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## APPROVAL TO DEVIATE FROM THIS STANDARD

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Approval may be granted by the Asset Owner to deviate from the requirements as stipulated in this Standard if the functional requirements (e.g. Asset Life) for the asset differs from those stated in the Standard, but is assessed as still being acceptable by the Asset Owner's nominated representative.

Any approval to deviate from the stated requirements of this Standard will not be seen as creating a precedent for future like project. Any request to deviate from this Standard must be carried out on a project by project basis where each alternate proposal will be individually assessed on its own merit.

## NO CHANGES REQUIRED IN THE JANUARY 2007 EDITION

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The following lists the major changes to the January 2003 edition and published in the November 2004 edition of TS 81:

1. February 2004-Complete review of document resulted in a number of minor changes. No significant change was made to the overall content.
2. Conversion to a technical standard by removal of contractual conditions (to be included in the contract that references this standard).

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## REFERENCED DOCUMENTS

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AS 1627: Metal finishing - Preparation and pretreatment of surfaces

**AS 3894:** Site testing of protective coatings

**TS 29** The Protection of Ductile Iron and Cast Iron Pipework and Fittings in Below Ground Pipelines Using Denso Petrolatum Tape Wrapping System

## SECTION 1: SCOPE

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This Technical Standard (TS) details the surface preparation and application of bitumen mastic based anti-corrosion tapes and compounds for all below ground steel pipelines, including the following:

- Repair of fusion bonded polyethylene (Sintakote)
- Welded joints and bends in steel (Sintakote) pipelines
- Steel fittings for all pipelines.
- All uncoated steel pipes

The system shall consist of the following approved products:

- |                |   |                            |             |
|----------------|---|----------------------------|-------------|
| • Primer       | - | Densopol Primer D          | (Denso 360) |
| • Mastic       | - | Denso Bitumen Mastic Strip | (Denso 461) |
| • Tape         | - | Densopol 60 Tape           | (Denso 760) |
| • PVC Overwrap | - | Denso MP/HD Tape           | (Denso 931) |

This standard shall be read in conjunction with the manufacturers technical bulletins.

## SECTION 2: QUALIFICATION

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Applicators shall have completed appropriate competency based training (ie Denso training course) approved by SA Water prior to the application of the authorised products.

### 2.1 SA Water's Representative

SA Water's Representative in this Technical Standard will be nominated by SA Water.

## SECTION 3: REPAIR OF DAMAGED SINTAKOTE

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### 3.1 General

Damaged Sintakote shall be repaired in accordance with the procedures detailed in the Tyco Handling and Installation Manual for steel pipeline systems for the repair of Sintakote or in accordance with Clause 3.2 or Clause 3.3.

### 3.2 Repair of Small Pinhole Type Defects

#### 3.2.1 Surface Preparation

Clean and dry the area to be repaired including the removal of dirt, dust and other contaminants. Slightly roughen the area around the repair for a minimum

distance of 50 millimetres using a coarse file or abrasive paper. Wipe the surface clean with a clean dry rag.

### 3.2.2 Priming

Stir the primer to ensure complete mixing prior to application. Apply a thin even coat of Densopol Primer D around the area of repair using a paintbrush or roller.

Allow the primer to tack dry (approximately 10 to 20 minutes).

### 3.2.3 Tape Wrapping

Apply Densopol 60 tape to the repair area ensuring a minimum of 50 mm overlap onto sound coating around the defect area.

Apply Denso MP/HD P.V.C. self-adhesive over-wrap tape around the full pipe circumference to completely cover the repaired patch.

## **3.3 Repair of Large Area of Damage Where Steel Is Exposed**

### 3.3.1 Surface Preparation

Cut out the damaged area of Sintakote and clean the steel surface in accordance with AS1627.2 to Class St 2. Clean and dry the area to be repaired. Slightly roughen the area around the repair using a coarse file or abrasive paper. Wipe the surface clean with a clean dry rag.

### 3.3.2 Priming

Stir the primer to ensure complete mixing prior to application. Apply a thin, even coat of Densopol Primer D onto the steel surface and around the periphery of the Sintakote.

Allow the primer to tack dry (approximately 10 to 20 minutes).

### 3.3.3 Filling/Priming

Cut out a piece of Bitumen Mastic Strip to fit into the bare steel area prior to applying the primer. Insert the cut out piece of Bitumen Mastic Strip into the repair area.

Re-apply a thin even coat of Densopol Primer D over the patch and adjacent area of Sintakote.

Allow the primer to tack dry (approximately 10 to 20 minutes).

### 3.3.4 Tape Wrapping

Apply Densopol 60 tape to the repair area ensuring a 50 mm overlap over the fitted patch.

Apply Denso MP/HD P.V.C. self adhesive over-wrap tape around the full pipe circumference to completely cover the repaired patch.

## **SECTION 4: WELDED JOINTS, BENDS AND PIPES**

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### **4.1 Surface Preparation**

All joints shall be fully welded and sealed and all sharp edges and corners ground off to a radius of not less than 1.5 mm. All weld spatter and irregularities shall be removed. Any unsound or damaged edges of Sintakote shall be cut back into sound coating and the edges chamfered.

The surface shall be cleaned by means of power tools to achieve a minimum surface preparation in accordance with AS1627.2 to Class St 2. All dust, dirt, moisture and grease shall be removed. Slightly roughen the Sintakote 100 millimetres both sides of the joint, using a coarse file or abrasive paper. Wipe the surface clean with a clean dry rag.

### **4.2 Priming**

Stir the primer to ensure complete mixing prior to application. Apply a thin even coat of Densopol Primer D to the steel and roughened Sintakote surfaces using a paintbrush or roller.

Allow the primer to touch dry (approximately 10 to 20 minutes).

### **4.3 Mastic Filling**

To improve the contours for wrapping the tape, fillet welds, sharp edges of Sintakote, test plugs or welding lead holes shall be filled and profiled with Bitumen Mastic Strip. The mastic filling shall be moulded such that the Densopol 60 tape can be applied with no sharp edges protruding or air entrapment.

### **4.4 Tape Wrapping**

Commencing at least 100 millimetres back onto the primed Sintakote one complete turn of 150 millimetre wide Densopol 60 tape shall be applied. Release film must be removed before application. While holding the tape under tension, the pipe shall be spirally wrapped using a 55 percent overlap and finished 100 mm onto the primed Sintakote with one complete circumferential wrap around the pipe. The tape shall be cut off in the downward direction of wrapping. New rolls of tape shall have the ends overlapped at least 75 millimetres.

During wrapping the tape shall be smoothed out by hand to exclude any air bubbles or wrinkles and to seal the overlaps.

Care shall be taken to prevent any folds or misplacement of the tape, especially under the pipe, and to prevent the tape becoming contaminated during wrapping.

The butt-welds in segmental (lobster back) bends are to have the tape applied partial layer by partial layer with a 55% overlap until a full spiral wrap can be made. (Refer Sketch in Appendix A) Continue wrapping onto the primed

Sintakote for at least 100 millimetres with one complete circumferential wrap around the pipe.

Straight steel pipes shall also be wrapped with Densopol 60 with a 55% overlap in accordance with the above clauses.

## **SECTION 5: STEEL FITTINGS AND FLANGES**

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### **5.1 General**

Procedures for the protection of steel fittings applies to both main pipeline fittings and branch pipework. Fittings manufactured and coated by Tyco shall be factory coated with Sintakote. Difficult fittings such as valves may be protected using a more conformable petrolatum system in accordance with TS 29 only with the approval of SA Water's Representative.

### **5.2 Surface Preparation**

Steel surfaces shall be prepared in accordance with Clause 4.1.

### **5.3 Tape Wrapping**

Prepare and wrap all straight sections leading up to the fitting and flange in accordance with Section 4.

### **5.4 Priming**

Stir the primer to ensure complete mixing prior to application. Apply a thin even coat of Densopol Primer D to the prepared steel surfaces and a minimum of 50 millimetres onto the Densopol 60 wrapped areas using a paintbrush.

Allow the primer to touch dry (approximately 10 to 20 minutes).

### **5.5 Mastic Wrapping**

Unavoidable sharp edges such as bolts, nuts and collars shall have mastic strip moulded over the protrusions or edges. Wrap the fitting or flange with a layer of Bitumen Mastic Strip with a 55% overlap onto itself and minimum 50 millimetre overlap onto the Densopol 60 or Sintakote coated pipework. Press the Bitumen Mastic Strip firmly into place ensuring no air voids are beneath the Bitumen Mastic Strip.

Note: The Bitumen Mastic Strip provides corrosion protection to the steelwork and is similar in composition to Densopol 60, but it does not have a woven carrier.

## 5.6 Over Wrapping

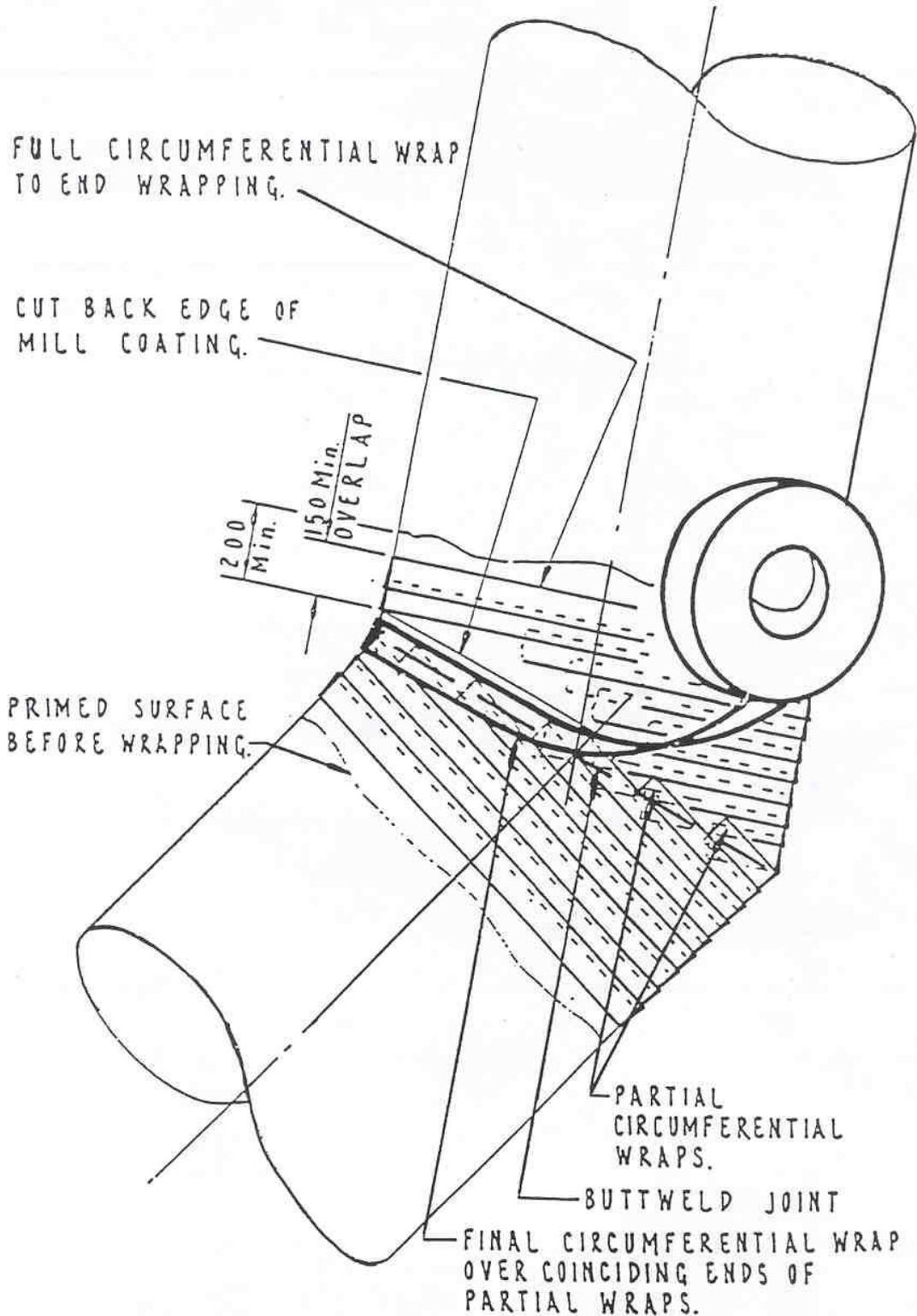
150 or 100 millimetre wide Denso MP/HD tape (self adhesive PVC) shall be spirally wrapped over the Bitumen Mastic Strip with a 55% overlap. While wrapping, the Denso MP/HD tape shall be pulled firmly and the laps properly sealed.

## SECTION 6: TESTING

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All repairs and wrapping shall be tested using a high voltage "spark" tester in accordance with AS3894.1 at an operating voltage of 15 KV.

# APPENDIX A: WRAPPING PROCEDURE FOR SEGMENTAL BEND



## WRAPPING PROCEDURE FOR SEGMENTAL BEND