



# Hall Longmore

## Corrosion Protection and Jointing Systems for Steel Pipelines

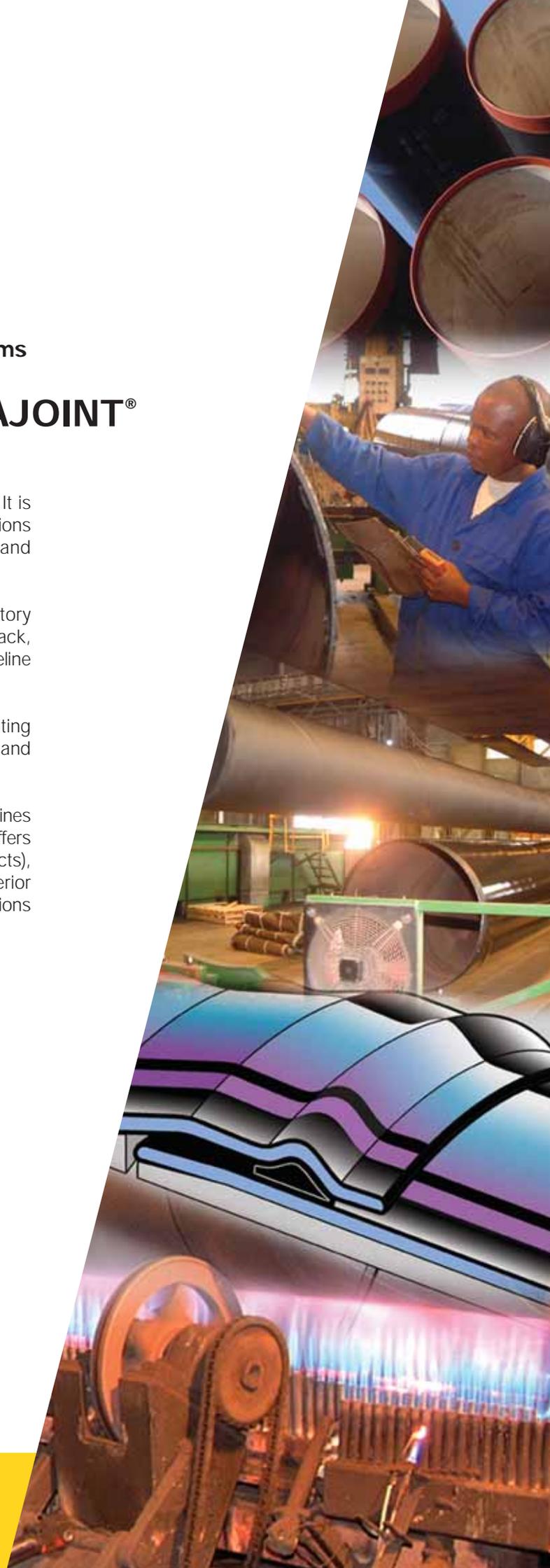
### SINTAKOTE II® and SINTAJOINT®

Steel piping is synonymous with strength and reliability. It is often the material of choice where tough operating conditions must be met and exceeded to achieve high reliability and resistance to failure.

Traditional coatings have been criticised for unsatisfactory performance with regard to mechanical and chemical attack, resulting in corrosion, the most serious threat to steel pipeline lifespan and integrity.

SINTAKOTE II® medium density black polyethylene coating provides a cost-effective means of mechanical, chemical and corrosion protection.

The SINTAJOINT® system of effecting pipeline joints combines several benefits in one product. This proprietary system offers ease of installation (similar to competing non-steel products), the strength and reliability of a steel pipe, and the superior properties of the SINTAKOTE II® coating. In many applications there is nothing to surpass it.



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# SINTAKOTE II®

## Corrosion Protection

With the ever-increasing design life demands placed on traditionally available steel pipe coatings, the need arose for a radical departure from the known. This new coating would have to show dramatic increased performance.

SINTAKOTE II® was introduced into the South African market in the mid-90's after enjoying considerable success in Australia, where it has become the preferred coating for steel pipelines in the water industry. Since then, what used to be a low-density polyethylene coating, has been replaced by a medium-density polyethylene coating SINTAKOTE II® offering greater advantages in corrosion protection.

SINTAKOTE II® is applied directly to pipe using a fusion-bonding process. This coating is also known as FBMDPE, or fusion-bonded medium-density polyethylene. Bare steel is first thoroughly cleaned by shot blasting. Pipe is then heated and dipped into a fluidised bed of SINTAKOTE II® powder, which fuses onto the hot surface to a thickness of 1.6 mm – 2.3 mm, depending on pipe size. Studies have shown that a layer of SINTAKOTE II® of just 1 mm thick will combat corrosion and mechanical damage effectively.

The proprietary formulation of the polyethylene powder has been developed with appropriate additives not only to ensure error-free factory application, but also to ensure long-term durability of the coating. These additives include ultra-violet stabiliser and anti-oxidants.

Strict quality control is maintained through routine testing of yield strength, elongation, density, thickness, adhesion and coating continuity. Quality assurance is in accordance with ISO 9001 for which Hall Longmore has official certification.

SINTAKOTE II® is used as a coating on pipes in below-ground as well as above-ground applications, including installations where pipes must be jacked (e.g. road and rail crossings), or for piles and structural tubulars in highly corrosive environments.

Outstanding features of SINTAKOTE II® include:

- Low water absorption
- Excellent adhesion to steel surfaces
- High impact, load and soil stress resistance
- Ability to accept pipe bending without damage to coating
- High dielectric strength and electrical resistivity
- Wide service temperature range (-40°C to +70°C)
- Low CP current requirements (typically <5 A/m<sup>2</sup>)



**Shot blasting**



**Heating**



**Dipping**

# SINTAKOTE II® TECHNICAL DETAILS

Characteristic	Test Standards	Typical Test Results
COLOUR		MATT BLACK
COATING MATERIAL (POLYETHYLENE COMPOUND)	AS 1193 AS 4131	POLYOLEFIN POLYMER BASE, ANTIOXIDANTS, CARBON BLACK
THICKNESS (DEPENDENT ON PIPE SIZE)	AS 4321-1995	1.6 mm - 2.3 mm
OPERATING TEMPERATURE RANGE	AS 4321-1995	-40°C to +70°C
MELTING TEMPERATURE		128°C
WATER ABSORPTION		<0.1% WEIGHT AFTER 100 DAYS at 23°C
PENETRATION RESISTANCE	AS 4321-1995	<0.15 mm at 23°C and 10 MPa
TENSILE STRENGTH at YIELD	AS 4321-1995 SABS 1641:1995	15 MPa to 18 MPa 15 MPa to 18 MPa
ENVIRONMENTAL STRESS CRACKING RESISTANCE	AS 4321-1995 ASTM D1693 SABS 1641:1995	F50>100 hours F50>100 hours
DENSITY	AS 1193 ISO 1183	>920 kg/m <sup>3</sup> >920 kg/m <sup>3</sup>
IMPACT RESISTANCE (FALLING WEIGHT TEST)	AS 4321-1995 ASTM G14	>18 J at 23°C
BOND STRENGTH / ADHESION	AS 4321-1995 SABS 1641-1995 DIN 30670-1991	6 N/mm to 10 N/mm at 23°C 6 N/mm to 10 N/mm at 23°C 4 N/mm to 8 N/mm at 50°C
FRICTION COEFFICIENT		0.1-0.3
DIELECTRIC STRENGTH		>15 kV/mm
CATHODIC DISBONDMENT	AS 4321-1995 ASTM G8	<15 mm
ELONGATION (DUCTILITY)	AS 2518-1991	330%-500%
SHORE HARDNESS D (INDENTATION)		60

## SINTAJOINT® Range

Wall Thicknesses	Maximum Working Pressure on SintaJoint® (RRJ) in Bar																			
	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1400				
12	40											36	33	30	26					
10	40											31	30	27	25	21				
8	40											37	35	31	28	25	23			
6	40											38	35	32	30	28	26	23	21	
4.5	40											38	35	32	29	27	25	23		
Nominal Bore (Ømm)	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1400				

# SINTAJOINT®

## Jointing Systems

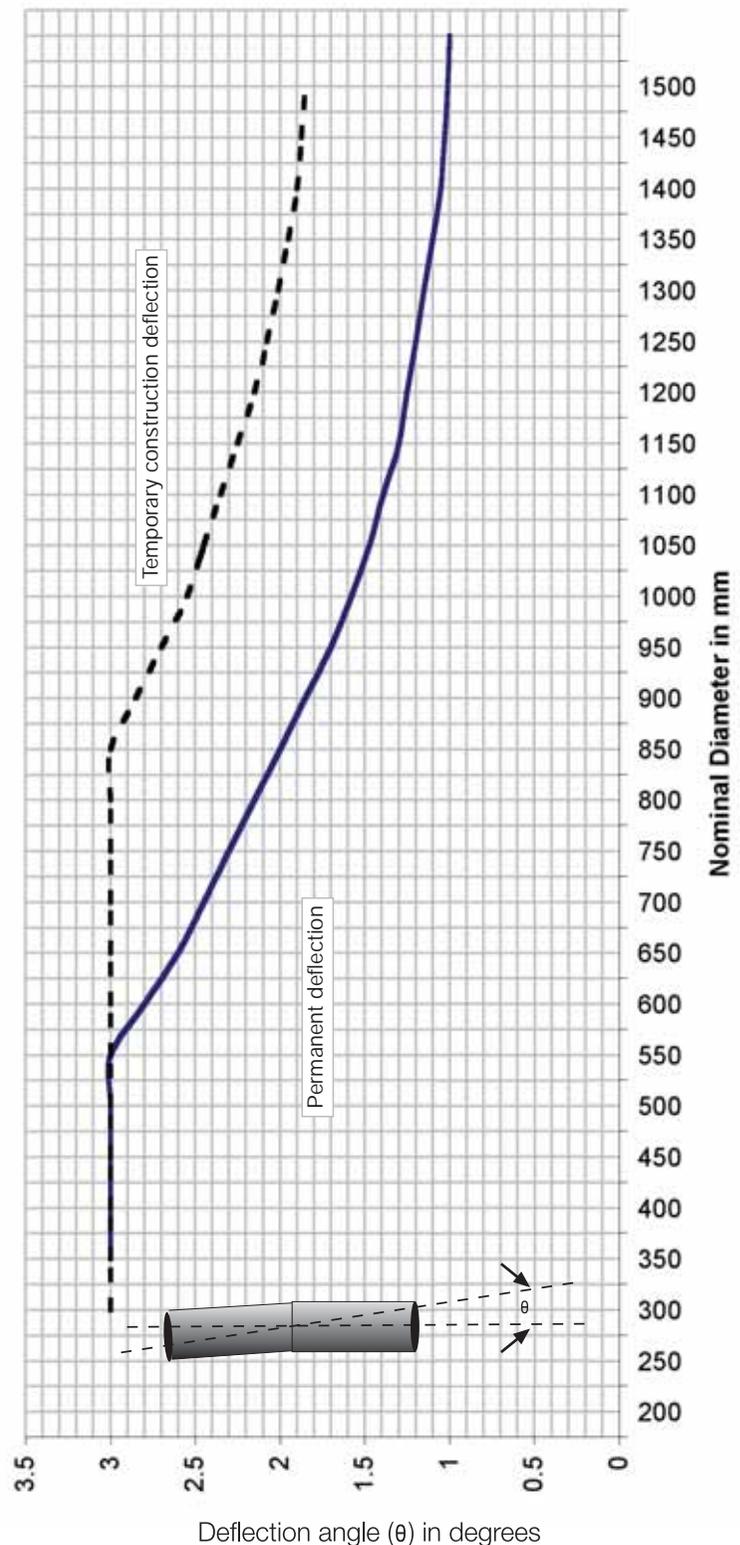
Suitable for both buried and above-ground installations carrying pressurised potable water, the SINTAJOINT® jointing system is particularly effective in sizes from 324 mm to 1420 mm outer diameter.

Also known as a Rubber Ring Joint (RRJ), this patented system consists of a specially-formed spigot and socket which, when pulled together, compresses a natural rubber O-ring between them providing a highly effective seal.

Full corrosion protection of pipes is achieved by extending the polyethylene coating around both the spigot and socket ends to underlay the cement mortar lining.

Allowable angular deflection of joints of up to 3°, depending on pipe diameter, presents the possibility of eliminating certain bends at the design stage.

As each pipe is insulated from the adjoining length by the rubber ring, the need for cathodic protection, on some pipelines, is eliminated. However, continuity can be achieved if cathodic protection is required.

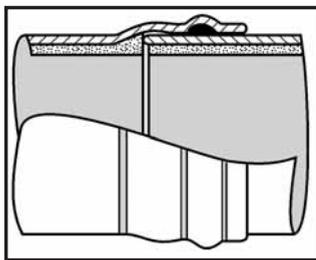


SINTAJOINT® RRJ angular deflections

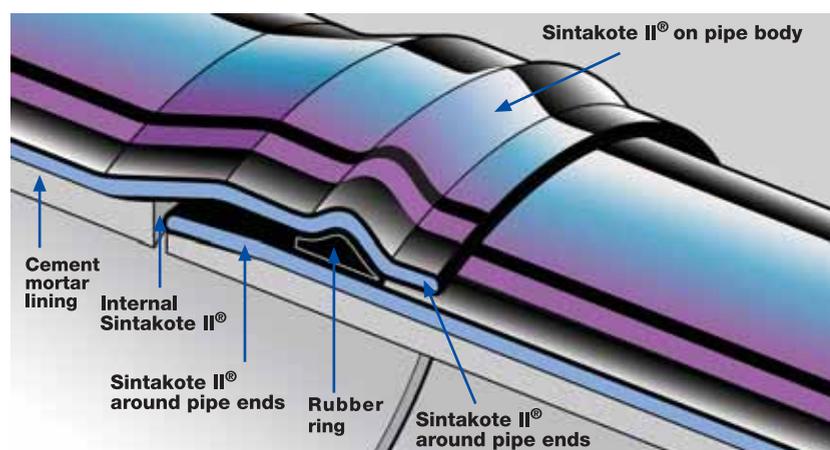
Additional advantages of SINTAJOINT® over welded joints include:

- Faster laying rates.
- Less field plant, maintenance and skilled personnel on site.
- No field wrapping or reinstatement of corrosion protection at joints.
- Joints maintain full seal up to pressures that would rupture the body of the pipe, even with angular rotation.
- No need to X-ray pipe joints.
- Local labour and small contractors can be trained to lay pipes easily.

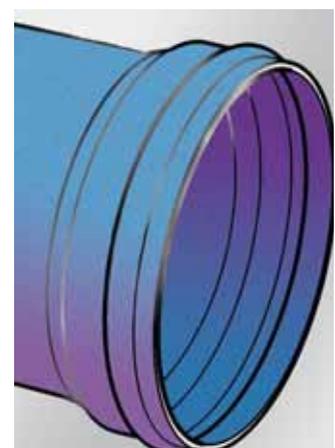
Apart from the SINTAJOINT® /RRJ, standard bevelled pipe ends for butt welding and belled-end joints of socket and spigot joints for fillet-welding are offered with the SINTAKOTE II® coating.



**SINTAJOINT® (rubber ring joint)**



**SINTAJOINT® Fully Assembled**



# SINTAJOINT®

## Installation Methods



Above-ground installation



Buried installation

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