

# **Water Supply and Sewerage Approved Products Manual - February 2006**

## **Pressure Sewerage Products – Ductile Iron Pipeline System**

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**SPPS 01-S1 SPIGOT-SOCKET PIPES TO AS/NZS 2280**

<b>STANDARD</b>	AS/NZS 2280:2004 Ductile iron pressure pipes and fittings
<b>DESIGN</b>	Ductile iron pipes to the Australian Standard have dimensions based on imperial sizing. As a result, the metric nominal sizing relates only roughly to the internal diameter of the pipe after cement lining. Pipe is classified by PN number based on the allowable operating pressure. Standard pressure classifications are PN20 and PN35. Other pressure classifications are allowed by AS2880:2004 and include PN16, PN25, PN30, PN40 and PN45. Allowable operating pressure of the pipe is generally not a factor in design due to the lower rating of pipe flanges and valves.
<b>MATERIALS</b>	<p><b>Pipe:</b> Spheroidal graphite cast iron (commonly known as ductile iron) – manufactured from scrap ductile iron, steel, ferrosilicon, coke, limestone and magnesium</p> <p><b>Internal lining:</b> GP or SL or SR cement to AS 3972 and inert aggregate          Calcium aluminate cement to EN14647          Nominal lining thickness - 5mm for DN100 to DN600 and 6mm for DN750          Minimum lining thickness - 3.5mm for DN100 to DN600 and 4.5mm for DN750</p> <p><b>External coating:</b> Bitumen to AS/NZS 3750.4 (sleeving also required)          Synthetic resin base coating to AS 4089          Thermal bonded polymer to AS/NZS 4158          Other external coatings may be considered for approval</p> <p><b>Socket lining:</b> Thermal bonded polymer to AS/NZS 4158          Other socket linings may be considered for approval</p> <p><b>Joint seal:</b> Approved elastomer to AS 1646.1 and AS 1646.2 or AS 1646.3</p>
<b>JOINTING</b>	Skid fit elastomeric sealing joint allowing minimum joint deflections of 3.5° for DN 100-250, 2.5° for DN 300-600 and 1° for DN 750. Sockets with grooves to capture elastomeric seals. Sockets and seals of proprietary profile designs (e.g. Tyton, Griptite). Spigot end to be chamfered over 10 to 20 mm at approx. 20° to pipe barrel. Witness marks at spigot end showing insertion depth for maximum angular deflection and no angular deflection. Lubricant as supplied by pipe manufacturer.
<b>EFFECTIVE LENGTH</b>	<b>Minimum:</b> 5.0 m
<b>ALLOWABLE OPERATING PRESSURE</b>	<b>PN20:</b> 2.0 MPa <b>PN35:</b> 3.5 MPa
<b>MARKINGS</b>	<p>Manufacturer's name or mark</p> <p>Nominal size</p> <p>Classification</p> <p>The standard designation AS/NZS 2280</p> <p>Product certification mark, e.g. StandardsMark</p> <p>Traceability code</p> <p>Place of manufacture (may be incorporated in traceability code)</p>
<b>MARKING METHOD</b>	Semi-permanent painted marking along the pipe barrel. Lettering height not specified in AS/NZS 2280.
<b>USE LIMITS</b>	Normal Portland cement mortar (GP or SL) is not resistant to sulphuric acid that can form if H <sub>2</sub> S develops in any headspace in the sewer. Sections of cement mortar lined pressure mains subject to partially full flow could experience sulphuric acid attack if pressure main is not designed to avoid H <sub>2</sub> S generation (i.e. slime stripping velocity not achieved). H <sub>2</sub> S is typically released at high points on the pipeline when pressure in the line drops below 5m head.

**SPPS 01-S1      SPIGOT-SOCKET PIPES TO AS/NZS 2280**

GP or SL cement mortar should not be used if sulphate levels in the pressure sewer are likely to exceed 600 mg/litre. SR cement mortar is suitable for sulphate levels up to 6,000 mg/litre. If sulphate levels are likely to exceed 6,000 mg/litre or pH is likely to drop below 5.5, use calcium aluminate cement (CAC) mortar linings.

Only use DI pipe in tidal zones, anaerobic ground conditions and aggressive ground water when it has an external polymeric coating

Suitable for above ground use, i.e. where bridging support is provided, e.g. water course, culvert, drain and exposed bridge crossings

Externally coated bitumen pipes not suitable for use in extreme marine environments - seek specialist advice.

Use restraining elastomeric seals where buried service congestion prevents the use of thrust blocks or is subject to extreme ground movement.

Only use under or near DC traction systems (e.g. electric trains) with appropriate stray current insulation.

Suitable for use as conduit pipe for high loading applications, e.g. major road crossings, shallow cover, railway crossings.

**SPPS 01-S3      FLANGED PIPES TO AS/NZS 2280**

<b>STANDARD</b>	AS/NZS 2280: 2004    Ductile iron pressure pipes and fittings AS/NZS 4087:2004    Metallic Flanges for waterworks purposes
<b>DESIGN</b>	Ductile iron pipes to the Australian Standard have dimensions based on imperial sizing. As a result, the metric nominal sizing relates only roughly to the internal diameter of the pipe after cement lining. Flange Class pipe has a greater wall thickness than PN20 and PN35 pipe. Allowable operating pressures for flanged pipes are governed by the pressure rating of the flanges.
<b>MATERIALS</b>	<p><b>Pipe and flanges:</b>                      Spheroidal graphite cast iron (commonly known as ductile iron) – manufactured from scrap ductile iron, steel, ferrosilicon, coke, limestone and magnesium.</p> <p><b>Internal lining:</b>                            GP or SL or SR cement to AS 3972 and inert aggregate Thermal bonded polymer to AS/NZS 4158 Other linings may be considered</p> <p><b>External coating:</b>                        Bitumen to AS/NZS 3750.4 (sleeving also required) Synthetic resin based coating to AS 4089 Thermal bonded polymer to AS/NZS 4158 Other coatings may be considered</p> <p><b>Flange thread seal:</b>                      Epoxy resin</p> <p><b>Flange gasket:</b>                            Elastomer to AS 1646</p>
<b>JOINTING</b>	<p><b>Standard flanges:</b>                        Screw-on flanges to AS 4087 figure B5 for PN16 and AS 4087 figure B6 for PN35</p> <p><b>Flange gasket:</b>                            1.5mm and 3mm flat elastomeric full face gasket to AS 4087 for PN16 and PN35 - Appendix C, Table C1</p> <p><b>Socket and spigot:</b>                        Refer spigot-socket pipes specification</p>
<b>EFFECTIVE LENGTH</b>	<p><b>Maximum:</b>                                    5.35m</p> <p><b>Minimum:</b>                                    No value given in reference standard or specifications</p>
<b>ALLOWABLE OPERATING PRESSURE</b>	<p><b>PN16:</b>                                        1.6 MPa</p> <p><b>PN35:</b>                                        3.5 MPa</p>
<b>MARKINGS</b>	<p>Manufacturer's name or mark</p> <p>Nominal size</p> <p>Classification</p> <p>The standard designation AS/NZS 2280</p> <p>Product certification mark, e.g. StandardsMark</p> <p>Traceability code</p> <p>Place of manufacture (may be incorporated in traceability code)</p>
<b>MARKING METHOD</b>	Semi-permanent marking along the pipe barrel. Lettering height not specified in AS/NZS 2280.
<b>USE LIMITS</b>	Use only where restrained joints are required and spigot-socket restrained joints are inappropriate. Normal Portland cement mortar (GP or SL) is not resistant to H <sub>2</sub> S gas attack and sulphuric acid resulting from H <sub>2</sub> S. Sections of cement mortar lined pressure mains subject to partially full flow could experience H <sub>2</sub> S attack if pressure main is designed to avoid H <sub>2</sub> S generation (i.e. slime stripping velocity not achieved).
<b>NOTE:</b>	The barrel of Flange Class pipe is tested to a pressure equal to or higher than the final pressure classification prior to fitting of flanges. Due to difficulties in restraining flanged pipe lengths during works hydrostatic tests, the completed flanged pipe may not be tested to its final pressure classification. AS 2280 requires DN100 to DN600 to be tested to 1.6 MPa or higher after flanges have been fitted, however DN750 is tested to 1.0 MPa complete with flanges. Calcium aluminate cement lining not available with flanged pipe

**SPPS 01-S4 FITTINGS TO AS/NZS 2280**

<b>STANDARD</b>	AS/NZS 2280: 2004 Ductile iron pressure pipes and fittings AS/NZS 4087:2004 Metallic Flanges for waterworks purposes
<b>DESIGN</b>	Ductile iron fittings to the Australian Standard have dimensions based on imperial sizing. As a result, the metric nominal sizing relates only roughly to the internal diameter after cement lining.
<b>MATERIALS</b>	<p><b>Fitting:</b> Spheroidal graphite cast iron to AS 1831 (commonly known as ductile iron) – manufactured from scrap ductile iron, steel, ferrosilicon, coke, limestone and magnesium</p> <p><b>Internal lining:</b> Thermal bonded polymer to AS/NZS 4158</p> <p><b>External coating:</b> Thermal bonded polymer to AS/NZS 4158</p> <p><b>Joint seal:</b> Elastomer to AS 1646</p>
<b>JOINTING</b>	<p><b>Socket:</b> Sockets with grooves to capture elastomeric seals. Sockets and seals of proprietary profile designs (e.g. Tyton, Griptite). Allowable minimum joint deflections of 3.5° for DN 100-250, 2.5° for DN 300-600 and 1° for DN 750. Jointing lugs on 90° and 45° bends for sizes DN 200 and greater.</p> <p><b>Spigot:</b> End to be chamfered over 10 to 20 mm at approximately 20° to pipe barrel. Jointing lugs on 90° and 45° bends for sizes DN 200 and greater.</p> <p><b>Flange:</b> Integral flanges to AS 4087 figure B5 for PN16 and figure B6 for PN35. 1.5mm and 3mm flat elastomeric full face gasket to AS 4087 for PN16 and PN35 - Appendix C, Table C1</p>
<b>ALLOWABLE OPERATING PRESSURE</b>	<p><b>PN16:</b> 1.6 MPa</p> <p><b>PN35:</b> 3.5 MPa</p>
<b>MARKINGS</b>	<p>Manufacturer’s name or mark cast on</p> <p>Nominal size</p> <p>Ductile or DI moulded in raised form</p> <p>Where applicable, the angle of the bend cast on</p> <p>The standard designation AS/NZS 2280</p> <p>Product certification mark, e.g. StandardsMark</p> <p>Traceability code</p> <p>Place of manufacture (may be incorporated in traceability code)</p>
<b>MARKING METHOD</b>	Clearly and indelibly marked on the fitting. Lettering heights and raised height not specified in AS/NZS 2280.

**SPPS 01-S5 JOINT SEALS FOR AS/NZS 2280 PIPES/FITTINGS**

<b>STANDARD</b>	AS 1646: 2000 Elastomeric seals for waterworks purposes AS 4087: 2004 Metallic flanges for waterworks purposes
<b>SEALING DESIGN</b>	Joint seals are to be of elastomeric compounds comprising suitable polymers. The elastomers have performance properties, which deteriorate with time and as such the design of the seal's profile and the compounding of the elastomer needs to ensure long term sealing of the joint. The elastomer properties affecting long term sealing performance are hardness, rate of compression stress relaxation, water absorption, resistance to ageing, resistance to chemicals and resistance to microbiological deterioration.
<b>LATERAL RESTRAINT DESIGN</b>	An option for lateral restraint of the spigot-socket joint available for use with Tyco Water pipes is the TYTON-LOK spigot-socket joint seal. This seal has stainless steel segments moulded into it at uniform intervals around the seal ring, which lock onto the spigot wall to resist joint pull-out.
<b>COMPOUND MATERIALS</b>	<p><b>Polymer for spigot-sockets rings:</b> Ethylene propylene diene monomer (EPDM), 40% minimum volume of compound for IRHD of <math>\geq 55 &lt; 85</math> Styrene Butadiene Rubber (SBR), 50% minimum volume of compound for IRHD of <math>\geq 55 &lt; 85</math></p> <p><b>Polymer for flange gaskets:</b> Ethylene propylene diene monomer (EPDM), 30% minimum volume of compound for IRHD of <math>\geq 35 &lt; 55</math> or 40% minimum volume of compound for IRHD <math>\geq 55 \leq 65</math> Styrene Butadiene Rubber (SBR), 50% minimum volume of compound for IRHD of <math>\geq 35 &lt; 55</math> or <math>\geq 55 \leq 65</math></p> <p><b>Antidegradant:</b> For EPDM: Not required For SBR: Based on the combined antioxidant-antiozonant N-(1,3-dimethyl-butyl)-N'-phenyl-p-phenylene diamine with a concentration (m/m) of not less than 1.5 parts per hundred of polymer.</p> <p><b>Protective wax:</b> For EPDM: Not required For SBR: Wax with a melting point <math>\geq 57^{\circ}\text{C}</math> and concentration (m/m) not greater than 3.0 parts per hundred of polymer.</p> <p><b>Filler:</b> Carbon black</p> <p><b>Copper &amp; manganese:</b> For EPDM: Not applicable For SBR: Not greater than 0.0008% copper and 0.0005% manganese</p>
<b>MARKINGS</b>	<p><b>Rings:</b> Manufacturer's identification mark Cavity number, if applicable Nominal size or nominal internal and cord diameters as appropriate Year of manufacture, e.g. 01 to represent year 2001 Standard designation where the elastomeric ring is certified to AS 1646</p>
<b>MARKING METHODS</b>	Embossing with lettering $3 \pm 1$ mm high and $0.3 \pm 0.1$ mm proud of the surface; or Vulcanised transfer or permanent ink with lettering $3.5 \pm 1.5$ mm.
<b>ELASTOMER TYPE IDENTIFICATION</b>	<p><b>Marking colour:</b> EPDM: Green SBR: Blue</p> <p><b>Marking method:</b> Continuous durable stripe of width <math>3.5 \pm 1.5</math> mm; or Durable flash or dot of 6 mm minimum dimension</p>
<b>STORAGE</b>	<ul style="list-style-type: none"> <li>• Do not store seals in a room with any equipment capable of generating ozone (e.g. mercury vapour lamps, electric motors, high voltage equipment).</li> <li>• Store in a relaxed condition free from tension, compression or other deformation.</li> <li>• Seal temperature not to exceed <math>35^{\circ}\text{C}</math> and preferably not above <math>25^{\circ}\text{C}</math> or less than <math>5^{\circ}\text{C}</math>.</li> </ul>
<b>USE LIMITS</b>	<p>Do not use elastomeric seals removed from packaging for more than 3 months</p> <p>Do not use elastomeric seals older than 18 months from date of manufacture unless supplier can demonstrate that seals have been stored in a cool, controlled environment</p> <p>Do not use SBR elastomeric seals more than 3 years from date of manufacture</p> <p>Do not use EPDM elastomeric seals more than 6 years from date of manufacture</p> <p>Do not use SBR seals that have been stored unprotected from sunlight for more than 7 days</p> <p>Do not use elastomeric seals that have been in contact with chemicals, e.g. solvents (petrol).</p>

## SPPS 01-S7 JOINTING LUBRICANT

STANDARD	None
DESIGN	Jointing lubricant is to achieve the following: <ul style="list-style-type: none"><li>• Provide sufficient lubrication to prevent damage to joint seals or surfaces on jointing.</li><li>• Enable correctly configured jointing when using jointing methods recommended by the pipe or fitting manufacturer.</li><li>• Not affect the elastomer or pipe or fitting materials.</li><li>• Remain an effective lubricant under wet conditions.</li><li>• Not be hazardous to handle and able to be applied by hand.</li><li>• Be completely soluble in water.</li><li>• Able to be removed under standard flushing arrangements for commissioning.</li></ul>
MATERIALS	Lubricant: Water based emulsion
CONTAINER MARKINGS	Manufacturer's name or trademark Proprietary name of joint seal with which the lubricant can be used. The words 'Jointing Lubricant' or 'Joint Lubricant'. Date of manufacture. Date of expiry for use. Instructions for use of lubricant
USE LIMITS	Do not use where past expiry date.



**SPIGOT-SOCKET PIPES**

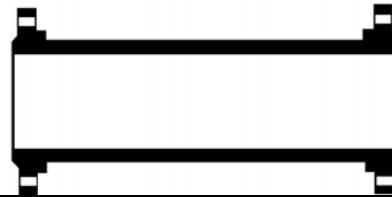


Nominal size DN	Tyco Water TytonExtreme PN20	Tyco Water TytonExtreme PN35
100		✓
150		✓
200		✓
225	✓	✓
250	✓	✓
300	✓	✓
375	✓	✓
450	✓	✓
500	✓	✓
600	✓	✓
750	✓	✓

**NOTES**

1. TytonExtreme pipe is lined with calcium aluminate cement

**FLANGE-FLANGE PIPES**

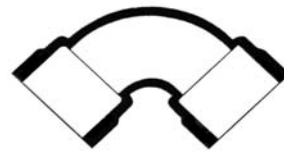


Nominal size DN	Tyco Water
100	✓
150	✓
200	✓
225	✓
250	✓
300	✓
375	✓
450	✓
500	✓
600	✓
750	✓

**NOTES**

1. Flanged pipes coated internally and externally with thermal bonded coating - available in lengths up to 2.7m
2. Not available with calcium aluminate cement lining

**SOCKET-SOCKET BENDS**

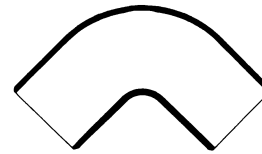


Nominal size DN x degrees	Mallet	Tyco Water	Tyco Water Auslite <sup>1</sup>	Derwent	Dobbie Dico
100 x 11.25	✓	✓	✓	✓	✓
100 x 22.5	✓	✓	✓	✓	✓
100 x 45	✓	✓	✓	✓	✓
100 x 90	✓	✓	✓	✓	✓
150 x 11.25	✓	✓	✓	✓	✓
150 x 22.5	✓	✓	✓	✓	✓
150 x 45	✓	✓	✓	✓	✓
150 x 90	✓	✓	✓	✓	✓
200 x 11.25	✓	✓		✓	✓
200 x 22.5	✓	✓		✓	✓
200 x 45	✓	✓		✓	✓
200 x 90	✓	✓		✓	✓
225 x 11.25	✓	✓		✓	
225 x 22.5	✓	✓		✓	
225 x 45	✓	✓		✓	
225 x 90	✓	✓		✓	
250 x 11.25	✓	✓		✓	✓
250 x 22.5	✓	✓		✓	✓
250 x 45	✓	✓		✓	✓
250 x 90	✓	✓		✓	✓
300 x 11.25	✓	✓		✓	
300 x 22.5	✓	✓		✓	
300 x 45	✓	✓		✓	
300 x 90	✓	✓		✓	
375 x 11.25	✓	✓		✓	
375 x 22.5	✓	✓		✓	
375 x 45	✓	✓		✓	
375 x 90	✓	✓		✓	
450 x 11.25	✓	✓		✓	
450 x 22.5	✓	✓		✓	
450 x 45	✓	✓		✓	
450 x 90	✓	✓		✓	
500 x 11.25	✓	✓		✓	
500 x 22.5	✓	✓		✓	
500 x 45	✓	✓		✓	
500 x 90	✓	✓		✓	
600 x 11.25	✓	✓		✓	
600 x 22.5	✓	✓		✓	
600 x 45	✓	✓		✓	
600 x 90	✓	✓		✓	
750 x 11.25	✓	✓			
750 x 22.5	✓	✓			
750 x 45	✓	✓			
750 x 90	✓	✓			

**NOTES**

1. Auslite fittings available in PN16 rating only

**SPIGOT-SPIGOT BENDS**

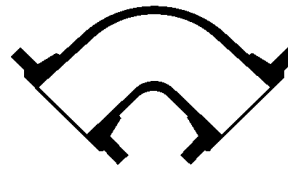


Nominal Size DN x Degrees	Mallet <sup>1</sup>	Tyco Water	Derwent
100 x 11.25	✓	✓	✓
100 x 22.5	✓	✓	✓
100 x 45	✓	✓	✓
100 x 90	✓	✓	✓
150 x 11.25	✓	✓	✓
150 x 22.5	✓	✓	✓
150 x 45	✓	✓	✓
150 x 90	✓	✓	✓
200 x 11.25	✓		✓
200 x 22.5	✓		✓
200 x 45	✓		✓
200 x 90	✓		✓
225 x 11.25	✓		✓
225 x 22.5	✓		✓
225 x 45	✓		✓
225 x 90	✓		✓
250 x 11.25	✓		✓
250 x 22.5	✓		✓
250 x 45	✓		✓
250 x 90	✓		✓
300 x 11.25	✓		✓
300 x 22.5	✓		✓
300 x 45	✓		✓
300 x 90	✓		✓
375 x 11.25	✓		✓
375 x 22.5	✓		✓
375 x 45	✓		✓
375 x 90	✓		✓
450 x 11.25	✓		✓
450 x 22.5	✓		✓
450 x 45	✓		✓
450 x 90	✓		✓
500 x 11.25	✓		✓
500 x 22.5	✓		✓
500 x 45	✓		✓
500 x 90	✓		✓
600 x 11.25	✓		✓
600 x 22.5	✓		✓
600 x 45	✓		✓
600 x 90	✓		✓
750 x 11.25	✓		
750 x 22.5	✓		
750 x 45	✓		
750 x 90	✓		

**NOTES**

1. Mallet fittings available in PN16 rating only

**FLANGE-FLANGE BENDS**

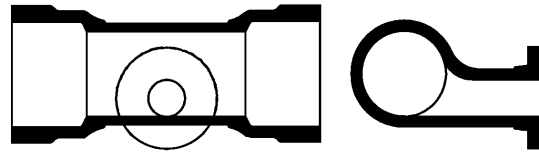


Nominal size DN x degrees	Mallet <sup>1</sup>	Tyco Water	Derwent	Tyco Water Auslite <sup>1</sup>	Dobbie Dico <sup>1</sup>
100 x 11.25	✓	✓	✓		
100 x 22.5	✓	✓	✓		
100 x 45	✓	✓	✓		
100 x 90	✓	✓	✓	✓	✓
150 x 11.25	✓	✓	✓		
150 x 22.5	✓	✓	✓		
150 x 45	✓	✓	✓		
150 x 90	✓	✓	✓		✓
200 x 11.25	✓	✓	✓		
200 x 22.5	✓	✓	✓		
200 x 45	✓	✓	✓		
200 x 90	✓	✓	✓		✓
225 x 11.25	✓	✓	✓		
225 x 22.5	✓	✓	✓		
225 x 45	✓	✓	✓		
225 x 90	✓	✓	✓		
250 x 11.25	✓	✓	✓		
250 x 22.5	✓	✓	✓		
250 x 45	✓	✓	✓		
250 x 90	✓	✓	✓		✓
300 x 11.25	✓	✓	✓		
300 x 22.5	✓	✓	✓		
300 x 45	✓	✓	✓		
300 x 90	✓	✓	✓		
375 x 11.25	✓	✓	✓		
375 x 22.5	✓	✓	✓		
375 x 45	✓	✓	✓		
375 x 90	✓	✓	✓		
450 x 11.25	✓	✓	✓		
450 x 22.5	✓	✓	✓		
450 x 45	✓	✓	✓		
450 x 90	✓	✓	✓		
500 x 11.25	✓	✓	✓		
500 x 22.5	✓	✓	✓		
500 x 45	✓	✓	✓		
500 x 90	✓	✓	✓		
600 x 11.25	✓	✓	✓		
600 x 22.5	✓	✓	✓		
600 x 45	✓	✓	✓		
600 x 90	✓	✓	✓		
750 x 11.25	✓	✓			
750 x 22.5	✓	✓			
750 x 45	✓	✓			
750 x 90	✓	✓			

**NOTES**

1. Auslite, Dobbie Dico and Mallet fittings available in PN16 rating only

**SOCKET-SOCKET FLANGE  
SCOUR TEES**

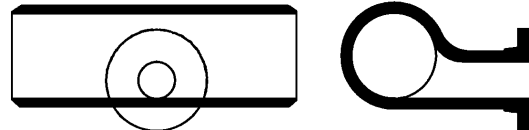


Nominal Size DN x DN x dn	Mallet <sup>1</sup>	Tyco Water	Derwent
150 x 150 x 80	✓	✓	✓
200 x 200 x 80	✓	✓	✓
225 x 225 x 100	✓	✓	✓
250 x 250 x 100	✓	✓	✓
300 x 300 x 100	✓	✓	✓
375 x 375 x 150	✓	✓	✓
450 x 450 x 150	✓	✓	✓
500 x 500 x 150	✓	✓	✓
600 x 600 x 150	✓	✓	✓
750 x 750 x 200	✓	✓	✓

**NOTES**

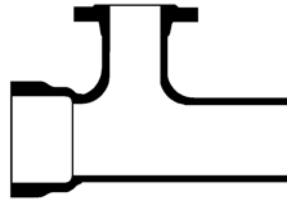
1. Mallet fittings available in PN16 rating only

**SPIGOT-SPIGOT FLANGE  
SCOUR TEES**



Nominal Size DN x DN x dn
150 x 150 x 80
200 x 200 x 80
225 x 225 x 100
250 x 250 x 100
300 x 300 x 100
375 x 375 x 150
450 x 450 x 150
500 x 500 x 150
525 x 525 x 150
600 x 600 x 150
675 x 675 x 150
750 x 750 x 200

SOCKET-SPIGOT-FLANGE  
GAS RELEASE VALVE TEES

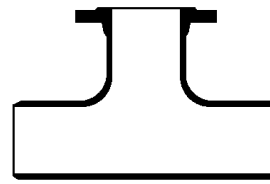


Nominal Size DN x dn x dn	Mallet <sup>1</sup>	Tyco Water	Derwent
100 x 100 x 80	✓	✓	✓
100 x 100 x 100	✓	✓	✓
150 x 150 x 80	✓	✓	✓
150 x 150 x 100	✓	✓	✓
200 x 200 x 80	✓	✓	✓
200 x 200 x 100	✓	✓	✓
225 x 225 x 80	✓	✓	✓
225 x 225 x 100	✓	✓	✓
250 x 250 x 80	✓	✓	✓
250 x 250 x 100	✓	✓	✓
300 x 300 x 80	✓	✓	✓
300 x 300 x 100	✓	✓	✓
375 x 375 x 80	✓	✓	✓
375 x 375 x 100	✓	✓	✓
450 x 450 x 80	✓	✓	✓
450 x 450 x 100	✓	✓	✓
500 x 500 x 80	✓	✓	✓
500 x 500 x 100	✓	✓	✓
600 x 600 x 80	✓	✓	✓
600 x 600 x 100	✓	✓	✓
750 x 750 x 80			
750 x 750 x 100	✓	✓	

NOTES

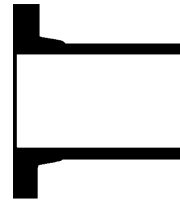
1. Mallet fittings available in PN16 rating only

**SPIGOT-SPIGOT-FLANGE  
GAS RELEASE VALVE TEES**



Nominal Size DN x DN x dn	Tyco Water	Derwent
100 x 100 x 80	✓	✓
100 x 100 x 100	✓	✓
150 x 150 x 80	✓	✓
150 x 150 x 100	✓	✓
200 x 200 x 80	✓	✓
200 x 200 x 100	✓	✓
225 x 225 x 80	✓	✓
225 x 225 x 100	✓	✓
250 x 250 x 80	✓	✓
250 x 250 x 100	✓	✓
300 x 300 x 80	✓	✓
300 x 300 x 100	✓	✓
375 x 375 x 80	✓	✓
375 x 375 x 100	✓	✓
450 x 450 x 80	✓	✓
450 x 450 x 100	✓	✓
500 x 500 x 80	✓	✓
500 x 500 x 100	✓	✓
600 x 600 x 80	✓	✓
600 x 600 x 100	✓	✓
750 x 750 x 80		
750 x 750 x 100	✓	

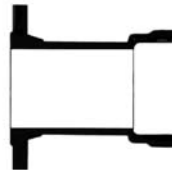
**FLANGE-SPIGOT CONNECTORS**



Nominal Size DN	Mallet <sup>1</sup>	Tyco Water	Derwent	Tyco Water Auslite <sup>1</sup>
100	✓	✓	✓	✓
150	✓	✓	✓	✓
200	✓	✓	✓	
225	✓	✓	✓	
250	✓	✓	✓	
300	✓	✓	✓	
375	✓	✓	✓	
450	✓	✓	✓	
500	✓	✓	✓	
600	✓	✓	✓	
750	✓	✓		

NOTES 1. Auslite and Mallet fittings available in PN16 rating only

**FLANGE-SOCKET CONNECTORS**

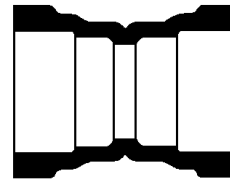


Nominal Size DN	Mallet <sup>1</sup>	Tyco Water	Derwent	Tyco Water Auslite <sup>1</sup>	Dobbie Dico <sup>1</sup>
100	✓	✓	✓	✓	✓
150	✓	✓	✓	✓	✓
200	✓	✓	✓		✓
225	✓	✓	✓		
250	✓	✓	✓		✓
300	✓	✓	✓		
375	✓	✓	✓		
450	✓	✓	✓		
500	✓	✓	✓		
600	✓	✓	✓		
750	✓	✓			

NOTES 1. Auslite, Dobbie Dico and Mallet fittings available in PN16 rating only

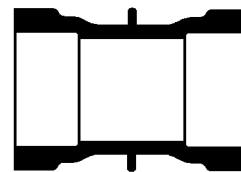


**SOCKET-SOCKET CONNECTORS**



Nominal Size DN	Mallet	Tyco Water	Derwent
100	✓	✓	✓
150	✓	✓	✓
200	✓	✓	✓
225	✓	✓	✓
250	✓	✓	✓
300	✓	✓	✓
375	✓	✓	✓
450	✓	✓	✓
500	✓	✓	✓
600	✓	✓	✓
750	✓	✓	✓

**SOCKET-SOCKET SLIP COLLARS**



Nominal Size DN	Tyco Water (Sliptyt)
100	✓
150	✓

**NOTES**

Sliptyt offered only with thermal bonded polymeric encapsulation utilising polyamide (nylon) being Rilsan T Blue 7411 MAC

**CAPS**



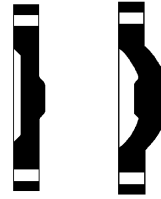
Nominal Size DN	Mallet	Tyco Water	Derwent	Dobbie Dico
100	✓	✓	✓	✓
150	✓	✓	✓	✓
200	✓	✓	✓	✓
225	✓	✓	✓	
250	✓	✓	✓	✓
300	✓	✓	✓	
375	✓	✓	✓	
450	✓	✓	✓	
500	✓	✓	✓	
600	✓	✓	✓	
750	✓	✓		

**PLUGS**



Nominal Size DN	Mallet	Derwent
100	✓	✓
150	✓	✓
200	✓	✓
225	✓	✓
250	✓	✓
300	✓	✓
375	✓	✓
450	✓	✓
500	✓	✓
600	✓	✓
750	✓	

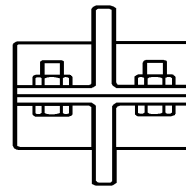
**STANDARD PRESSURE BLANK FLANGES**



Nominal Size DN	Tyco Water
100	I
150	I
200	I
225	I
250	I
300	I
375	I
450	I
500	I
600	I
750	

I = Interim approval

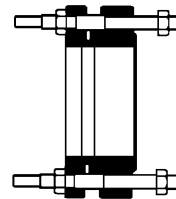
**PUDDLE FLANGES**



Nominal Size DN	Tyco Water
80	I
100	I
150	I
200	I
225	I
250	I
300	I
375	I
450	I
500	I
600	I
750	I

I = Interim approval

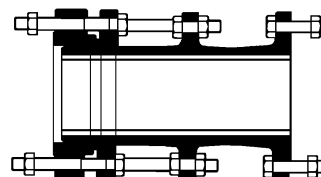
**NON-THRUST DISMANTLING JOINTS**  
*CLASS 16*



Nominal Size DN	Tyco Water
100	I
150	I
200	I
225	I
250	I
300	I
375	I
450	I
500	I
600	I
750	I

I = Interim approval

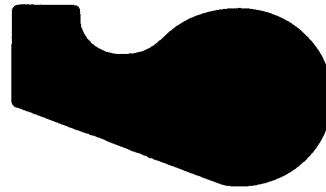
**THRUST DISMANTLING JOINTS**  
*CLASS 16*



Nominal Size DN	Tyco Water
100	I
150	I
200	I
225	I
250	I
300	I
375	I
450	I
500	I
600	I
750	I

I = Interim approval

SPIGOT-SOCKET ELASTOMERIC SEALS

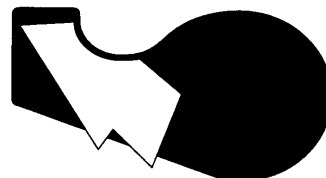


Nominal Size DN	Mallet (Ludowici)	Tyco Water (Gulf)	Derwent (Gulf)	Dobbie Dico (Gulf)
80	✓	✓	✓	✓
100	✓	✓	✓	✓
150	✓	✓	✓	✓
200	✓	✓	✓	✓
225	✓	✓	✓	
250	✓	✓	✓	✓
300	✓	✓	✓	
375	✓	✓	✓	
450	✓	✓	✓	
500	✓	✓	✓	
600	✓	✓	✓	
750	✓	✓		

NOTES

1. Seal manufacturers are shown in brackets.

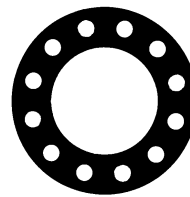
SPIGOT-SOCKET RESTRAINING ELASTOMERIC SEALS



Nominal Size DN	Tyco Water <sup>1,2</sup> (Tyton-Lok)
80	
100	✓
150	✓
200	I
225	I
250	I
300	I
375	I

I = Interim approval

**FLANGE ELASTOMERIC SEALS**



Nominal Size DN	Mallet (Ludowici)	Tyco Water (SDQ)
80	✓	✓
100	✓	✓
150	✓	✓
200	✓	✓
225	✓	✓
250	✓	✓
300	✓	✓
375	✓	✓
450	✓	✓
500	✓	✓
600	✓	✓
750	✓	✓

**NOTES**

1. Seal manufacturers are shown in brackets.

**JOINTING LUBRICANT**



Size	Tyco Water (Thomas Grozier)
500g	✓
1kg	✓
2kg	✓
4kg	✓

**NOTES**

1. Lubricant manufacturers are shown in brackets.

**EXTERNAL CORROSION PROTECTION  
POLYETHYLENE SLEEVING & PETROLATUM SYSTEM**  
REFER TO SECTION SPO 04 CORROSION PROTECTION