



# SINTAKOTE<sup>®</sup>

# FITTINGS

STEEL PIPELINE SYSTEM

# FITTINGS FOR ANY APPLICATION

## GENERAL DESCRIPTION

Pipe fittings are components used to connect sections of straight pipes. The functions of pipe fittings are imperative and essential for a complete pipeline system. These functions include connection, change of direction, change in pipe diameter, flow regulation, splitting flow and terminating pipe runs.

## MILD STEEL FITTINGS

Steel Mains has the capability of manufacturing and supplying a full range of steel fittings, including fittings fabricated from pipe and/or cylinders rolled and welded from plate steel up to a thickness of 40mm.

Steel Mains SINTAKOTE® Fittings are manufactured to suit the specific needs of customers and a wide range of steel fabricated fittings can be supplied in addition to the standard range. For example expansion joints, purpose designed dismantling joints for high pressure applications and complex fittings such as bifurcates and trifurcates. Fittings are manufactured from pre-tested steel and are typically coated in SINTAKOTE® and cement mortar lined with welded, flanged or SINTALOCK® joints.

## FLEXIBILITY OF STEEL MAINS FITTINGS

Each fitting is for the application with appropriate reinforcement. Where required, Steel Mains staff work with pipeline designers to maximise the efficiency of the system in the design phase, and Steel Mains supply complete pipe and fittings solution to allow for efficient time saving installation.

The SINTAKOTE steel pipeline system is available across a full-size range. All fittings can be tailor-manufactured to any specified dimensions, pressure rating and joint type. Technical assistance is readily available on the manufacture and suitability of fittings solutions.

The flexibility of steel construction allows multiple components to be combined into single transportable combinations, saving installation times along with the additional economies gained by eliminating jointing materials, ie, weld collars, nuts, bolts and flanges, etc.

### TECHNICAL DATA

Size Range

114mm to 2500mm diameter

Operating Pressures

Up to 6800kPa (Diameter Dep.)

Maximum Velocities

6m/s for cement lined fittings

Operating Temperatures

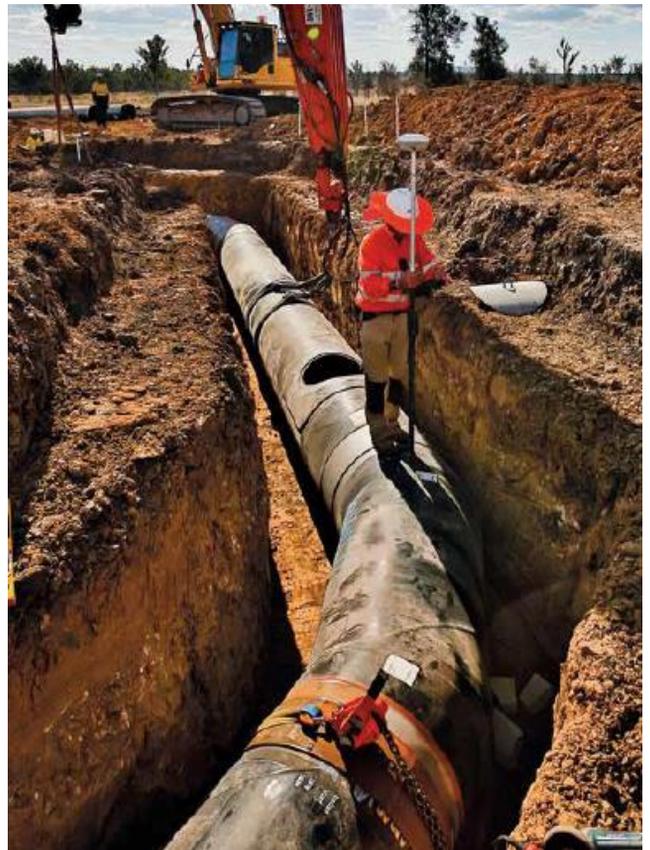
-40°C to 70°C

Certifications

AS/NZS ISO 9001

AS/NZS 4020

AS 1579 Standards Mark



# AUSTRALIAN MADE FITTINGS

## AUSTRALIAN MANUFACTURING

Steel Mains is committed to supplying products fully manufactured in Australia to meet Australian Standards and conditions. Since its founding, Steel Mains has remained committed to meeting the increasing demand for premium quality and innovation in all aspects of operations. Many years of experience and use of advanced technology in product development and manufacturing has resulted in high quality and durable products that comply with Australian Standards.



## LOCAL CONTENT

Materials and labour required to manufacture pipe fittings are sourced locally, ensuring 98% local content. Local manufacture and product Standardsmark certification provide customers with that additional supply security, with all aspects of our manufacturing meeting Australian quality standards; providing streamlined pipeline solutions that aim to maximise a strong return on your investment.



## FITTINGS CAPABILITIES

Manufacturing equipment and machinery capabilities for fittings include:

- Plate Rolling
- Pipe and Fittings Fabrication
- End Forming
- Grit Blast and Painting Equipment
- Cement Mortar Lining Equipment
- Skilled Hand Lining Operators
- Sintakote application equipment – For both bare fittings and reinstatement of fabricated fittings from coated pipe



# FITTINGS FOR ANY APPLICATION

## SINTALOCK® FITTINGS

Steel Mains range of SINTALOCK external welded restraint, rubber ring joint steel pipeline fittings components brings new economies to fittings manufacture and field construction.

SINTALOCK fittings allow construction of a complete rubber ring jointed pipeline system. Bends are incorporated with a Plain End with Weld Collar on one end for pipe coming into the bend and with a SINTALOCK socket end on the downstream end which is then welded to the spigot end of a specially prepared pipe with a SINTALOCK spigot end and with a standard SINTAJOINT® socket end to allow for change back to unrestrained SINTAJOINT Rubber Ring Joint pipe. Tees and valve and scour offtakes are available as standard system components.

This eliminates the requirement for cement mortar lining reinstatement at the bend while taking full advantage of the benefits of SINTAJOINT and SINTALOCK. Tapers, reducers and bends can be incorporated with SINTALOCK joints.



## HOCKEY STICK BENDS

Hockey Stick SINTAJOINT and SINTALOCK pipes feature a rubber ring jointed socket with a one cut bend at angles up to 6° (dependent on pressure and depth of cover). Coupled with the available angular deflection in the joint, (up to 3°), significant changes in direction can be accommodated using several 'Hockey Sticks' in series. Two cut and three cut bend fittings are also available, as shown in accompanying photo.



## BENDS ON FULL LENGTH PIPE

Bends can also be fabricated on the end of full-length pipes or shorter length pipes.

Pipeline bends can be supplied to any angle from 1° to over 90°. Tee branches can be supplied in any standard diameter not larger than the body of the tee. Branches may be flanged or provided with either spigot or socket for rubber ring jointing to suit the demands of your pipeline system.

Deflection angles can be supplied in any angle, however transport needs to be considered in respect to wide loads etc.

AWWA MII Design Manual provides methodology for maximum permissible angles. Refer to Steel Mains Design Manual for permissible angles for SINTAJOINT Hockey Sticks.



# COATINGS

## SINTAKOTE®

SINTAKOTE is a medium density polyethylene which is applied to the pipe fittings by a fusion bonding process. SINTAKOTE is the recommended external corrosion protection coating for pipe and fittings and complies to AS 4321.

## DEVELOPMENT

SINTAKOTE was developed by Steel Mains in 1970 in conjunction with Australian Water Authorities, to overcome pipeline failures due to inadequate coating systems. A worldwide research project was undertaken by Steel Mains to find the best coating system available which led to the development of SINTAKOTE. Further developments have maintained SINTAKOTE as a world leading coating and lining system for steel water pipelines.

## BENEFITS

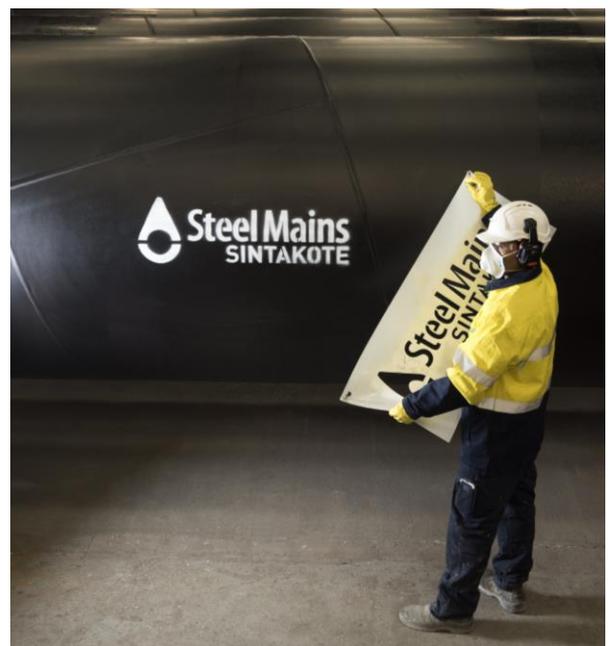
The fusion-bonding process provides a continuous and holiday free coating, with a smooth surface, ideal for above and below ground applications even in aggressive soils and when exposed to direct UV sunlight.

Features of the coating include:

- Excellent adhesion
- High impact and load resistance
- Excellent chemical resistance
- High dielectric strength
- High electrical resistivity
- Low water absorption
- Resistance to soil stresses
- Wide service temperature range - temperatures from minus 40°C to plus 70°C
- Inbuilt ultraviolet stabilizer

## STANDARDS

SINTAKOTE is supplied in accordance with AS 4321 - Fusion-bonded medium density polyethylene coating and lining for pipes and fittings.



# LININGS

## CEMENT MORTAR LINING

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. In Australia, cement mortar linings are used in steel fittings and main line pipe as well as in pump stations. Alternative lining systems are available where required. The dense mortar produced by our centrifugal lining process offers good chemical resistance to potable waters and can also be used in saline and wastewater applications.

Cement mortar linings using General Purpose (GP), General Blend (GB), Sulfate Resistant (SR) and Calcium Aluminate (CA) cement are available.

## CORROSION PROTECTION

Cement mortar linings provide the required standards of corrosion protection performance, at low cost, over long periods of service in potable water applications. Cement mortar linings provide active protection of the steel pipe by creating a high pH environment, typically pH12, at the steel-mortar interface. At Ph values above approximately 9, a stable hydroxide film is formed on the inside steel surface. While this passive film remains intact no corrosion occurs and can be expected to achieve a service life well in excess of 100 years.

Cement mortar linings are also used for wastewaters and saline waters. In these cases Steel Mains can assist designers with specifications for special cement lining and treatment to suit water chemistry and required design life. High alumina cements are often required for aggressive sewerage applications.



# SINTAKOTE® BENDS

SINTAKOTE Bends for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Bends are simply a fitting that allow a pipe to flow in a direction other than in a straight line.

Bends are available across a full-size range and can be tailor-made to suit specific design parameters.

Bends are generally manufactured from pipe depending on diameter internal pressure and wall thickness required. AWWA Manual MII pipe design manual describes methodology for design.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.

## BEND TYPES

Due to the wide range of design possibilities applicable to steel pipe + fittings, bends can be supplied in any angle rather than just in standard (11°, 22.5°, 25°, 45° or 90°)

One cut mitred bends are generally used for bends up to and including 22.5 degrees.

Two cut mitred bends are generally used for bend angles from 22.5 to 45 degrees.

Three cut mitred bends are generally used for bend angles above 45 to 90 degrees.

Four cut or more mitre (if required) cut bends are also available for bend angles above 67.5° to 90° bends when the bend radius due to flow is required to be more gradual. Four cut bends are also available for sizes smaller than 67.5°, however these are not common.

Bends are generally manufactured with plain ends for jointing with weld collars. Bends are also able to be supplied with specialised ends such as Spherical-Slip in Joint and Ball & Socket Joint ends or SINTALOCK® and SINTAJOINT® rubber ring joint ends.

Please refer to Steel Mains Bends Technical Datasheet and Design Manual for more information.



# SINTAKOTE® TEES

SINTAKOTE Tees for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Tees are used in pipelines for a number of reasons such as future service connections, manhole entry, connections for air release valves.

Tees are available across a full-size range and can be tailor-made to suit specific design parameters.

Tees are generally manufactured from pipe depending on diameter internal pressure and wall thickness required.

Stresses on straight fittings tee differ from those of straight pipe. Tees may require additional reinforcement by means of crotch plates, or wrapper plates.

AWWA Manual MII pipe Design Manual provides methodology for design.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.

Tees can be manufactured with different end types such as Flanged, Plain Ended or with SINTALOCK or SINTAJOINT ends. They are also available with smaller diameter branches such as scours etc.

Tees can also be manufactured on full length pipe, thereby reducing the number of connection points in the pipeline during construction.

Tees are available as Equal Tees (branch size same as main pipe) or Reducing Tees (branch size smaller than main line pipe). A special case of a Tee is a Cross Tee (branch on both sides opposite one another)



# SINTAKOTE® REDUCERS

SINTAKOTE Reducers for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Changes in diameter are accomplished using reducers, placed in the straight section of a pipeline or combined with a mitred bend, tee or a cross. Pipe reducers can be either concentric or eccentric (sometimes called straight back reducers).

Reducers are available across a full-size range and can be tailor-made to suit specific design parameters.

Reducers are generally manufactured from fabricated plate depending on the dimensions required. The fabricated fitting is 100% non-destructively tested and complies with AS 1579.

Reducers can be fitted with a wide range of pipe ends and may include thrust or puddle flanges. They can also be supplied with an anchor ring for use in a concrete wall or concrete anchor block.

Reducers if manufactured from plate that is not pressure tested will have a pressure rating based on 50% of specified minimum steel yield strength per requirements of AS 1579.

AWWA Manual M11 pipe Design Manual describes methodology for design.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.



# SINTAKOTE® SPOOLS

SINTAKOTE Spools for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Spools are short pipe lengths with Table Flanges on one or both ends. They may also be supplied with thrust flanges or anchor rings for use in a concrete wall (typically pump stations or valve chambers) or a concrete anchor block.

Spools are available across a full-size range and can be tailor-made to suit specific design parameters.

Spools are generally manufactured from pipe, depending on diameter internal pressure and wall thickness required.

AWWA Manual M11 pipe Design Manual provides methodology for design.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.

Steel Mains also supplies full length pipe with Table Flange Ends.

Photos shown are a standard spool at top of page and lower photo exhibits a “S” bend with a Table Flange and a Non-Thrust “Weep Flange” and plain end pipe – similar to a spool pipe.



# SINTAKOTE® COMBINATIONS

SINTAKOTE® Combination fittings are available across a full-size range and can be tailor-made to suit specific design parameters.

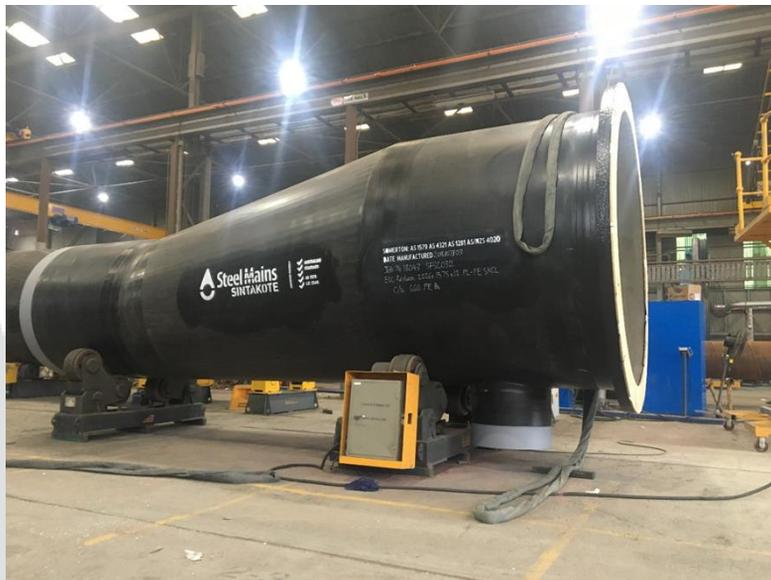
Combinations are multiple fittings, joined at the manufacturing facility, to reduce on-site assembly, welding and reinstatement. The limitation on 'Combined Fittings' is determined by overall dimensions for transport purposes.

Typical Combination fittings include manifolds, combination "multiple plane (X,Y,Z)" bend with a branch offtake, reducers with a branch and bend incorporated.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579. SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.

SINTAKOTE Combinations for Steel Pipeline Systems are suitable for use with potable water and waste water in above and below ground applications.



# SINTAKOTE® ANGLE TEES

SINTAKOTE Angle Tees for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Angle Tees are used in pipelines.

Angle Tees or Laterals are available across a full-size range and can be tailor-made to suit specific design parameters.

Angle Tees are generally manufactured from pipe, depending on diameter internal pressure and wall thickness required.

Stresses on Angle Tee fittings differ from those of straight pipe. Similar to Straight Tees, Angle Tees may require additional reinforcement by means of crotch plates. Wye branches are available with a minimum angle of 30° upwards.

AWWA Manual MII pipe design manual provides methodology for design.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.

Angle Tees can be manufactured with different end types such as plain end. They are normally supplied as plain ends for welding into the pipeline.

Angle Tees are available with lateral branches of equal diameter to the mainline pipe or with lateral branches with smaller diameter than the main pipe.

Angle Tees can also be manufactured on full length pipe.



# SINTAKOTE® BIFURCATES

SINTAKOTE Bifurcates for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Bifurcates are available across a full-size range and can be tailor-made to suit specific design parameters.

Bifurcates are also known as Y-pieces or Wye-pieces. They are a special type of branch used to split or join flow in a pipeline. They may be specified with plain or flanged ends. Bifurcates are manufactured from fabricated plate and/or pipe depending on diameters required. The angle between branches is 45 degrees. They are reinforced with crotch plates.

AWWA Manual II provides methodology for design.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.



# TABLE FLANGES

Flanged Joints for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Flanged Joints are used mainly for above-ground applications, e.g. pumping stations, water and sewerage treatment plants and for industrial pipework. They are also used to facilitate the installation + removal of valves in SINTAJOINT® and welded SINTAKOTE® pipelines and for valve bypass arrangements.

The SINTAKOTE Steel Pipeline System's flanges are available across a full-size range and are specifically manufactured to match the steel pipe or branch shell diameter nominated.

Flanges are generally manufactured in accordance with AS 4087 or AS 2129 depending on the design requirements. For flanges larger than DN1200, these are normally supplied in accordance with ISO7005-1. Steel Table flanges are supplied as Raised Face Flanges for all pressure classes: Class 16, Class 21 and Class 35.

Flanges to alternative or international standards are also manufactured by Steel Mains, however, please consult with Steel Mains prior to placing orders to confirm availability.

Tailor made flanges can also be manufactured to meet specific design requirements. These are designed to ensure compatibility with both mating surfaces and bolting requirements.

- Consult the SINTAKOTE Steel Pipeline Systems Handling and Installation Manual for recommended installation information
- Check with Steel Mains on material availability prior to placing orders

For above-ground applications, table flanges are normally coated in Tankguard 412 – a two component solvent free polyamine cured epoxy coating. Epoxy is applied to the front face bolting surface (but not sealing surface) + back face of the flange.

For buried applications, table flanges are generally coated with an inorganic zinc corrosion protection coating. Once installed they are wrapped with a mastic and petrolatum tape system. Tankguard together with petrolatum tape system provides a superior coating system. SINTAKOTE is not used as the sealing face or bolting face of a Table Flange as there is risk of damage to the coating.



# WELD COLLARS

The SINTAKOTE Steel Pipeline System has weld collars available across a full size range and can be tailor-made to suit specific design parameters.

Weld Collars are generally manufactured from steel plate and supplied in accordance with AS/NZS 3678 or AS/NZS 3679, subject to size.

Weld collars are generally supplied as uncoated, plain rings and are normally supplied at the next standard plate thickness greater than the pipe shell. If required, the following options are available:

- Clamping lugs and bolts to assist in onsite installation
- Test holes and plugs to facilitate onsite pneumatic testing of the joint
- Barrier coating system to provide temporary corrosion protection
- Weld bevel preparations

Various material grades are available to be compatible with mating product.

## WIDTH

Typical weld collar widths are:

Pipe Diameter	Width (mm)
114-168	100
>168-800	150
>800-1200	200
>1200	250



# SINTAKOTE® STEPOVERS

SINTAKOTE Pipe Stepovers for Steel Pipeline Systems are suitable for use with potable water and wastewater in above and below ground applications.

Pipe Stepovers are commonly used to enable a pipeline to cross over other existing services that are located in the way or to cross over some other existing infrastructure.

SINTAKOTE Pipe Stepovers are available across a full-size range and can be tailor-made to suit specific design parameters.

Pipe Stepovers are generally manufactured from pipe, depending on diameter and wall thickness required.

They are normally made to match the pipeline wall thickness. Hoop stresses at the bend can decrease the operating pressure of the pipe used to manufacture a steper and therefore an increased steel thickness may need to be taken into account.

Stress concentration factors need to be taken into consideration. AWWA Manual M11 provides methodology for design.

The fabricated fitting is 100% non-destructively tested and complies to AS 1579.

SINTAKOTE is the recommended coating for pipe and fittings and complies to AS 4321. Alternative coatings are available where reduced operating life of the pipeline is permissible.

Cement Mortar Lining (CML) is the recommended lining for the Steel Pipeline System pipe and fittings and complies to AS 1281. Alternative lining systems are available where required.



# SINTAKOTE® TEMPORARY ACCESS CLOSURES

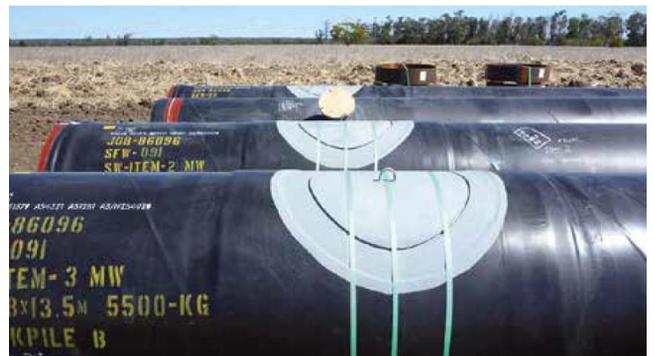
SINTAKOTE Temporary Access Closures for Steel Pipeline Systems are suitable for use with potable water and waste water in above and below ground applications (only applies to the SINTAKOTE recommended coating and lining systems – please consult the SINTAKOTE Steel Pipeline System Design Manual for further details).

Temporary access manways are typically used in large diameter long length pipelines to provide entry points at strategic locations to allow construction workers to enter the pipeline and effect the internal welding and cement mortar lining reinstatement of the joints. These entry points allow for the continuous laying of pipe without relying on entry to the pipeline from an end.

SINTAKOTE Temporary Access Closures provide a pipeline access opening of approximately 580mm in diameter and are specifically manufactured to match the steel pipe diameter nominated. They provide:

- Low cost pipeline access solution during pipeline construction
- Can be retrofitted to provide pipeline access for maintenance
- Maintains the internal corrosion protection integrity when closed
- Generally manufactured in accordance AS 1579 depending on the design requirements
- Factory fitted to the pipe at time of purchase to comply with nominated operating requirements
- Can be supplied for on-site fitting to meet specific requirements

Australian Patent.



# COMPACT DISMANTLING JOINT

Steel Mains' Compact Dismantling Joint design is highly advanced with upgraded features.

The length of the Dismantling Joint is now shorter compared to previous dismantling joint designs, enabled by the Integrated Seal Design and reduced thickness of the Sealing Flanges. The joint can be safely installed in tight and constricted locations or where space is at a premium. This provides significant benefits over all other types of dismantling joints. It allows the pipe designer more options during the planning stage and provides for easier maintenance programs for the installation removal of pumps, valves flow meters, flanged pipe + fittings. Compact Dismantling Joints are ideal for water and butterfly valves

The complete assembly is sandwiched in compression between the Pipe Flange and the Pipeline Component making it one of the easiest dismantling joints to install and remove, saving time and money.

Steel Mains' new and improved unique patented\* Compact Dismantling Joint features the following benefits over existing designs:

- Reduced mass for easy handling
- 100% restrained - External flange bolts "sandwich" the Compact Dismantling Joint
- Significantly reduced length requirements
- Easy installation and removal for servicing pipeline components
- Angular misalignment tolerance
- Integrated effective sealing system activated by compression of compression bolts
- Suitable for high pressure applications
- Compression bolts and nuts in 316 stainless steel for superior corrosion protection
- Fusion bonded epoxy corrosion protection
- Compression bolts independent of the tie rods compress the gasket ensuring long term sealing performance that is not affected due to any external loading

## TECHNICAL DATA

Size Range  
100mm to 2400mm

Rated Pressures  
PN16 and PN35

Temperature Range  
-40°C to 70°C

Certifications  
Certified to AS/NZS  
4020 – Suitable for  
contact with drinking  
water

Australian Patent. International Patent Pending.

For more detailed information, please refer to the Compact Dismantling Joint Datasheet.



# TRADITIONAL DISMANTLING JOINTS

Dismantling Joints are traditionally used to provide for easier installation and maintenance of valves in valve chambers or valves and pumps in pump stations.

Advantages include:

- Lengths requirements specifically engineered to customer's requirements
- Flanges to suit specific pressure rating
- Longitudinal adjustments facilitates assembly and removal of flanged equipment
- Pipe spigot externally coated with Sintakote®
- Stainless steel sealing sleeve for rubber gasket to maintain high pressures
- Internal cement mortar lining same as pipeline for long term corrosion protection
- Table flanges coated into two part polyamide epoxy
- Tie rods provide high compression loading of the small diameter 'o' ring gasket seal

Steel Mains also manufactures highly engineered type traditional Dismantling Joints in sizes from DN500 to DN2400. These are available in thrust type and non thrust type.

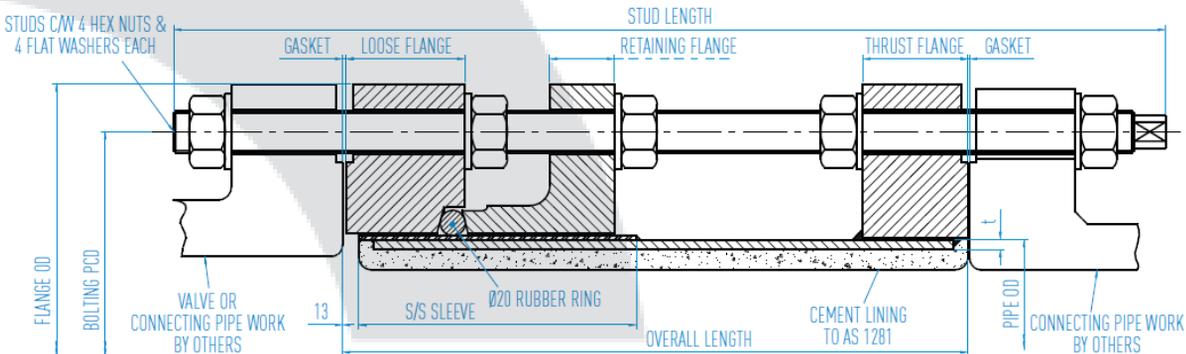


FIGURE 1 - DISMANTLING JOINT – THRUST TYPE C/W FIXED FLANGED

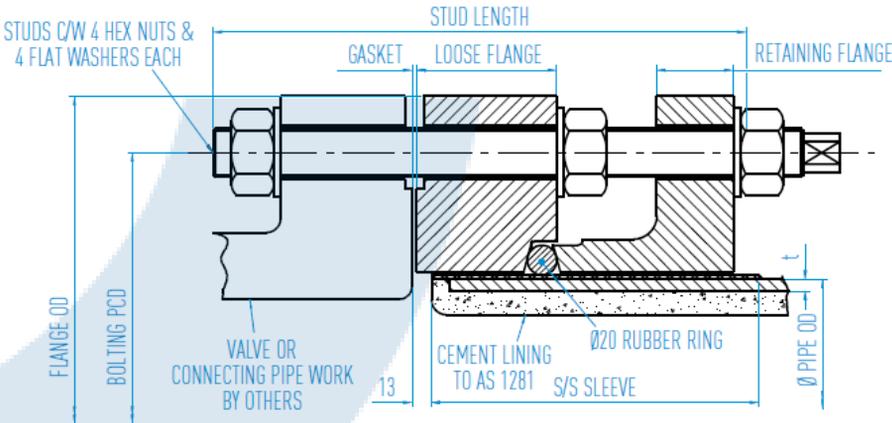


FIGURE 2 - DISMANTLING JOINT – NON THRUST TYPE

# EXPANSION JOINTS

Expansion Joints are installed in above ground long-span steel pipe to allow for expansion or contraction caused by temperature changes. Steel Mains manufactures and supplies fabricated steel mechanical slip type Expansion Joints.

Expansion Joints are manufactured and designed to suit specific site conditions including thermal expansion of the pipe in the pipeline and expansion in supporting structures requiring the same movement in the pipeline it is supporting.

Please refer to the AWWA Manual II for recommendations on placement in the pipeline.

Expansion Joints are available in both flanged ends or plain ends with weld collars.

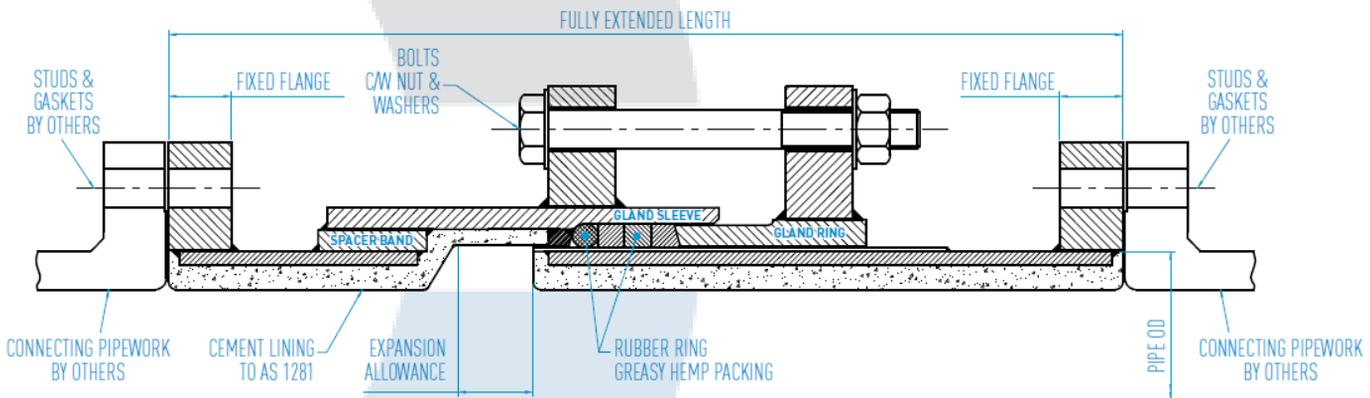


FIGURE 3 - EXPANSION JOINT – FLANGE CONNECTION TYPE

# TYPICAL COMPENSATION CONFIGURATIONS

Compensation requirements are determined by many factors including operating and test pressures, material grades, material thickness (pipe, branch and plate) and the ratio of the branch diameter to the main diameter

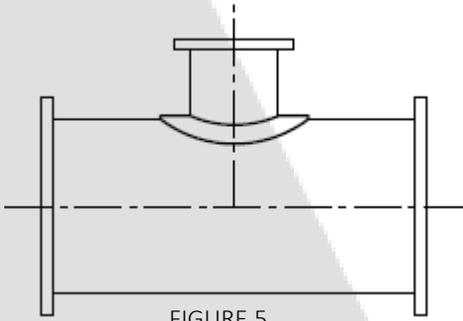


FIGURE 5

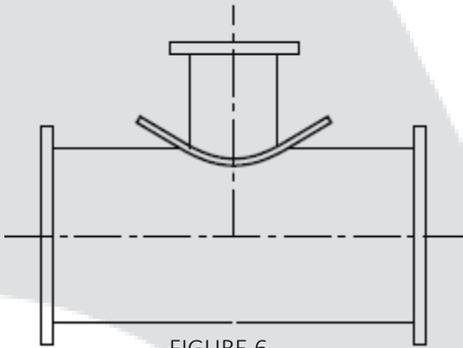


FIGURE 6

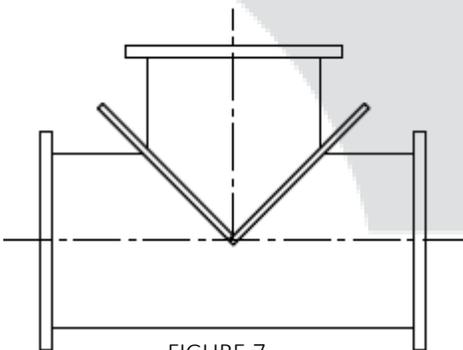


FIGURE 7

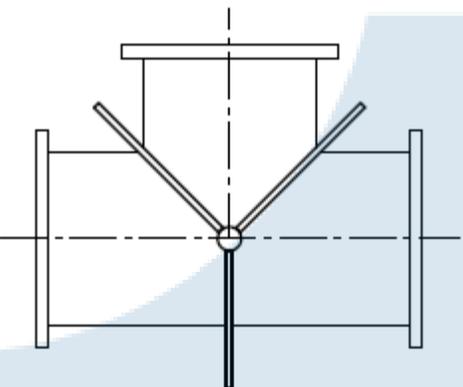


FIGURE 8

# TYPICAL INCORPORATED DETAILS

The figures below depict details for typical items that can be incorporated into fittings, ie, special end types, thrust flanges, or non-thrust “weep” flanges. Thrust flanges are design to suit the maximum test pressure and associated thrust of the pipeline. Puddle flanges are only suitable for controlling the external moisture where pipelines penetrate structures.

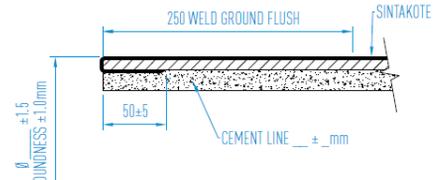


FIGURE 9 – COUPLING END DETAIL

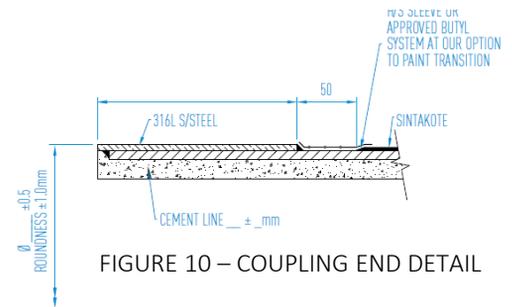


FIGURE 10 – COUPLING END DETAIL

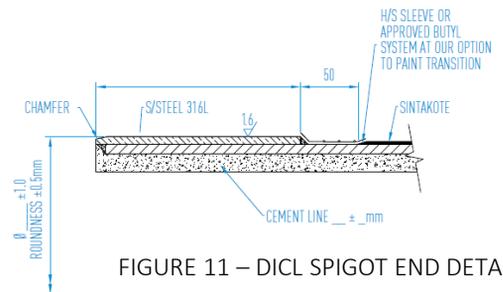


FIGURE 11 – DIEL SPIGOT END DETAIL

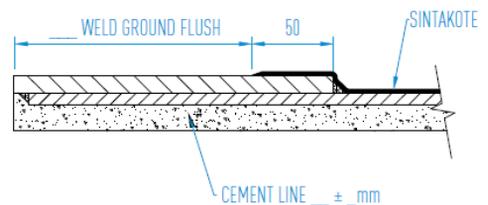


FIGURE 12 – BUILT UP PLAIN END DETAIL USED TO ADAPT TO EXISTING SIZE

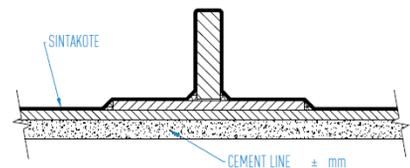


FIGURE 13 – THRUST FLANGED DETAIL

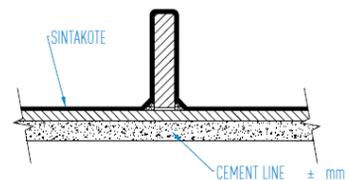


FIGURE 14 – WEEP FLANGE DETAIL

FIGURE 15 – TYPICAL FITTINGS

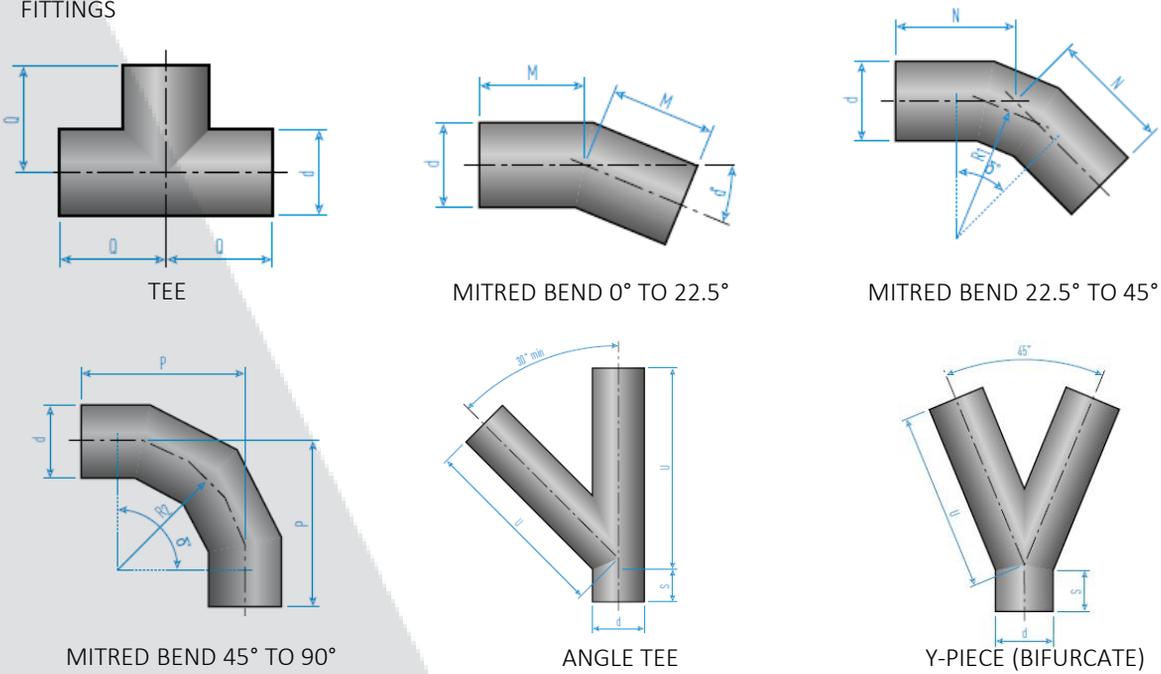


TABLE 2  
FITTINGS CONFIGURATION FOR PREFERRED SIZES AND DIMENSIONS

	Mitred Bends					Tee	Angle Branch		Y - Piece	
	$\delta < 22.5^\circ$	$22.5^\circ < \delta < 45^\circ$	$45^\circ < \delta < 90^\circ$		30° minimum		45°			
	M mm	N mm	R <sub>1</sub> mm	P mm	R <sub>2</sub> mm	Q mm	S mm	U mm	S mm	U mm
200	300	360	500	650	500	325	250	850	250	825
250	375	360	500	650	500	350	250	1,000	250	890
300	375	380	550	700	550	375	250	1,100	250	950
350	450	420	650	800	650	400	250	1,200	250	1,025
400	450	465	750	900	750	425	250	1,300	250	1,100
450	450	485	800	950	800	450	250	1,400	250	1,150
500	450	525	900	1,050	900	475	300	1,500	300	1,225
550	525	565	1,000	1,150	1,000	525	300	1,650	300	1,300
600	525	610	1,100	1,250	1,100	575	300	1,800	300	1,350
650	525	650	1,200	1,350	1,200	625	300	1,900	300	1,425
700	525	690	1,300	1,450	1,300	675	300	2,000	300	1,500
750	600	710	1,350	1,500	1,350	750	300	2,100	300	1,550
800	600	755	1,450	1,600	1,450	775	300	2,200	300	1,600
900	600	815	1,600	1,750	1,600	825	350	2,400	400	1,750
1000	750	900	1,800	1,950	1,800	875	400	2,600	400	1,850
1100	750	980	2,000	2,150	2,000	925	400	2,800	400	2,000
1200	825	1,065	2,200	2,350	2,200	975	500	3,000	500	2,150
1300	825	1,105	2,300	2,450	2,300	1,025	500	3,200	500	2,275
1400	825	1,190	2,500	2,650	2,500	1,075	500	3,400	500	2,400
1500	825	1,270	2,700	2,850	2,700	1,125	600	3,600	600	2,550
1600	900	1,355	2,900	3,050	2,900	1,175	600	3,800	600	2,675
1700	900	1,395	3,000	3,150	3,000	1,225	600	4,000	600	2,800
1800	900	1,500	3,250	3,400	3,250	1,275	600	4,200	600	2,950
1900	900	1,560	3,400	3,550	3,400	1,325	600	4,400	600	3,050
2000	900	1,645	3,600	3,750	3,600	1,375	600	4,600	600	3,200
2100	900	1,725	3,800	3,950	3,800	1,425	600	4,800	600	3,325

- Note. 1. Mitre bend radii designed to restrict stress concentration at inside leg to maximum of 1.25 times hoop stress in pipe.  
 2. Dimension Q may need to be increased when plate reinforcement Q is used or when wide complates are used.  
 3. Steel Mains is capable of manufacturing specific sizes.

# STEEL MAINS FITTINGS PROJECTS

Steel Mains has an extensive history in Australia's major water pipeline infrastructure projects. Steel Mains has supplied a full range of bespoke fittings to many small and major projects in Australia and selected overseas markets. This involvement has not been limited to manufacture and supply. In some instances the design, project management and construction have been Steel Mains responsibility. Think of any recent major water pipeline project and Steel Mains was involved. Either in design, supply, construction or commissioning, and with some projects, all of these functions. For all your water industry pipeline needs Steel Mains has the solutions.

## VIC – MILDURA CENTRAL RISING MAIN– 2019

Steel Mains manufactured a range of fittings for the Lower Murray Water Central Rising Main project. The installation, completed by Jaydo Construction in 2019, involved the supply of various steel fittings ranging in size from 813 to 2244 outside diameter. They included an eccentric reducer 2244 OD to 1750 OD, various 1750 and 1626 OD angle tees, and various large bends in the 1750, 1626 and 972 sizes. These fittings, along with Sintalock Steel Pipes in various sizes, will help provide over 2000 irrigation customers in Mildura vital water supplies for the next 100 years.



## NSW – NORTHERN ROADS STAGE 5 – 2019

The upgrade of the Northern Road is part of the Western Sydney Infrastructure Plan which involves major road and transport linkages to capitalize on the economic gains from developing the Western Sydney Airport at Badgerys Creek and the Western Sydney Priority Growth Area. Steel Mains supplied Diona Construction 2.5km of DN900 Sintalock Pipe and Fittings for the Roads & Maritime Services.



## NSW – WENTWORTH TO BROKEN HILL – 2018

Steel Mains manufactured and supplied over 262 km of 762mm OD Sintajoint RRJ pipe and over 670 fittings for the WaterNSW pipeline delivered and operated by the W2BH consortium. The W2BH pipeline will provide Broken Hill and surrounding communities with critical water supply, which had been suffering from significant numerous cyclic water shortages prior to the construction of the pipeline. These fittings included over 370 special DN100 Air Valve Offtakes mounted RRJ pipes and over 100 special DN250 Scour Offtake mounted RRJ pipes for the project.



# STEEL MAINS FITTINGS PROJECTS



## SA – MORGAN WATER TREATMENT PLANT – 2018

The Morgan Water Treatment Plant Upgrade was a critical project which aimed to enhance the quality of drinking water supplied to over 130,000 regional South Australians. Steel Mains supplied its proprietary Sintakote coating solution on a variety of large size pipes and specials including approx. 400m of 1575 OD pipes with its Ball & Socket jointing technique. The scope of supply also included a wide variety of specials including 1575 OD, 1283 OD stub pipe, wye tees, bends through to a gigantic 2159 x 1575 reducer with all factory made manway offtakes. Steel Mains solution offered the project some significant cost savings through elimination of excessive welding needed for a traditional plain ended jointing system.

## WOLEEBEE CREEK TO GLEBE WEIR - 2013

Steel Mains manufactured and supplied 120 kilometres of large 914-1404mm diameter steel pipe and fittings for SunWater's Woleebee Creek to Glebe Weir Pipeline project. The pipeline will deliver up to 36,500ML of treated CSG water annually to irrigation and industrial customers. A total of 10,000 pipes and 3,500 fittings were delivered on time and on budget.



## VICTORIA DESALINATION PIPELINE - 2010

Persistent severe drought conditions in Victoria, Australia lead to the construction of a state of the art desalination plant and DN 1900, 84km long, welded ball and socket joint, Sintakote® pipeline transporting water from Wonthaggi Desalination Plant to Cardinia Reservoir. Wherever possible fittings were "combined" in the manufacturing facility to minimise the on-site work required, lowering overall project cost.



## SOUTH EAST QUEENSLAND WATER GRID - 2008

The South East Queensland Water Grid consists of the Northern Interconnector Pipeline, the Southern Regional Water Pipeline, the Eastern Interconnector Pipeline and the Western Corridor Recycled Water Scheme. Steel Mains supplied 334km of SINTAKOTE steel pipe and fittings in sizes ranging from DN 800 to DN 1400.



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