

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

## **Pressure Sewerage Products – Corrosion Protection**

### **Section SPO 04**

<b>SPECIFICATIONS</b>		<b>A</b>	
	SPO 04-S1	POLYETHYLENE SLEEVING FOR DI PIPE AND FITTINGS	A
	SPO 04-S2	ADHESIVE TAPE FOR SECURING POLYETHYLENE SLEEVING	A
	SPO 04-S3	STRAP & BUCKLE FOR SECURING POLYETHYLENE SLEEVING	A
	SPO 04-S4	PETROLATUM TAPE SYSTEM	B
	SPO 04-S5	BITUMEN TAPE SYSTEM	C
	SPO 04-S6	POLYOLEFIN HEAT SHRINK SLEEVES	D
<b>EXTERNAL PROTECTION</b>		<b>1</b>	
	POLYETHYLENE SLEEVING SYSTEM	1	
	PETROLATUM TAPE SYSTEM	1	
	BITUMEN TAPE SYSTEM	1	
	POLYOLEFIN HEAT SHRINK SLEEVE	2	

**SPO 04-S1 POLYETHYLENE SLEEVING FOR DI PIPE AND FITTINGS**

<b>STANDARD</b>	AS 3680:1989 Polyethylene sleeving for ductile iron pipelines AS 3681:1989 Guidelines for the application of polyethylene sleeving to ductile iron pipe & fittings																																																						
<b>DRAWING</b>	W1-2-17A Mainlaying application of sleeving for corrosion protection of DICL pipes W1-2-17B Mainlaying application of sleeving for corrosion protection of DICL fittings																																																						
<b>DESIGN</b>	Polyethylene sleeving of ductile iron pipelines is intended to prevent surrounding aggressive soils/groundwater contacting the pipeline and causing corrosion. Free flow of ground water within the sleeving is not acceptable and would not be expected occur with properly installed sleeving. The effectiveness of sleeving is not impaired by the presence of condensate or small amounts of water that may be trapped within the sleeve.																																																						
<b>MATERIAL</b>	Non-regenerated linear low density polyethylene (nominal melt flow index of 1.0 max)																																																						
<b>DIMENSIONS</b>	<table border="0"> <thead> <tr> <th rowspan="2">Nominal size</th> <th colspan="2">Layflat tube width (mm)</th> <th rowspan="2">Nominal size</th> <th colspan="2">Layflat tube width (mm)</th> </tr> <tr> <th>Pipes</th> <th>Flanged fittings</th> <th>Pipes</th> <th>Flanged fittings</th> </tr> </thead> <tbody> <tr> <td>80 or 100</td> <td>350</td> <td>425</td> <td>375</td> <td>875</td> <td>875</td> </tr> <tr> <td>150</td> <td>425</td> <td>425</td> <td>450 or 500</td> <td>1100</td> <td>1100</td> </tr> <tr> <td>225 or 250</td> <td>635</td> <td>635</td> <td>600</td> <td>1270</td> <td>1270</td> </tr> <tr> <td>300</td> <td>725</td> <td>725</td> <td>750</td> <td>1500</td> <td>1500</td> </tr> </tbody> </table> <p>Thickness: 200 µm minimum ± 20 µm</p> <table border="0"> <thead> <tr> <th>Nominal size</th> <th>Sleeves per roll</th> <th>Nominal size</th> <th>Sleeves per roll</th> </tr> </thead> <tbody> <tr> <td>80 or 100</td> <td>30</td> <td>375</td> <td>12</td> </tr> <tr> <td>150</td> <td>25</td> <td>450 or 500</td> <td>10</td> </tr> <tr> <td>225 or 250</td> <td>17</td> <td>600</td> <td>8</td> </tr> <tr> <td>300</td> <td>15</td> <td>750</td> <td>7</td> </tr> </tbody> </table>	Nominal size	Layflat tube width (mm)		Nominal size	Layflat tube width (mm)		Pipes	Flanged fittings	Pipes	Flanged fittings	80 or 100	350	425	375	875	875	150	425	425	450 or 500	1100	1100	225 or 250	635	635	600	1270	1270	300	725	725	750	1500	1500	Nominal size	Sleeves per roll	Nominal size	Sleeves per roll	80 or 100	30	375	12	150	25	450 or 500	10	225 or 250	17	600	8	300	15	750	7
Nominal size	Layflat tube width (mm)		Nominal size	Layflat tube width (mm)																																																			
	Pipes	Flanged fittings		Pipes	Flanged fittings																																																		
80 or 100	350	425	375	875	875																																																		
150	425	425	450 or 500	1100	1100																																																		
225 or 250	635	635	600	1270	1270																																																		
300	725	725	750	1500	1500																																																		
Nominal size	Sleeves per roll	Nominal size	Sleeves per roll																																																				
80 or 100	30	375	12																																																				
150	25	450 or 500	10																																																				
225 or 250	17	600	8																																																				
300	15	750	7																																																				
<b>COLOUR</b>	Sewerage - Cream																																																						
<b>MARKING</b>	<table border="0"> <tr> <td>Manufacturer's name</td> <td>Applicable standard</td> </tr> <tr> <td>Date of manufacture (mm/yyyy)</td> <td>Number of sleeves per roll (on packaging)</td> </tr> <tr> <td>Nominal pipe size</td> <td>Batch (not in AS 3680)</td> </tr> </table>	Manufacturer's name	Applicable standard	Date of manufacture (mm/yyyy)	Number of sleeves per roll (on packaging)	Nominal pipe size	Batch (not in AS 3680)																																																
Manufacturer's name	Applicable standard																																																						
Date of manufacture (mm/yyyy)	Number of sleeves per roll (on packaging)																																																						
Nominal pipe size	Batch (not in AS 3680)																																																						
<b>USE LIMITS</b>	Do not use unrolled lengths of sleeving stored unprotected from sunlight for more than 7 days.																																																						

**SPO 04-S2 ADHESIVE TAPE FOR SECURING POLYETHYLENE SLEEVING**

<b>STANDARD</b>	AS 3680:1989 Polyethylene sleeving for ductile iron pipelines AS 2400.12:1985 SAA Packaging code Part 12: Adhesive closing and sealing tapes				
<b>DESIGN</b>	Pressure sensitive adhesive tape for securing polyethylene sleeving is to have: <ul style="list-style-type: none"> <li>• minimum adhesion to steel of 10N for 25mm of width</li> <li>• minimum breaking strength: 130N for 25mm of width</li> </ul>				
<b>MATERIALS</b>	PVC, polypropylene or polyethylene				
<b>DIMENSIONS</b>	<table border="0"> <tr> <td><b>Width:</b></td> <td>48 mm minimum</td> </tr> <tr> <td><b>Thickness:</b></td> <td>As appropriate to achieve minimum breaking strength</td> </tr> </table>	<b>Width:</b>	48 mm minimum	<b>Thickness:</b>	As appropriate to achieve minimum breaking strength
<b>Width:</b>	48 mm minimum				
<b>Thickness:</b>	As appropriate to achieve minimum breaking strength				

**SPO 04-S3 STRAP & BUCKLE FOR SECURING POLYETHYLENE SLEEVING**

<b>STANDARD</b>	AS 3680:1989 Polyethylene sleeving for ductile iron pipelines				
<b>DESIGN</b>	<table border="0"> <tr> <td>The strap is to have: <ul style="list-style-type: none"> <li>• minimum breaking strength of 500N</li> <li>• maximum elongation of 5% at breaking</li> </ul> </td> <td>The strap buckle is to: <ul style="list-style-type: none"> <li>• be of sufficient size and shape to accommodate appropriate strapping</li> <li>• allow tension of strap to be maintained.</li> </ul> </td> </tr> </table>	The strap is to have: <ul style="list-style-type: none"> <li>• minimum breaking strength of 500N</li> <li>• maximum elongation of 5% at breaking</li> </ul>	The strap buckle is to: <ul style="list-style-type: none"> <li>• be of sufficient size and shape to accommodate appropriate strapping</li> <li>• allow tension of strap to be maintained.</li> </ul>		
The strap is to have: <ul style="list-style-type: none"> <li>• minimum breaking strength of 500N</li> <li>• maximum elongation of 5% at breaking</li> </ul>	The strap buckle is to: <ul style="list-style-type: none"> <li>• be of sufficient size and shape to accommodate appropriate strapping</li> <li>• allow tension of strap to be maintained.</li> </ul>				
<b>MATERIALS</b>	Polypropylene or other material with similar chemical properties.				
<b>DIMENSIONS</b>	<table border="0"> <tr> <td><b>Strap Width:</b></td> <td>15 mm minimum</td> </tr> <tr> <td><b>Strap Thickness:</b></td> <td>0.3 mm minimum</td> </tr> </table>	<b>Strap Width:</b>	15 mm minimum	<b>Strap Thickness:</b>	0.3 mm minimum
<b>Strap Width:</b>	15 mm minimum				
<b>Strap Thickness:</b>	0.3 mm minimum				

## SPO 04-S4 PETROLATUM TAPE SYSTEM

<b>STANDARD</b>	AWWA C217	Cold Applied Petrolatum Tape and Petroleum Wax Tape Coatings for the Exterior of Special Sections, Connections and Fittings for Buried Steel Water Pipelines		
	DIN 30672	Coatings of Corrosion Protection Tapes and Heat Shrinkable Material for Pipelines		
<b>DESIGN</b>	The petrolatum system comprises four parts being 1) primer paste, 2) mastic, 3) petrolatum tape and 4) overwrap tape. The primer paste is first applied to surfaces free of water droplets and loose rust, scale, mud, paint etc. The mastic is then used to contour all sharp and irregular profiles to prevent bridging and subsequent perforation or tearing of overlying tape. Petrolatum tape having the heavy compound side down is then spirally wound about components without stretching. Tape is overlapped 55% for consistent full double thickness and tape is smoothed by hand to remove voids, ensure intimate contact and seal the tape overlaps. Finally the overwrap plastic tape is spirally wound without stretching to achieve 55% overlap for consistent double thickness. Overwrap provides mechanical protection against backfill, stray electrical current and leaching.			
<b>MATERIALS</b>	<b>Primer paste:</b>	Petrolatum (saturated petroleum based hydrocarbons), inert fillers and passivating agents		
	<b>Mastic:</b>	Petrolatum (saturated petroleum hydrocarbons), inert fillers, reinforcing synthetic fibres		
	<b>Petrolatum tape:</b>	Non-woven synthetic fabric, fully impregnated and coated with neutral petrolatum based compounds and inert fillers		
	<b>Overwrap tape:</b>	Plasticised PVC coated with a rubber based adhesive		
<b>DIMENSIONS</b>	<b>Petrolatum tape widths:</b>	50, 75, 100, 150, 200 mm		
	<b>Overwrap tape widths:</b>	50, 100, 150 mm		
<b>MASTIC COVERAGE</b>	<b>Nominal size</b>	<b>Flanges pair (kg)</b>	<b>Nominal size</b>	<b>Flanges pair (kg)</b>
	80	2.15	300	8.65
	100	2.85	375	10.6
	150	4.30	450	12.85
	200	5.70	500	14.30
	225	6.50	600	17.25
	250	7.25	750	21.35
	Note: the above quantities are approximate only and depend upon application conditions			
<b>PACKAGING</b>	<b>Primer paste:</b>	Tins, boxes or drums		
	<b>Mastic:</b>	Blocks		
	<b>Primary Tape</b>	Rolls		
	<b>Overwrap Tape</b>	Rolls		
<b>PACKAGING MARKING</b>	Manufacturer's name or trademark			
<b>MARKING METHOD</b>	Legible and durable marking			
<b>USE LIMITS</b>	For bolted joints with bituminous coatings (e.g. flanged joints, gibault joints, dismantling joints using galvanised bolts Do not use where stainless steel bolts are used Do not use to wrap welded joints of steel pipe having polyethylene coating, e.g Sintakote.			

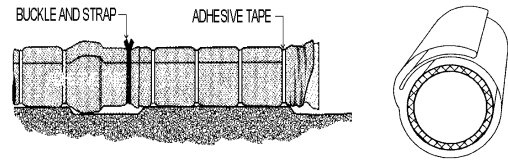
## SPO 04-S5 BITUMEN TAPE SYSTEM

STANDARD	AWWA C217	Cold Applied Petrolatum Tape and Petroleum Wax Tape Coatings for the Exterior of Special Sections, Connections and Fittings for Buried Steel Water Pipelines
	DIN 30672	Coatings of Corrosion Protection Tapes and Heat Shrinkable Material for Pipelines
DESIGN	The bitumen tape system comprises of three parts being 1) primer liquid, 2) mastic strip, 3) tape. The primer paste is first applied to surfaces free of water droplets and loose rust, scale, mud, paint etc. The mastic is then used to contour all sharp and irregular profiles to prevent bridging and subsequent perforation or tearing of overlying tape. Tape having the heavy compound side down is then spirally wound about components without stretching. Tape is overlapped 55% for consistent full double thickness and tape is smoothed by hand to remove voids, ensure intimate contact and seal the tape overlaps.	
MATERIALS	<b>Primer liquid:</b> <b>Mastic strip:</b> <b>Tape:</b>	High softening point bitumen liquid hydrocarbon Permanent plastic mastic Non-woven synthetic fabric, fully impregnated and coated with neutral petrolatum based compounds and inert fillers
DIMENSIONS	<b>Mastic strip widths:</b> <b>Tape widths:</b>	50, 100 mm 50, 100, 150 mm
PACKAGING	<b>Primer paste:</b> <b>Mastic:</b> <b>Tape</b>	Tins or drums Rolls Rolls
PACKAGING MARKING	Manufacturer's name or trademark	
MARKING METHOD	Legible and durable marking	
USE LIMITS	For bolted joints with bituminous coatings (e.g. flanged joints, gibault joints, dismantling joints using galvanised bolts Do not use where stainless steel bolts are used	

**SPO 04-S6 POLYOLEFIN HEAT SHRINK SLEEVES**

<b>STANDARD</b>	<p>AWWA C217 Heat Shrinkable Cross Linked Polyolefin Coatings for the Exterior of Special Sections, Connections and Fittings for Steel Pipelines</p> <p>DIN 30 672 Coatings of Corrosion Protection Tapes and Heat Shrinkable Material for Pipelines</p> <p>The following ASTM material properties/performance test methods are also applicable: D 149, D 257, D 570, D 638, D 792, D1000, D1002, D1044, D2240, D2671, E 28, G 8, G 42.</p>				
<b>DESIGN</b>	<p>Heat shrink sleeves are used for external corrosion protection of steel pipelines. They are used to protect exposed steel at joints after welding and to repair damaged external polyethylene or fusion bonded epoxy coatings on steel pipes or fittings. Heat shrink sleeves consist of two components; a cross linked polyethylene sleeve which when heated shrinks to a predetermined dimension; and a heat sensitive corrosion protective adhesive pre-applied to the polyethylene sleeve, which softens on heating to adhere to the steel.</p>				
<b>INSTALLATION</b>	<ol style="list-style-type: none"> <li>1) Exposed steel is solvent cleaned to remove oil, grease and other contaminants.</li> <li>2) Edges of adjacent Sintakote PE coatings on pipes/fittings bevelled at least 10mm.</li> <li>3) Steel surfaces are dried and abraded using emery paper or steel file to produce clean non-corroded surface</li> <li>4) Adjacent PE pipe/fitting coating is slightly roughened using 120 grit emery or sandpaper over approximately 100mm width (sleeve to overlap Sintakote over 100mm).</li> <li>5) Sleeve application surfaces are wiped clean or air blasted</li> <li>6) Steel surfaces are preheated, then a primer is brush applied</li> <li>7) First 150mm of heat shrink sleeve underlap is gently heated to tack to pipe/fitting and sleeve centred over joint where applicable.</li> <li>8) Remaining sleeve underlap is heated &amp; sleeve wrapped around pipe with appropriate overlap.</li> <li>9) With an appropriate torch, sleeve is heated circumferentially around pipe/fitting using broad strokes. Heating works from centre to sleeve edge until recovery (shrinkage) is complete, then from centre to other edge. Shrinkage is complete when adhesive oozes at sleeve edges all around the circumference.</li> <li>10) Sleeve shrinking is finished with long horizontal strokes over the entire surface to ensure uniform bond.</li> <li>11) While sleeve is still hot the sleeve is gently rolled with a hand roller to push any trapped air out from under the sleeve. If necessary reheat to roll out air.</li> <li>12) Firmly roll the sleeve overlap closure with long horizontal strokes towards sleeve ends.</li> <li>13) Inspect the sleeve for full contact, cracks and holes and for a bead of mastic exuded at both ends for the full pipe circumference</li> <li>14) Repair sleeve as required using heat activated repair patch for areas smaller than 150x150.</li> <li>15) For larger damaged areas, remove and replace damaged sleeve.</li> <li>16) Allow 2 hours for sleeve cooling prior to any backfilling.</li> </ol> <p><b>NOTE:</b> Undertake application of Heat Shrink Sleeves and Sintakote coating repairs in accordance with the Sintakote Steel Pipeline Systems Handling and Installation Manual</p>				
<b>MATERIALS</b>	<table border="0"> <tr> <td style="padding-right: 20px;"><b>Sleeve:</b></td> <td>Irradiated and cross linked oriented impermeable polyethylene</td> </tr> <tr> <td><b>Adhesive coating on sleeve:</b></td> <td>Mastic type heat activated adhesive which forms an elastomeric protective layer to prevent ingress of water.</td> </tr> </table>	<b>Sleeve:</b>	Irradiated and cross linked oriented impermeable polyethylene	<b>Adhesive coating on sleeve:</b>	Mastic type heat activated adhesive which forms an elastomeric protective layer to prevent ingress of water.
<b>Sleeve:</b>	Irradiated and cross linked oriented impermeable polyethylene				
<b>Adhesive coating on sleeve:</b>	Mastic type heat activated adhesive which forms an elastomeric protective layer to prevent ingress of water.				
<b>SLEEVE WIDTH</b>	300, 450, 600, 900 mm				
<b>STORAGE</b>	<p>Store in manufacturer's original packaging and leave unopened until required use</p> <p>Store in dry ventilated area</p> <p>Avoid exposure to direct sunlight, rain, dust or other adverse environments</p> <p>Avoid prolonged storage to temperatures above 35°C</p>				
<b>PACKAGING MARKING</b>	<p>Manufacturer's name or trademark</p> <p>Product name and identification codes</p> <p>Batch or lot number</p> <p>Date of manufacture</p>				

### POLYETHYLENE SLEEVING SYSTEM (for Ductile Iron Pipe and Fittings)



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

### PETROLATUM TAPE SYSTEM



Denso<sup>1,2</sup>



#### NOTES

1. This system comprises Denso Multi-Purpose Primer, Denso Tape with a minimum of 55% overlap and Denso MP/HD Tape with a minimum of 55% overlap. Use Denso Mastic as necessary to contour sharp or irregular profiles.
2. Denso Mastic and Denso Tape have a maximum service temperature of 55C. For higher service temperatures to 75C, use Densyl Supersoft Mastic and Densyl Tape.

### BITUMEN TAPE SYSTEM (WELDED JOINTS ON PE COATED STEEL PIPE)



Denso<sup>1,2,3</sup>



#### NOTES

1. This system comprises Denso Primer D and Denso Ultraflex 1500 tape with a minimum of 55% overlap. Use Densopol Mastic strip as necessary to contour sharp or irregular profiles.
2. For Sintakote repairs, the use of an overwrap tape, Denso MP/HD, is recommended by Tyco in addition to the system described at Note 3 above. The overwrap tape should be installed with a minimum overlap of 10%.
3. For Sintakote repairs, a butyl rubber based primer, Densolen HT Primer can be used with this system in place of Denso Primer D.

**POLYOLEFIN HEAT SHRINK SLEEVE**  
(FOR REPAIRS & WELDED JOINTS ON  
SINTAKOTE STEEL PIPELINES)

**Denso**  
(Canusa Wrapid Sleeve)

**I**

---

**I = Interim Approval**

**NOTES**

1. Average service temperature should be less than 30C. Maximum service temperature 45C.