	1.3	68	76
DN150	9	2.2	74	82
DN200	9	2.5	85	93
DN225	9	2.5	90	98
DN250	9	2.5	94	102
DN300	9	3	105	113
DN375	9	3	110	118
DN450	9	3	108	123
DN500	9	3	123	138
DN600	9	3	123	138
DN750	15	4	133	148

5.1.9 Pipe jointing

Irontite ductile iron pipes are supplied with a 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 downstream end with the socket end facing in the upstream direction.

5.1.10 Guidelines

Inspection

Mishandling of ductile iron pipe may cause damage to lining, coatings and may create ovality in pipes. Before lowering the pipe into the trench, the following checks must be made:

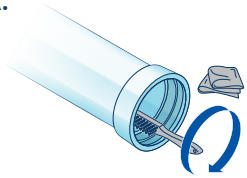
- Ovality of pipes
- Condition of cement mortar lining
- Any damage to external coating / protective coating system
- Surface condition of spigot and socket area. This must be clean and any extra paint built up removed

Any damaged pipes must be stored separately and repairs must be in accordance with guidelines provided by Iplex.

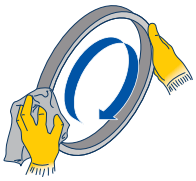
Procedure for insertion of rubber ring gasket for push-on joint

1. Using a wire brush and rag, clean the inside of socket groove where the gasket heel is to be inserted. As shown in diagrams A and B.
2. Clean the gasket. Insert into the socket ensuring the square section of the rubber ring gasket heel is in the retaining groove. If the ring is damaged in any way, it must be rejected and replaced with another ring.

A.

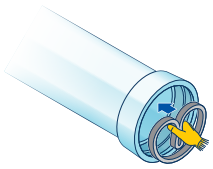


B.

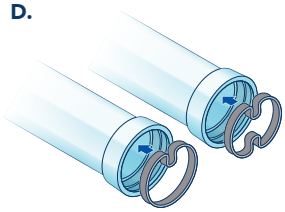


3. Using an approved pipe lubricant, lubricate the spigot end of the pipe (up to the witness mark) and the exposed surface of the rubber ring gasket.
4. **Note: Do not apply any lubricant in the socket grooves or underneath the ring and ensure the lubricated spigot does not pick up dirt, soil, or contamination when introducing the spigot into the socket.**
5. The insertion of DN 80 to DN 150 rubber ring gaskets is facilitated by turning the rubber ring gasket inside out, gripping one end and folding the free end down (to make a heart shape). As shown in diagram C.
6. The insertion of DN 200 and larger rubber ring gaskets is facilitated by folding the gasket as shown by looping it into a heart shape with the gasket bulb towards the back of the socket.
7. For DN 800 - DN 2000 it is preferable to loop the gasket into the shape of a cross for insertion. As shown in diagram D.
8. After insertion of the rubber ring gasket, confirm that the heel is properly seated in socket groove. As shown in diagram E.

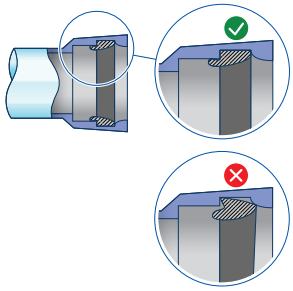
C.



D.



E.

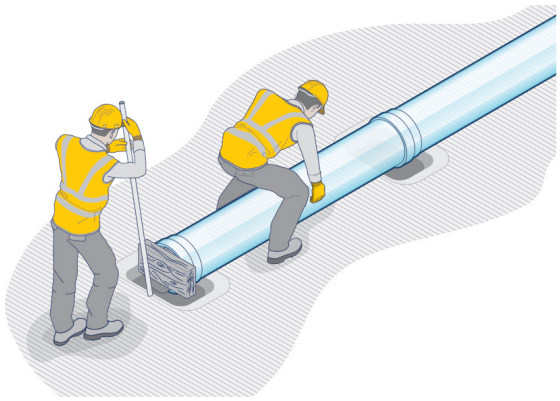


Jointing guidelines

1. Centre the spigot in the socket and keep it in this position.
2. Push the spigot into the socket, checking alignment and level. 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.
3. Jointing equipment must apply load steadily and evenly around the socket. Ensure the jointing force is applied to a suitable timber bolster. Push in the spigot until the witness mark is in line with the socket face. Do not go beyond this position.
4. The jointing of ductile iron push-on joint pipes is easily performed using crowbars, TIRFOR type winches or the bucket of a mechanical excavator. See steps below.

Crowbar method (up to DN 150)

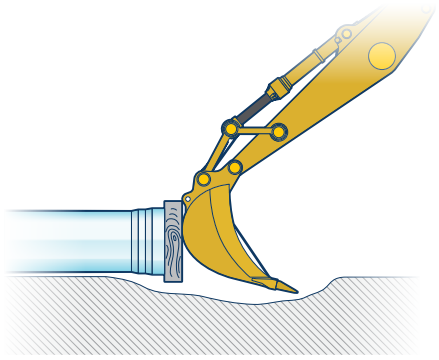
The crowbar levers against the ground. Ensure the pipe socket face is protected from the crowbar with a suitable timber bolster. The jointing is done by levering of the crowbar.

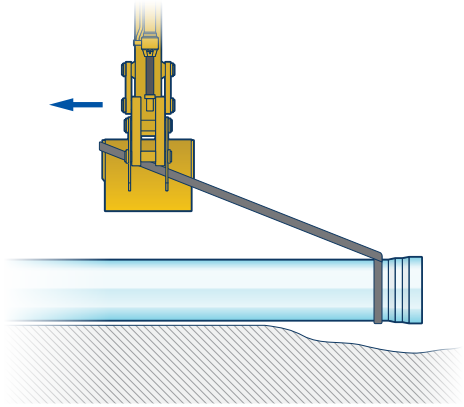


Excavator bucket (suitable for all pipe diameters)

The hydraulic force of the mechanical excavator arm can be effectively used to assemble pipes and straight fittings. However, the following precautions are to be taken:

- Between the socket and excavator bucket, place a suitable timber bolster as a protective cushion.
- Apply a load steadily and evenly around the socket.
- Follow the jointing guidelines above.

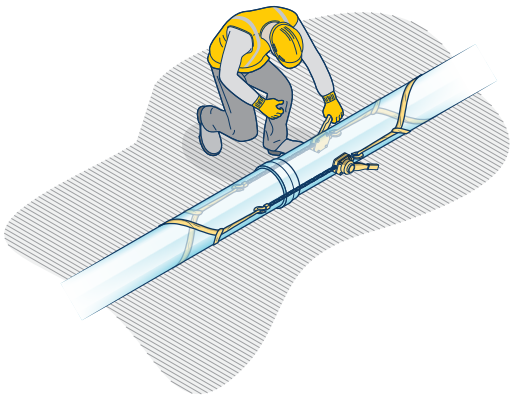




For larger diameter pipes, using the mechanical excavator bucket may not be suitable when;

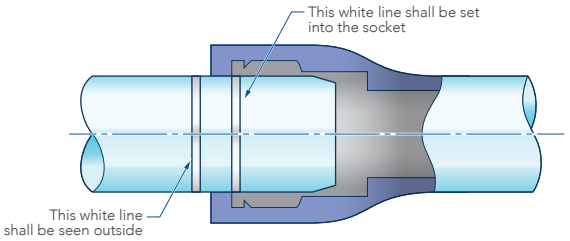
- Greater control is required to avoid over insertion of spigot into the socket.
- Alignment of pipe is a major concern.

In these circumstances, it recommended to use the chain pulley block method of jointing as per arrangement shown below:



Insertion depth of socket

The insertion depth of the spigot is indicated by two parallel witness lines located at the spigot end as shown below. Insert the pipe spigot into the socket as per the jointing guidelines on previous page. Always join pipes in a straight line and then, if required, deflect the pipe to the required angle. **Do not exceed allowable deflection angles.** Refer to Table 5.2 over page for more information.



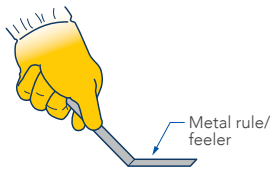
Ensure the rubber ring gasket heel is fully seated in the socket groove by applying radial pressure around its circumference.

Check and confirm pipes are aligned in a straight line before attempting to make the joint.

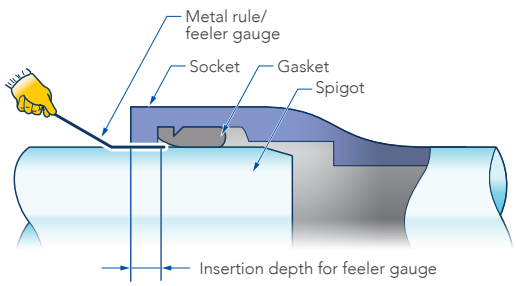
Ensure that the gasket is correctly in position by inserting the end of a metal rule (130mm to 200mm length) through the annular spigot and socket gap until it touches the gasket (see instructions below). The ruler must penetrate to the same depth around the whole circumference. **If a difference is found, the gasket may have been displaced and the joint must be dismantled and attempted again.**

Measurement procedure of the metal rule penetration depth

A metal rule/feeler gauge can be inserted between the socket and the plain end of the assembled joint to verify the position of the gasket. When the metal rule touches the gasket, increased resistance will be felt. Note the depth of insertion of the metal rule/feeler gauge. Continue probing around the periphery of the joint, checking at least 8 points (4 @ Vertical axis and 4 @ 45 deg angles), noting the depth to resistance each time.



Metal rule / feeler gauge



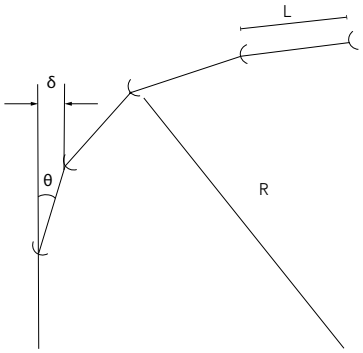
Angular deflection

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. 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.

Values given in Table 5.2 below are approximate only and must 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



Allowable deflection of Push-on joints

Where
θ = Angle of deflection
δ = Displacement in meters = L x Sin θ
R = Radius in meters = L/(2 x tan θ/2)
L = Length of each pipe in meters

5.1.11 Maximum allowable pipe joint deflection[1]

Table 5.2

Pipe diameter	Allowable deflection (per Australian standard)	Maximum allowable deflection (Jindal Saw)*
dN 100 - DN 250	3.5 Deg	4.0 Deg
DN 300 - DN 600	2.5 Deg	3.5 Deg
DN 750	1 Deg	2 Deg

*Please also note that the deflections declared are maximum and must not be exceeded.

For design purposes, deflection must be limited to 80% of the value as specified by the manufacturer (Jindal Saw) as per AWWA M41.

[1] Pipe joint deflection may be subject to local authority requirements. This must 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.

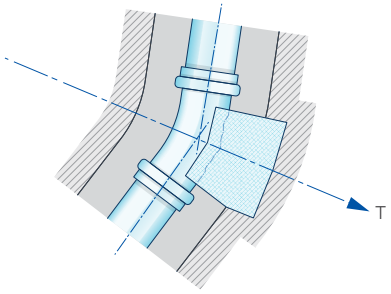
These thrust blocks are formed and sized to distribute the applied force from the fitting to a safe soil pressure at the soil/concrete interface. The resistance which can be provided, will depend on the soil type and depth.

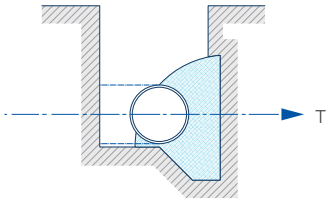
Where bends are in the vertical plane with a convex profile downwards, the weight of the concrete anchor block alone may be the restraining force.

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

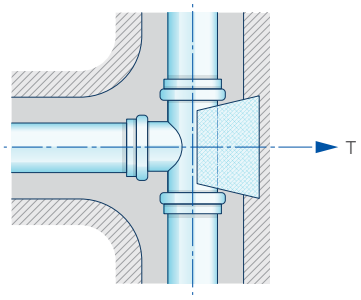
Typical thrust block configurations. As per AS/NZS2566.1 and AS/NZS2566.

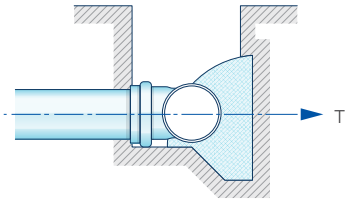
Bend in horizontal plane



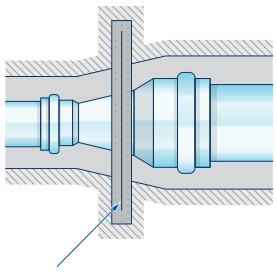


Tee anchorage

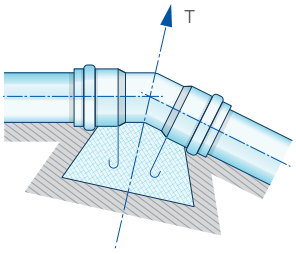




Reducer anchorage



Bend in vert



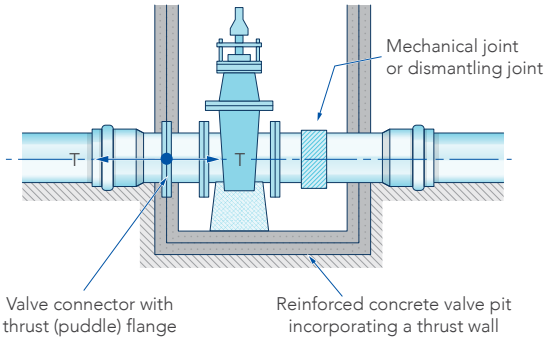


Table 5.3

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.

Table 5.4

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 perpendicular to the imposed load. The equation for this calculation is:

Equation 5

A=[T/b]×f

Where

A = the area perpendicular to the force (m2)
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 m2 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/NZS2566.2 requires the use of thrust blocks for all in-line gate valves.

Where there is risk of axial thrust, only those ductile iron fittings with full circle bearing surfaces at the base of the socket must be used. This serves to increase the effective end bearing area for the ductile iron spigot inside the ductile iron socket. **Installers must 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.

Ductile iron pipes must be anchored on steep inclines or in areas where slope instability is suspected or confirmed.

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 must be left between the spigot and the back of the socket to accommodate expansion.

A qualified geo-technical engineer must be consulted for buried pipelines installed on steep slopes and verified by the specifying consulting engineer. Ductile iron pipes may be installed on slopes 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/NZS2566.2 'Buried flexible pipelines Part 2: Installation." Common practice is the use of cement stabilised embedment around the pipe in the embedment zone.
- For steep slopes, the use of bulkheads can prevent scouring of the embedment, trench drainage and consequent trench collapse. The bulkheads must be placed at the discretion of the construction engineer and suitable drainage must pass through the bulkhead to facilitate natural drainage along the trench.
- Installation must always proceed from the low point and progress up the slope. Each length must 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 in the axial direction of the pipe must be less than 20mm.
- Stability of individual pipes must be monitored throughout the installation. This can be achieved by checking the gap between the pipe spigot and socket.

5.2 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) against aggressive soil environments

The polyethylene sleeving must be installed in accordance with the requirements specified in AS 3681 'Guidelines for the application of polyethylene sleeving to ductile iron pipelines and fittings'.

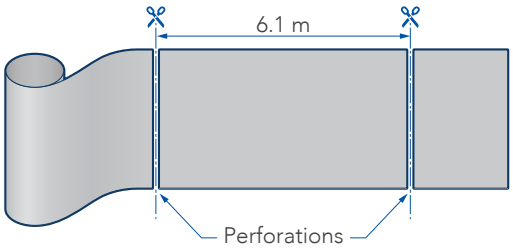
The sleeving will ensure a high degree of protection in aggressive conditions and provide greater service life.

5.2.1 Important points when sleeving Irontite pipe

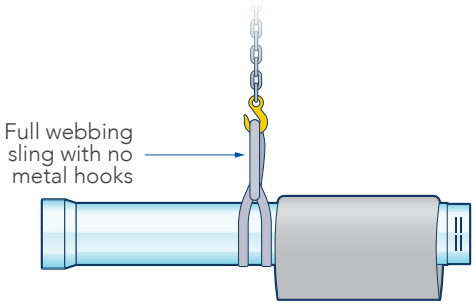
- Sleeving acts as barrier preventing pipe-soil contact.
- Choose the appropriate colour sleeving which matches the pipe application.
- Sleeving is not U.V. resistant.
- Sleeved pipe must rest on sand or sawdust bags or suitable timbers to avoid damage prior to installation.
- Sleeving is to be continuous with no gaps, holes or tears.
- 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.
- Any damaged sleeving must be repaired.

5.2.2 Installation guidelines

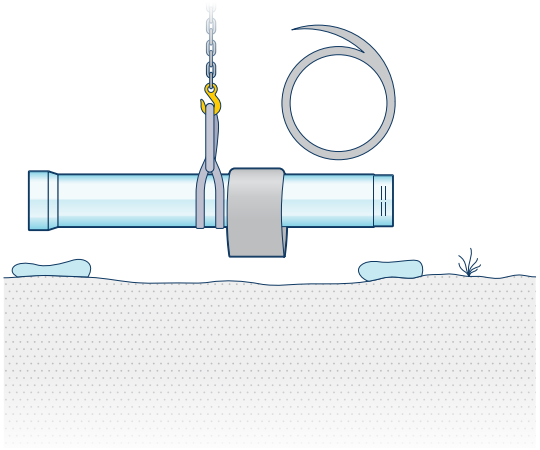
1. Prepare the site.
   a) Lifting equipment,
   b) Sand/sawdust bags,
   c) Sleeving,
   d) Tape and straps and buckles.
2. Remove single sleeve from the roll. Sleeving is perforated in 6.1m lengths for easy tear off.
3. Clean the pipe.



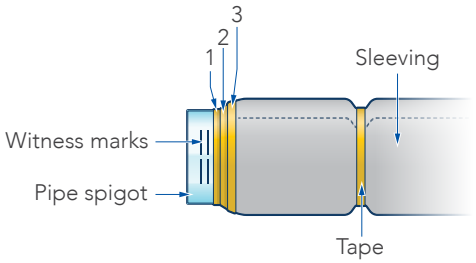
4. Pull the sleeving onto the pipe.
   a) Centralise the sling until the pipe is balanced.
   b) Pull the sleeving over the spigot end towards the sling.



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**

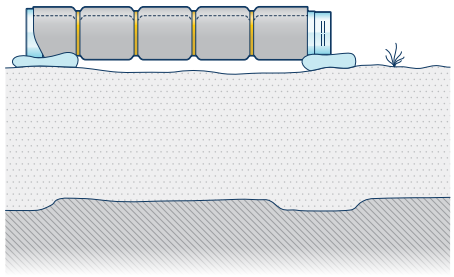
   a) Lower the pipe onto the sand/sawdust bags.

   b) Remove the sling.

   c) Pull the sleeving along the pipe towards the socket.

   d) For a snug fit make a fold on top, and 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 and to allow the sleeve to be pulled past the socket. This will facilitate the final overlap and sealing of the sleeve.



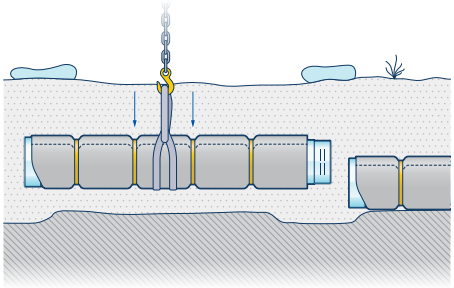
8. Lift the pipe from the centre with a sling and lower it into the trench.
9. Keep the fold of the sleeving at the top of the pipe.

   a) Joint the pipes in the normal manner.

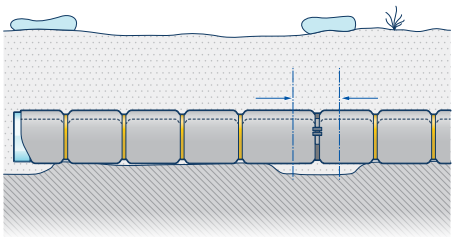
   b) Pull the bunched sleeving from behind the socket of the previous pipe over the joint (full overlap top and bottom) onto the barrel of the pipe.

   c) Avoid scooping embedment into the sleeving when drawing across the bedding depression.

   d) Make sure the sleeving follows the shape of the socket by pushing it back against the socket face.



10. Overlap the sleeving over the joint and fold it on top of pipe and secure with the strap and buckle 150mm from the sleeve end.



5.2.3 Sleeving fittings

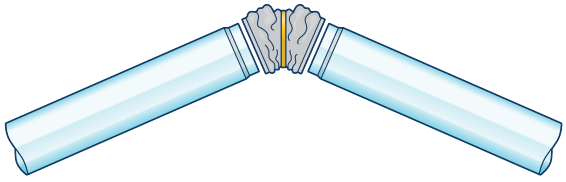
Important points with sleeving fittings:

- If fittings are not polymeric coated, then they must be sleeved.
- All fittings must be fully encapsulated (covered).
- Sleeving acts as barrier preventing fitting-soil contact.
- Choose the appropriate colour sleeving which matches the pipe application.
- Sleeving is not U.V. resistant.
- Sleeving is to be continuous with no gaps, holes or tears.
- Keep the sleeving clear of water and dirt.
- The sleeving must fit tightly.
- The sleeving must be sealed from water and soil.
- Any damaged sleeving must be repaired.

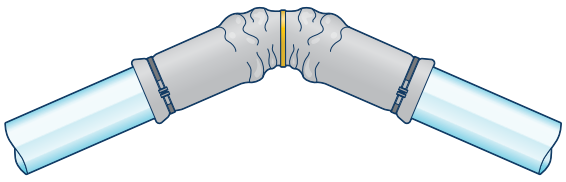
5.2.4 Installation guidelines

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.



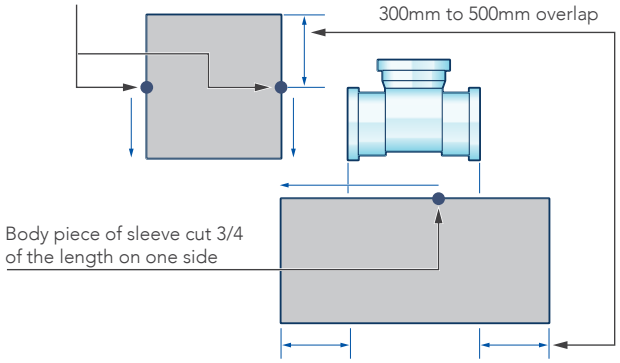
4. After joining the bend to the pipes, pull the bunched ends over the pipes and seal with straps and buckles.



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.

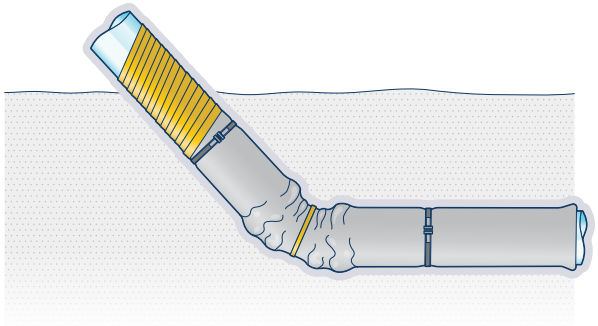


Couplings and flanges

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

Transitions

1. From below ground to above ground.
2. Do not use sleeving at the transition. It is not U.V. resistant and a line of corrosion will occur at the interface.
3. Use a suitable tape wrap system for the transition from below ground to above ground. (Check the specification or local authority for requirements)
4. 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.

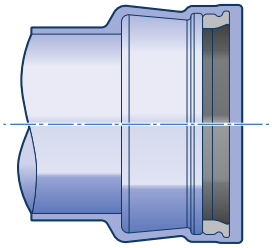
5.3 Installation of Crevet ductile fittings

The same jointing procedure used for pipes set out on page 136 can be used for the fittings. Fittings such as bends may have a jointing lug to allow the anchoring of jointing equipment.

Installation guidelines

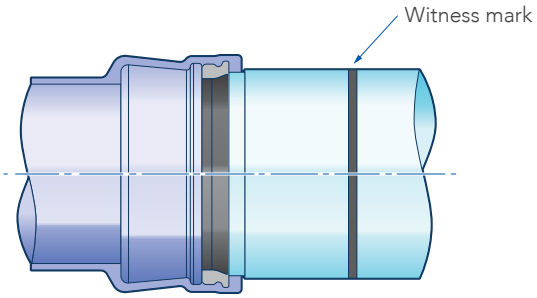
Ductile iron or PVC spigot to ductile iron socket

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.

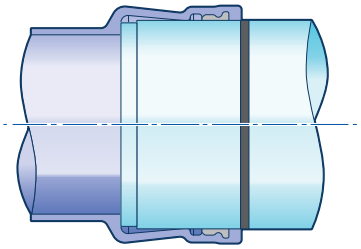
2. **Spigot:** Where a pipe needs to be cut in the field, ensure the spigot has been cut square and with a chamfer as per the manufacturer's recommendations. Remove any burrs and place a witness mark. For cut sections of pipe, the squareness and chamfer of the cut pipe will ensure ease of jointing.
3. **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.

4. **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 to restrain and aid in the jointing process.

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



5. **Jointing:** Ensure approved lubricant is applied evenly to the spigot up to the witness mark and 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 suitable timber bolster 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 must decrease significantly.

6. **Deflection:** To achieve desired pipe deflection, insert the spigot as per above steps after which the pipe needs to be pulled back slightly and then deflected. Refer to Table 5.5 for chamfer guidelines.

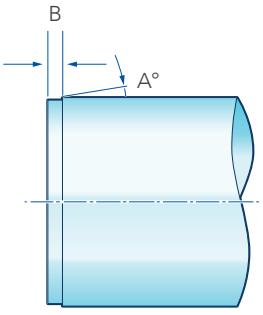
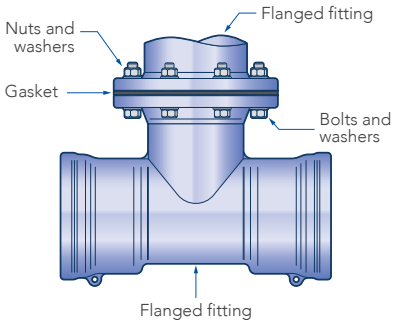


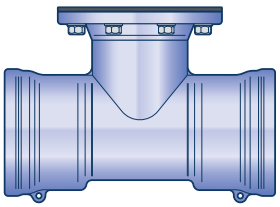
Table 5.5

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

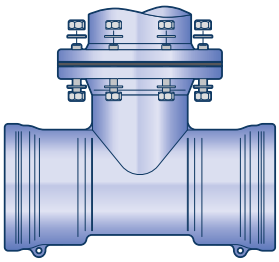
5.4 Installation guidelines flange to flange joints



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 and flange holes align evenly. Insert washers and bolts from one side and washers and nuts from the other side.



3. Tighten as per standard flange bolt tightening practice. See flange bolt tightening sequence on page 150.

Estimated tightening torque values

For standard pressure flanges per AS/NZS 4087 Figure B5 PN16 use Grade 4.6 galvanised steel bolts (GSB) and nuts or Grade 316 Class 50 stainless steel bolts (SSB) and nuts with full face gasket - 3mm rubber gasket.

Table 5.6

Tightening torque values for ductile iron flanges with a raised face flanges

Nominal size (DN)	Bolt size	Number of bolts	Bolt tension (kN)	Estimated torque (Nm)	
				Well lubricated 'GSB' μ=0.15	Well lubricated 'SSB' μ=0.20
80	M16	4	20	50	65
100	M16	4	20	50	65
150	M16	8	20	50	65
200	M16	8	25	60	80
225	M16	8	25	60	80
250	M20	8	35	105	140
300	M20	12	35	105	140
375	M24	12	50	180	240
450	M24	12	55	200	265
500	M24	16	55	200	265
600	M27	16	70	285	380
750	M30	20	80	360	480

For high pressure flanges per AS/NZS 4087 Figure B6 PN35 use Grade 8.8 galvanised steel studs (GSS) and nuts or Grade 316 Class 70 stainless steel studs (SSS) and nuts with full face gasket - 1.5mm fibre gasket.

Table 5.7

Tightening torque values for ductile iron flanges with a raised face flanges					
Nominal size (DN)	Bolt size	Number of bolts	Bolt tension (kN)	Estimated torque (kN)	
				Well lubricated 'GSS' μ=0.15	Well lubricated 'SSS' μ=0.20
80	M16	8	50	120	160
100	M16	8	50	120	160
150	M20	12	80	240	320
200	M20	12	80	240	320
225	M24	12	115	415	550
250	M24	12	115	415	550
300	M24	16	115	415	550
375	M27	16	150	610	810
450	M30	20	185	835	1110
500	M30	24	185	835	1110
600	M33	24	230	1140	1520
750	M33	28	230	1140	1520

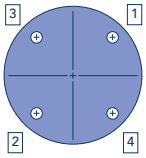
Note:

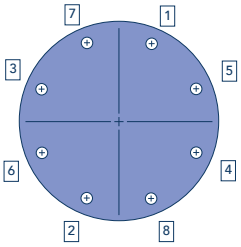
"Well Lubricated" refers to the application of molybdenum disulphide grease or equivalent anti-seize compound.

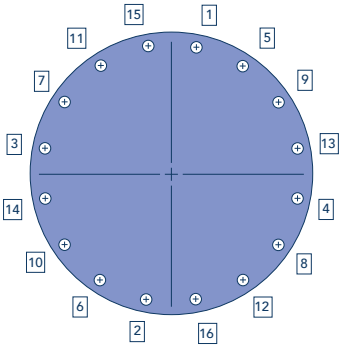
Tightening must be in three steps 30%, 60% and 100% of tightening torque.

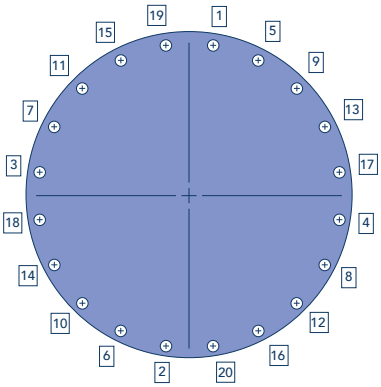
These guidelines are also applicable for dismantling joint and adapta flange fittings during flange to flange jointing.

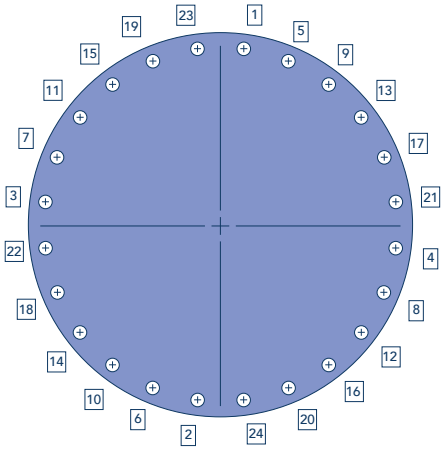
Flange to flange
(typical flange bolt tightening sequence)

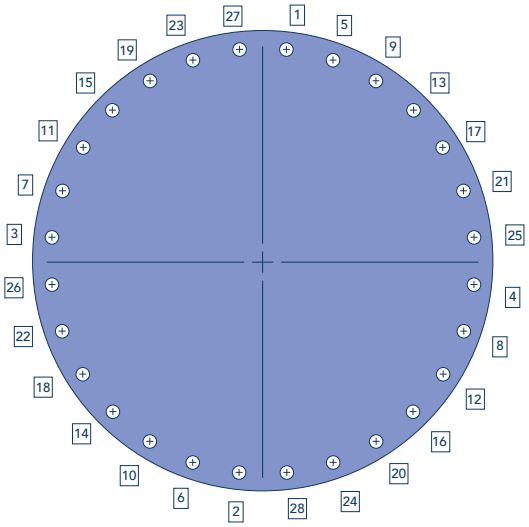












Tapped

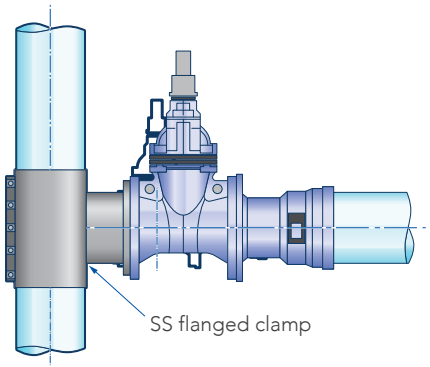
As with most pipe materials, Irontite ductile iron pipe cannot be direct tapped but will require either a tapping band or flanged branch sleeve pre tapped connector, depending on the diameter of the branch required.

Specialist contractors with equipment for live (under pressure) tapping must 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 must be drilled using suitable drill bits or hole saws. Only approved tapped bands must 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.

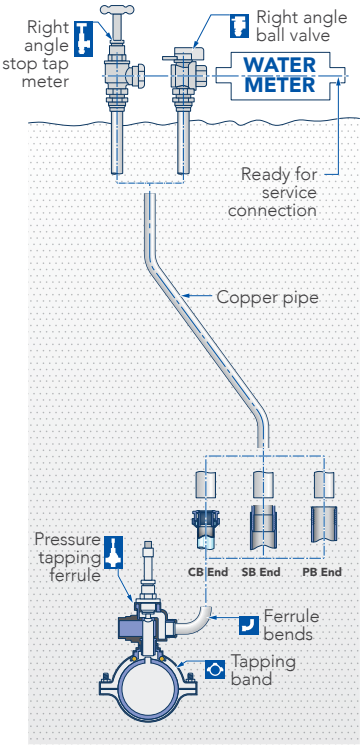
Under pressure cut-in

(Utilising stainless steel flanged clamp)

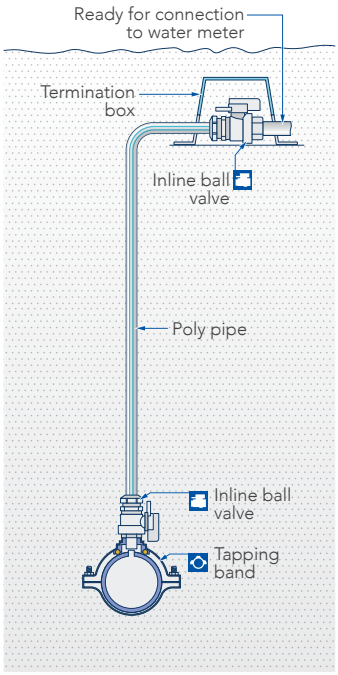


Typical service connections

Post installation assembly (tapping under pressure) GUIDE ONLY



Dry tapping assembly (unpressurised tapping) GUIDE ONLY



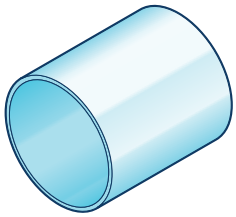
Note:

1. Approved 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 dependent 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.

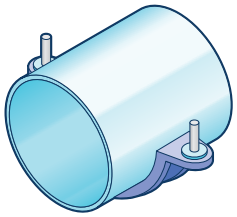
Installation guidelines

Taptite tapping bands

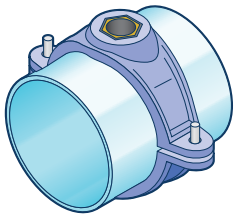
1. Prepare the area of the pipe to be covered by the tapping bands by removing all dirt and loose materials. Note: Suitable for F type (flexible) series 2 (PVC-O, PVC-M, and PVC-U) pipes and type R (rigid) DICL pipes.



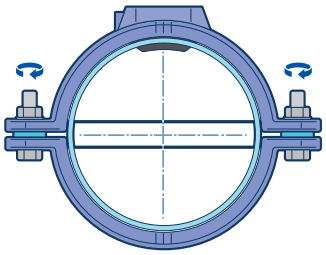
2. Position the bottom half of the tapping band with bolt and spacer in place making sure it is away from any scored, pitted, damaged areas, as this will not provide a good sealing area.



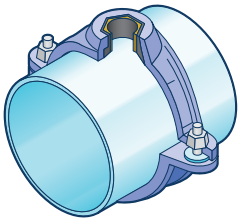
3. Fit the top of the tapping band around the pipe so that the bolts pass through the bolt holes in the top tapping band. Make sure the seal nut is properly placed inside the top tapping band.



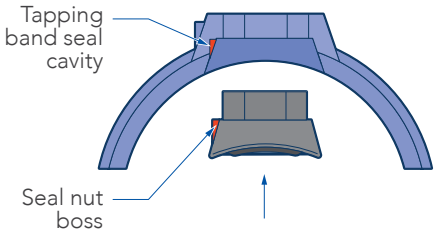
4. With one hand underneath the bottom half of the tapping band pressing upwards, locate the bolt holes and screw on nuts supplied with the other hand. Finger tighten the nuts so that the gap between the two halves of the tapping band is equal on both sides. Tighten the nuts to 15ft/lbs (20Nm).



5. When installing tapping bands with seal nuts, make sure the seal nut is in the correct position. The seal nut must 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.



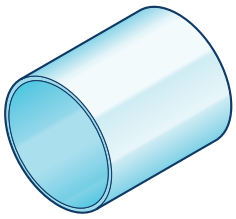
How to fit the "Inliner" sleeve to ductile iron pipe walls for tuberculation free service connections

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.
4. 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. The In-liner Inserter is designed so that the plunger is captive in the unit.
5. 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.

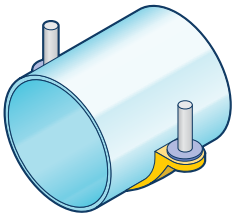
   Ferrule cocks must have full bore machining dimensions on the inlet orifice.

5.5 Installation guidelines Milnes gunmetal tapping bands

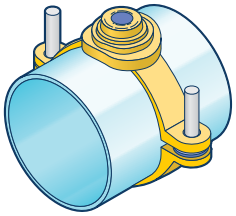
1. Prepare the area of the pipe to be covered by the tapping bands by removing all dirt and loose materials.



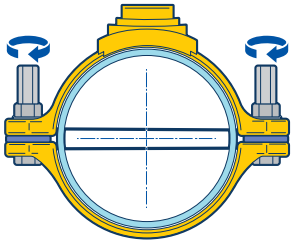
2. Position the bottom half of the tapping band with bolt and spacer (or small O Ring) in place making sure it is away from any scored, pitted, damaged areas, as this will not provide a good sealing area.



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 must 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 must be facing towards the pipe. **If the lip seal is placed in an incorrect position the joint may leak.**

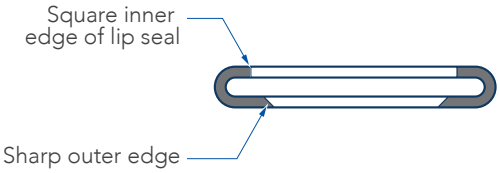


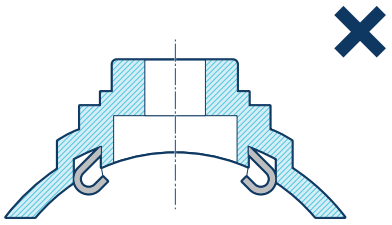
4. With one hand underneath the bottom half of the tapping band pressing upwards, locate the bolt holes and screw on the nuts supplied. Finger tighten the nuts so that the gap between the two halves of the tapping band is equal on both sides. Tighten the nuts to 15ft/lbs (20Nm).



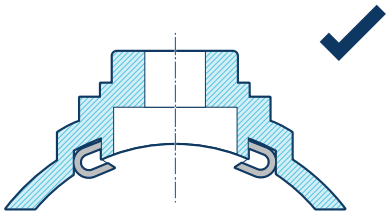
Additional requirements for lip seals

When installing tapping bands with lip seals, make sure the lip seal is in the correct position. The lip seal must 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 must 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.

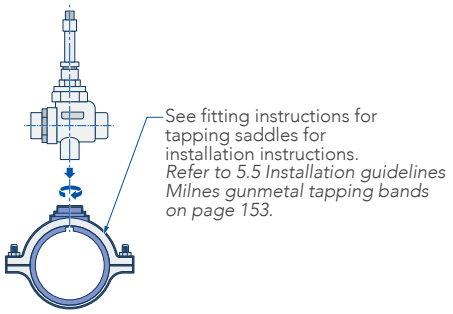
Standard tapping machine

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.

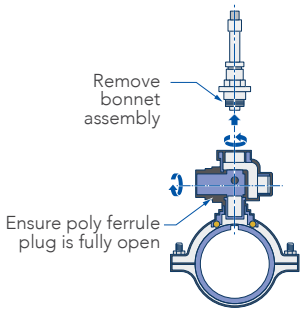
Heavy duty tapping machines suitable for tapping 32, 40 and 50mm are available. Contact Iplex for more details.

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.

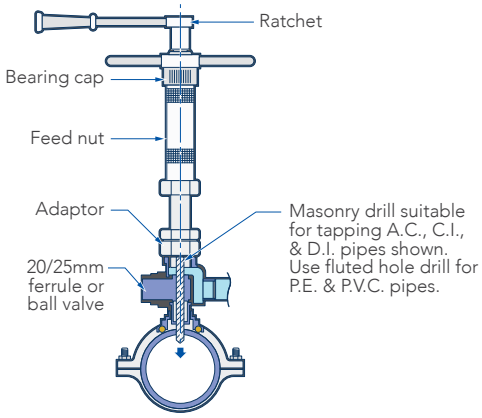
1. Fit an appropriate tapping band to the pipe and screw in the selected under pressure tapping ferrule.



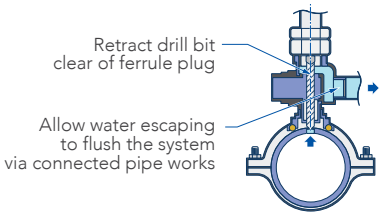
2. Unscrew the bonnet, remove the jumper valve, and fully open the poly ferrule plug. (Note: A ball valve may be used in lieu of the under pressure tapping ferrule where acceptable).



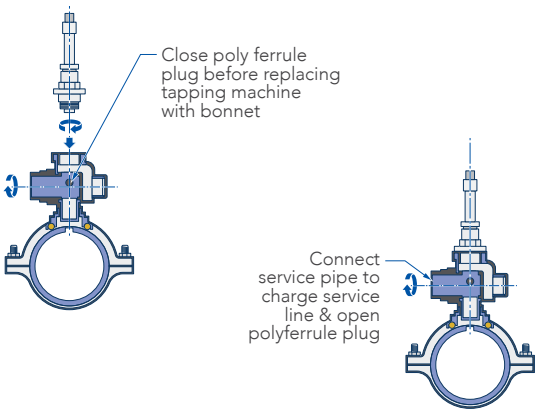
3. Screw the tapping machine into the top of the ferrule, using the correct adaptor as required.
4. Rotate the feed nut until the drill tip contacts the pipe.
5. Apply pressure to the drill bit via the feed nut, turning the ratchet at the same time to cut the hole.



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 wastewater).



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 for the tapping machine:

- 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:
  - Dislodgement of circlip
  - Damage to bearing
  - 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.

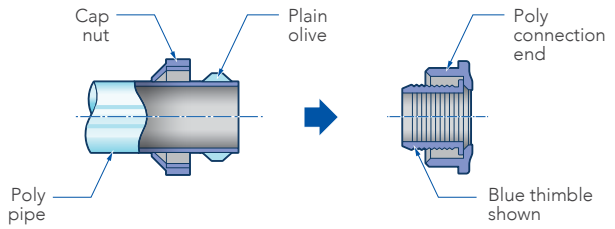
5.6 Installation guidelines connection ends

DN25 PL poly connection details– thimble/olive type

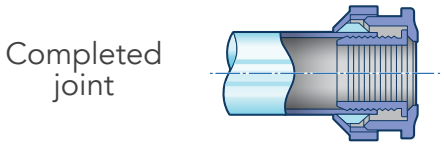
Application

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.



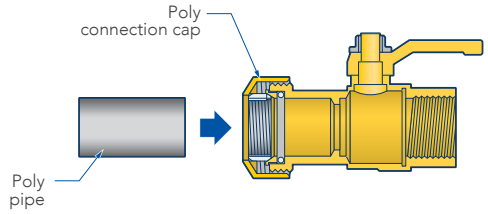
2. Complete joint by tightening the cap nut over the poly connection end of the fitting or valve.



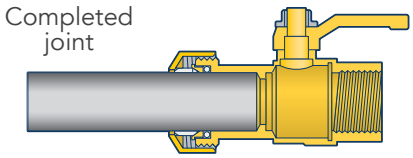
Thimble type	DN25 PE 80	DN25 PE100
Blue Thimble	PN12.5	PIN16/PN12.5
Red Thimble	PN16	-

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.

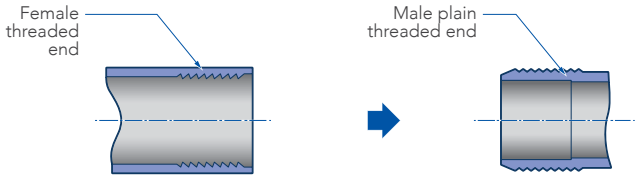


Male plain threaded connection details

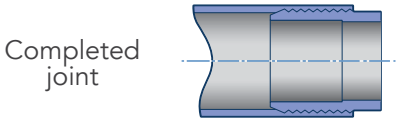
Application

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.

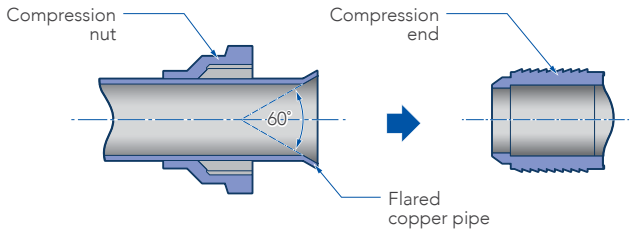
5.7 Installation guidelines

Copper compression connection details

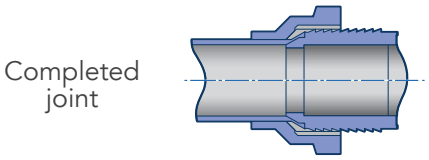
Application

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.

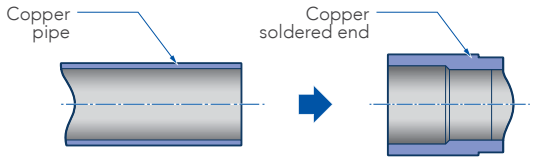


Copper soldered connection details

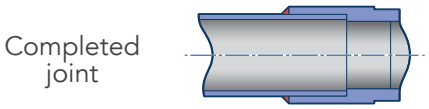
Application

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.



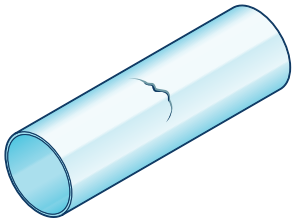
2. Complete joint by soldering to standard requirements.



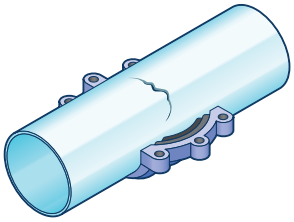
DN (Nominal Diameter)	Min. ID (mm)	Max. ID (mm)	Minimum ID length short socket (mm)	Minimum ID length short socket (mm)
20	19.07	19.07	7.5	13.5
25	25.42	25.56	7.5	17.0
32	31.77	31.91	7.5	-
40	38.12	38.32	7.5	-
50	50.82	51.02	7.5	-

5.8 Installation guidelines multi-fit joint

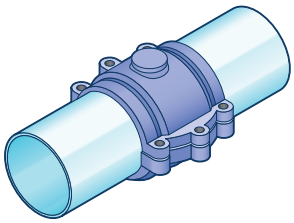
1. Prepare the area of the pipe to be covered by the multi-fit joint by removing all the dirt and loose materials.



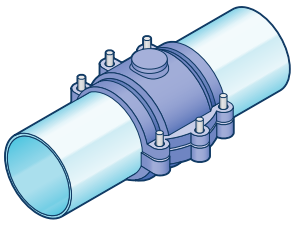
2. Position the bottom half of the multi-fit joint with seal in place. **Note: Approved lubricant to be applied to the surface of the pipe to assist in fitting the joint.**



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

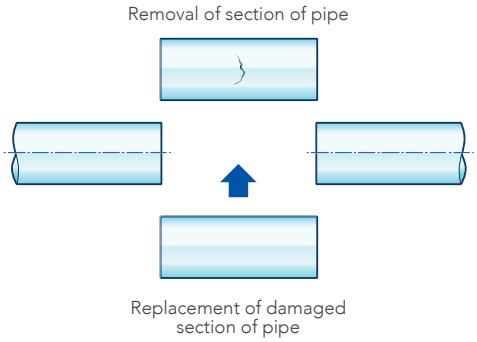


4. Install bolts and associated washes and nuts. Tighten the nuts to the respective tightening torques. **Note: Each multi-fit joint is provided with a tapping boss to facilitate the fitting of an off take if required.**



Removal and replacement of damaged section of pipe

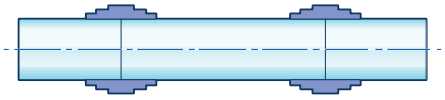
1. Removal of section of pipe.



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

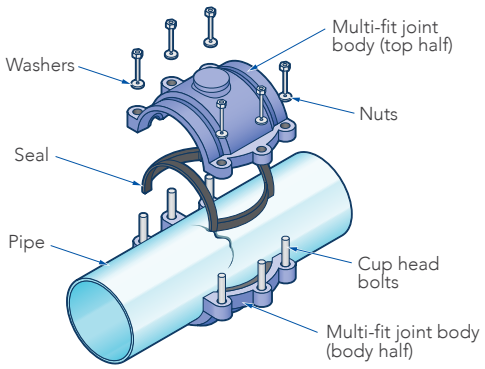
Note: Multi-fit joints can be used with:

- 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

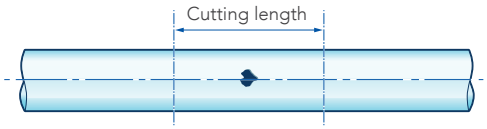


Multi-fit joint assembly components

5.9 Installation guidelines Gibault joint

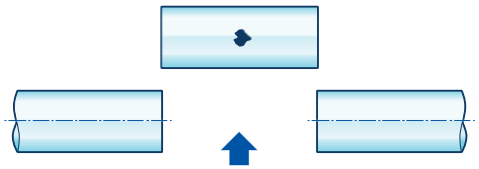
1. Mark the section of pipe for fitting or valve or repairing pipe for insertion.

   Cutting length = (fitting / valve / pipe insert length) + (2 x setting gap). Refer below Table 5.8 for setting gap.



(Cutting length) = (fitting/valve/pipe insert length) + (2 x setting gap)
Note: Refer below table for setting gap.

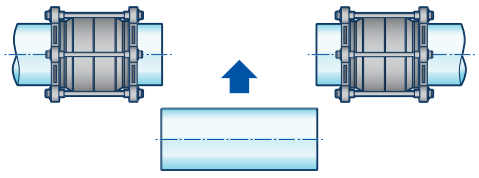
2. Removal of section of pipe.



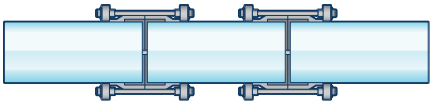
3. Ensure bolting is loose and apply pipe lubricant if required and slide Gibault along pipe. If Gibault joint will not slide on pipe, loose assembly bolts may be disassembled.

4. Insert pipe or spigoted fitting and slide Gibault over inserted section. Ensure Gibault's 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 spigoted tee or valve.



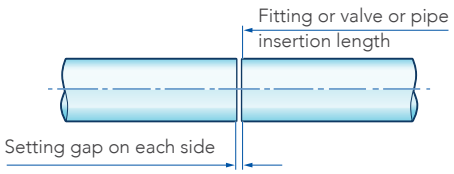
Section view of the completed assembly.

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.

Table 5.8

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

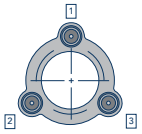


600	5.0°	52.0	62.0

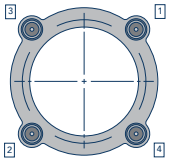
Tightening torque

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

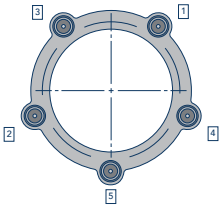
Tightening sequences



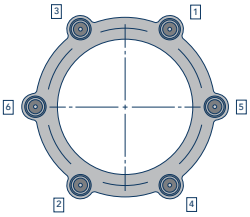
DN100 & DN150



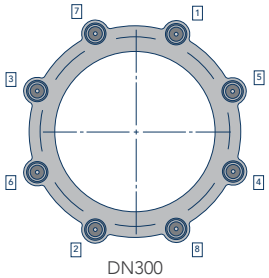
DN200



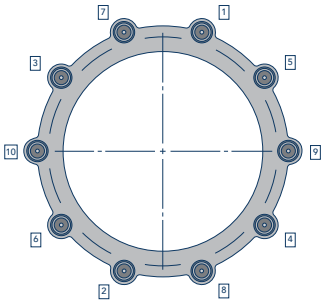
DN225



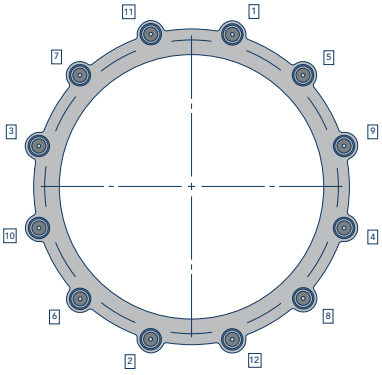
DN250



DN300



DN375 & DN450

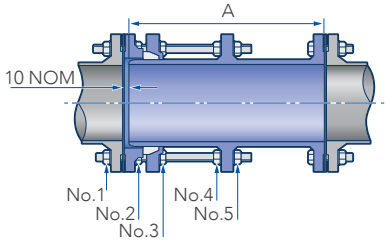


DN500 & DN600

5.10 Installation guidelines – dismantling joints

5.10.1 Dismantling joints type 'B' (thrust type)

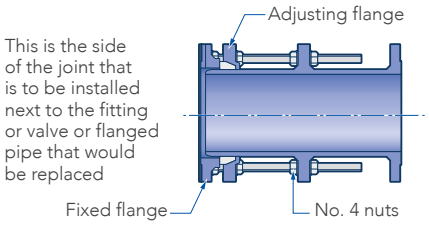
Dismantling joints are installed in pipelines to facilitate removal and replacement of valves, pipes, or fittings in the line. By removing and adjusting certain stud nuts, the stud and the loosened flanges can be retracted sufficiently to allow for the removal and replacement of the joint and associated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



All dismantling joints are supplied loosely assembled and must be installed in the following sequence:

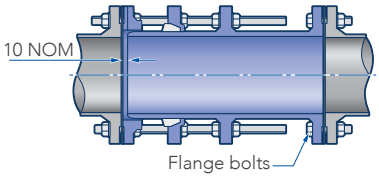
Note: For Type 'B' joints ensure that the flange to flange gap in line is as shown. (The joint assembly must be supplied to drop directly into the gap)

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.

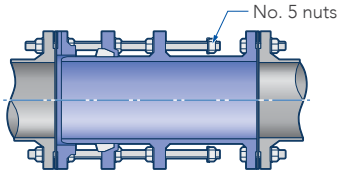


2. Install the standard flange bolts and tighten as per the standard flange bolt tightening practice. See image below.

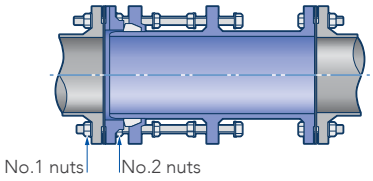
Note: Ensure that the flange to flange gap in line is as shown below.



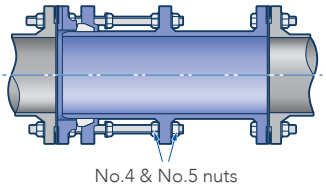
3. Turn the No.5 nuts until they are only a couple of turns from the end of the studs.



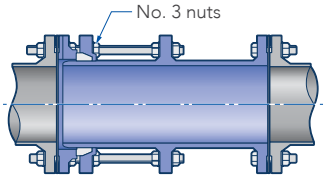
4. Slide the fixed flange, seal, adjusting flange and studs along the spigot of the dismantling joint body until the fixed flange mates evenly to the adjoining pipe/fitting. **(Note: The No.3 nuts will have to be backed off during this operation).** Tighten the No.1 and No.2 nuts as per standard flange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



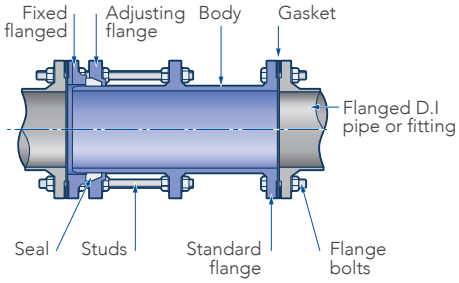
5. Tighten the No.4 and No.5 nuts as per standard flange bolt tightening practice (refer below for torque values).



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.



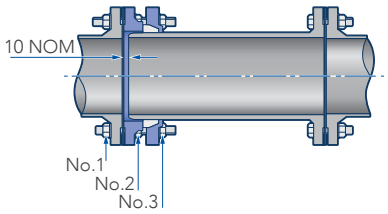
5.10.2 Type 'B' dismantling joint components (thrust type)



Refer to pages 148 - 150 for stud and tightening torques, estimating tightening torque valves and typical bolt tightening sequence.

5.10.3 Installation guidelines dismantling joints type 'D' (non-thrust type)

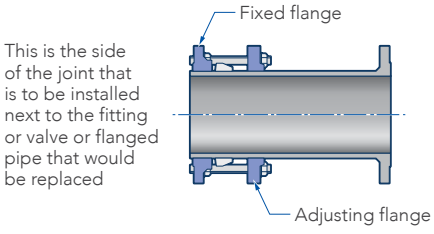
Dismantling joints are installed in pipelines to facilitate removal and replacement of valves, pipes, or fittings in the line. By removing and adjusting certain stud nuts, the stud and the loosened flanges can be retracted sufficiently to allow for the removal and replacement of the joint and associated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



All dismantling joints are supplied loosely assembled and must be installed in the following sequence.

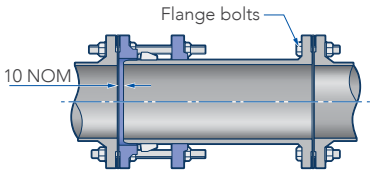
Note: For Type 'D' joints the gap in the line must be the length of the spigot/ flange pipe or fitting plus 10mm, as shown. Slide the joint over the spigot end until the pipe or fitting can be directly dropped into the gap.

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.

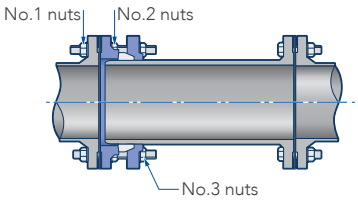


2. Drop the joint assembly along with the spigot/flange pipe or fitting into the gap. Ensure that the No.1 nuts and associated washers are removed. Install the standard flange bolts and tightenflange bolt tightening sequence given on page 150

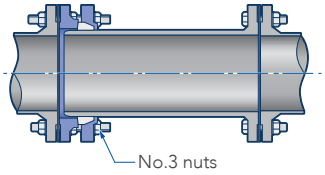
Note: Ensure that the gap in the line is 10mm.



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.)



5.10.4 Type 'D' dismantling joint components (non-thrust type)

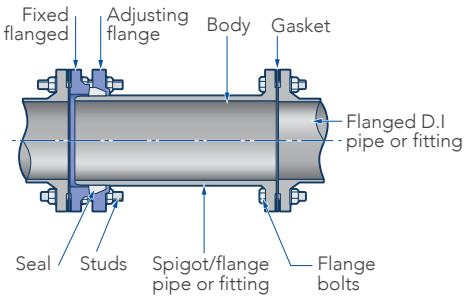


Table 5.9: Details of stud and tightening torques for dismantling joints type 'B' (thrust) and Type 'D' (non-thrust)

No.3 nuts PN16		
Nominal size (DN)	Type 'D'	
	Stud details	Stud tightening torque (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

Table 5.10

No.3 nuts PN35		
Nominal size (DN)	Type 'D'	
	Stud details	Stud tightening torque (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)

For standard pressure flanges as AS/NZS 4087 Figure B5 PN16 use 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.

Table 5.11

Nominal size (DN)	Bolt size	Number of bolts	Bolt tension (kN)	Estimated torque (Nm)	
				Well lubricated 'GSB' μ=0.15	Well lubricated 'SSB' μ=0.20
80	M16	4	20	50	65
100	M16	4	20	50	65
150	M16	8	20	50	65
200	M16	8	25	60	80
225	M16	8	25	60	80
250	M20	8	35	105	140
300	M20	12	35	105	140
375	M24	12	50	180	240
450	M24	12	55	200	265
500	M24	16	55	200	265
600	M27	16	70	285	380
750	M30	20	80	360	480

For high pressure flanges as AS/NZS 4087 Figure B6 PN35 use 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.

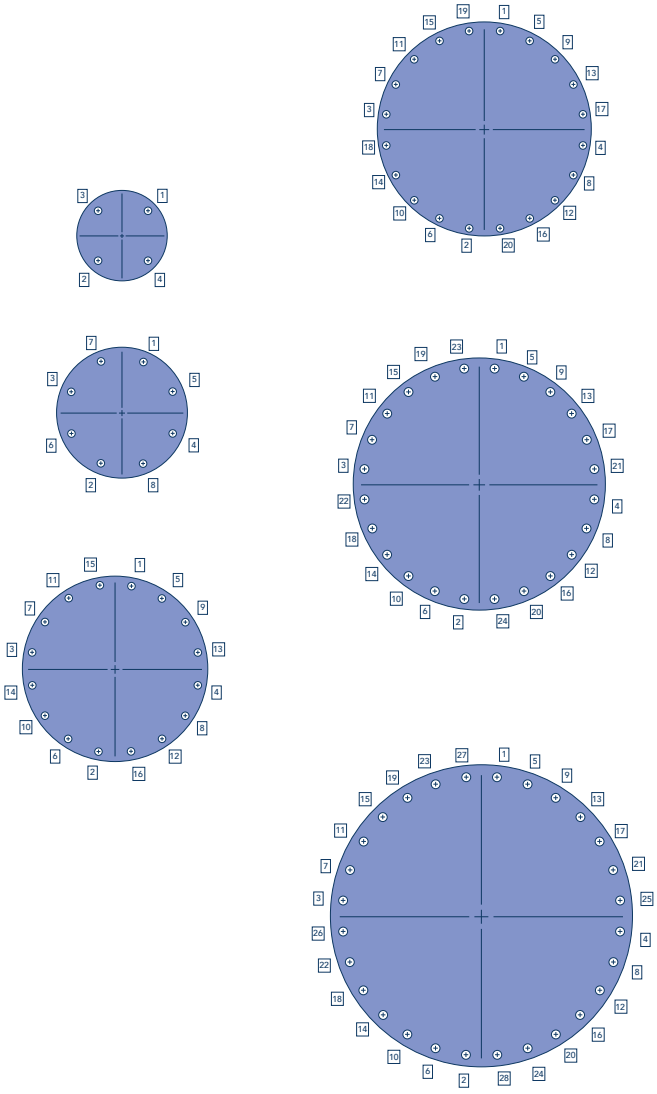
Table 5.12

Nominal size (DN)	Bolt size	Number of bolts	Bolt tension (kN)	Estimated torque (kN)	
				Well lubricated 'GSS' μ=0.15	Well lubricated 'SSS' μ=0.20
80	M16	8	50	120	160
100	M16	8	50	120	160
150	M20	12	80	240	320
200	M20	12	80	240	320
225	M24	12	115	415	550
250	M24	12	115	415	550
300	M24	16	115	415	550
375	M27	16	150	610	810
450	M30	20	185	835	1110
500	M30	24	185	835	1110
600	M33	24	230	1140	1520
750	M33	28	230	1140	1520

Note:

- For lightly oiled μ=0.22 and for well lubricated μ=0.15.
- Lightly oiled (basic lubricant).
- Well lubricated.
- Recommended tightening in three steps 30%, 60% and 100%.

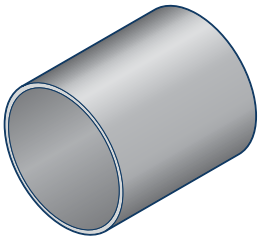
5.10.5 Typical bolt tightening sequence for dismantling joints type ‘B’ (thrust) and type ‘D’ (non-thrust)



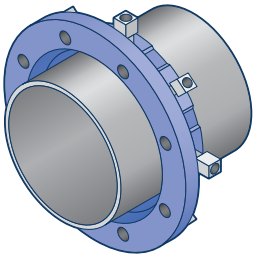
5.11 Installation guidelines adapta flanges

1. Ensure that the end of the pipe is clean and cut square to the centre line of the pipe. The square end must be deburred as required and must not be chamfered.

Note: Adapta Flanges are suitable for Ductile Iron Pipe only.



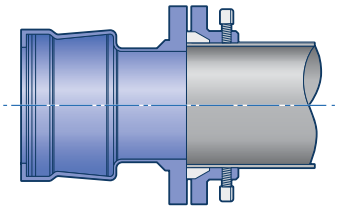
2. Slide the flange onto the pipe and hand turn the set screws until they lightly touch the pipe circumference but still allow the flange to slide freely. Ensure that the gap between the inside of the flange and the outside of the pipe is even all round.



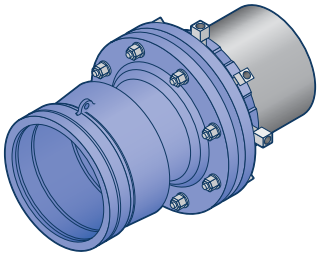
3. Lubricate the seal with an approved lubricant and position on the pipe approximately 5mm from the end.

Note: No other flange gasket is required when using an adapta-flange.

4. Slide the flange forward onto the seal. The seal must 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 must be kept to a minimum but must 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 must be as shown in Table 5.14.



7. Ensure that all set screws are touching the pipe circumference before tightening evenly to the torque specified in Table 5.13.

Note:

- When the joint is subjected to high vibration, the application of a thread locking compound on the set screws is required.
- The maximum water working pressure of the adapta flange joint is given in Table 5.13.

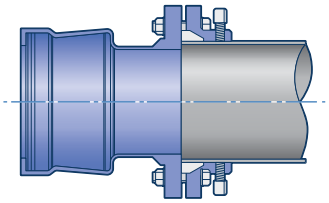
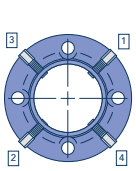


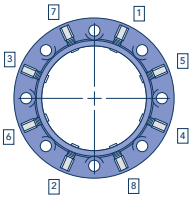
Table 5.13

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

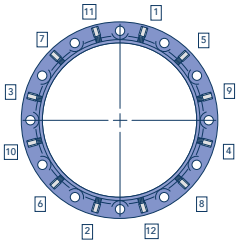
Typical set screw tightening sequence



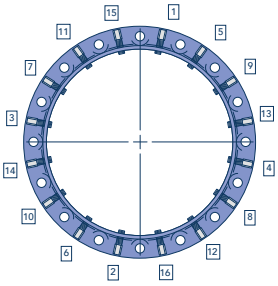
DN80 - DN100



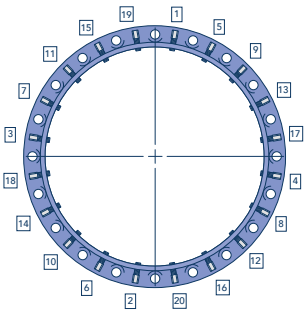
DN150 - DN250



DN300 - DN450

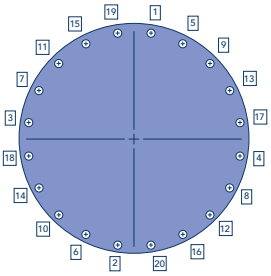


DN500 - DN600

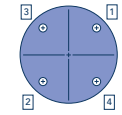


DN750

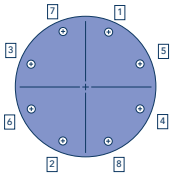
Typical flange bolt tightening sequence



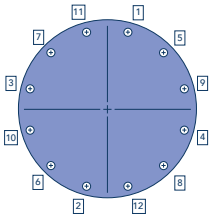
DN750



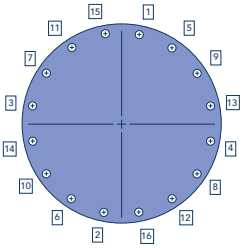
DN80 & DN100



DN150 & DN250



DN300 & DN450



DN500 & DN600

Table 5.14

Nominal size (DN)	Bolt size	Number of bolts	Bolt tension (kN)	Estimated torque (Nm)	
				Well lubricated 'GSB' μ=0.15	Well lubricated 'SSB' μ=0.20
80	M16	4	20	50	65
100	M16	4	20	50	65
150	M16	8	20	50	65
200	M16	8	25	60	80
225	M16	8	25	60	80
250	M20	8	35	105	140
300	M20	12	35	105	140
375	M24	12	50	180	240
450	M24	12	55	200	265
500	M24	16	55	200	265
600	M27	16	70	285	380
750	M30	20	80	360	480

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