



CUPS REMEDIATION SOLUTION WITHOUT PIPE LIFT-OFF

CAPABILITIES STATEMENT

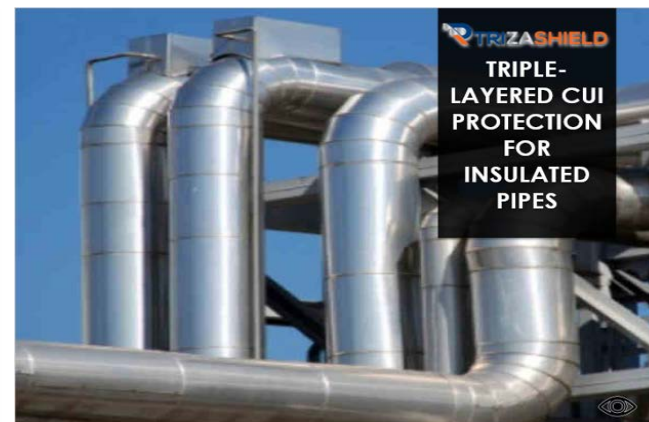
In collaboration with **TRENTON**
Wax-Tape® Systems





Combining Disruptive Technologies and Proven Engineering Capabilities

CORROSION CONTROL SOLUTIONS



CUPS – THE HIDDEN CHALLENGE

- ① CUPS presents a real threat to piping integrity and the most common cause of external piping failure in ageing assets due to:
 - Highly localised deterioration
 - Difficult to inspect
 - Major impact to pressure containment and loss of production
 - Potential explosion and adverse business impact
 - Challenging to repair online
 - Significant repair cost

- ② Root Cause of CUPS:
 - Design of pipe support allows crevices to be formed
 - Displacement and vibration of pipes
 - Protective coating damage
 - Crevice corrosion
 - Wear (metal to metal contact)
 - Galvanic corrosion





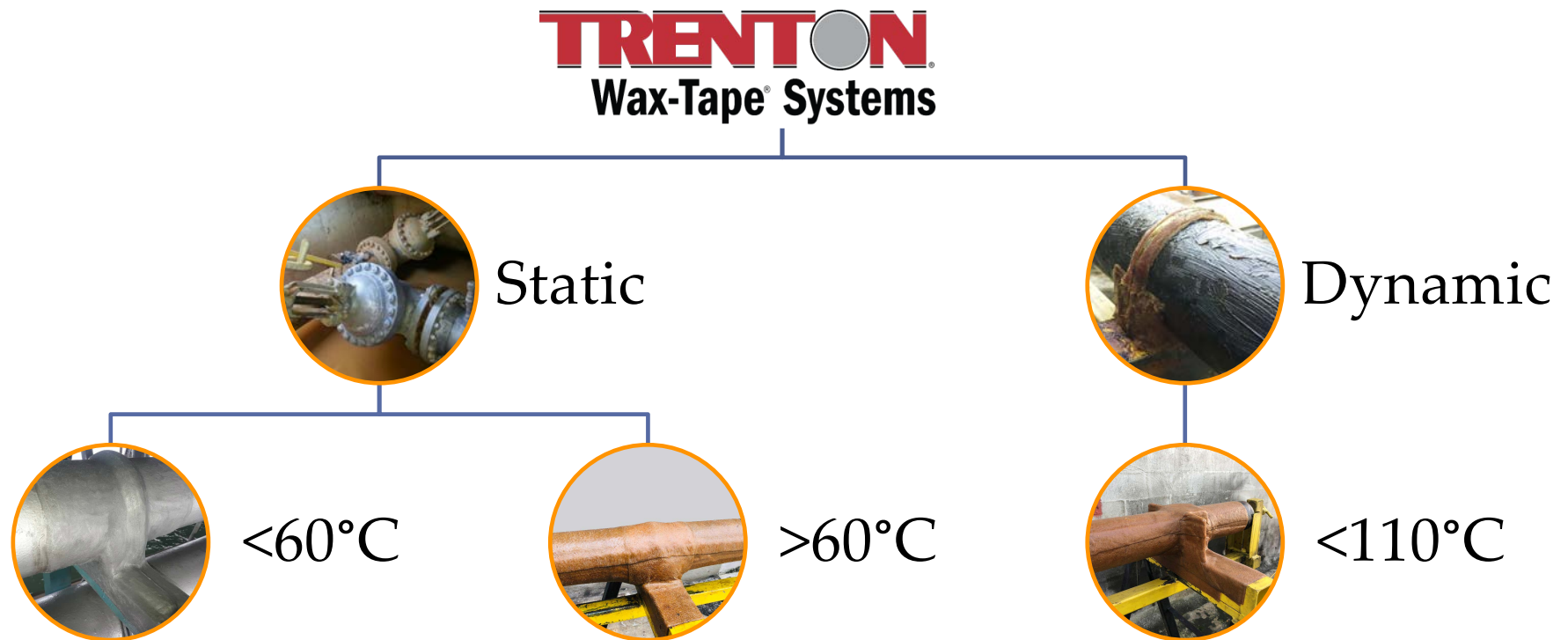
MICROCRYSTALLINE WAX-TAPE

TRENTON WAX-TAPE SYSTEMS



1. Inert and **not biodegradable**
2. Conformability to **irregular fittings**
3. Compatibility with many **types of materials**
4. **Minimal** surface preparation
5. **Easy to apply** – Easy to cut and mold into desired shape
6. Can be applied over **wet surfaces**
7. **Hydrophobic** - Acts as a barrier that prevents contact with air, water, and micro-organisms.
8. **No drying or curing time**
9. **Expands and contracts** based on the operating environment.
10. Resistance to **weathering and UV (sunlight)**.
11. Will **not dry or crack**.
12. **Environment Friendly** - Non-toxic, non-carcinogenic, low Volatile Organic Components (VOCs)
13. Can be **painted** after tape firms up. (Acrylic Latex, or other water-based paints, etc.)

TRENTON WAX TAPE SYSTEM FOR PIPE SUPPORTS





TRENTON WAX-TAPE SYSTEM

STATIC PIPE SUPPORT



TRENTON WAX-TAPE SYSTEM FOR STATIC PIPE SUPPORT: < 60° C



SOLUTION FOR PIPE SUPPORT WITHOUT PIPE LIFT-OFF:

- 1) TEMCOAT 3000 PRIMER
- 2) FILL PRO AS FILLER
- 3) WAX-TAPE # 2 AS TAPE WRAP



- **MAXIMUM DISPLACEMENT LIMIT: 4MM**

TRENTON WAX-TAPE SYSTEM FOR STATIC PIPE SUPPORT: > 60° C



SOLUTION FOR PIPE SUPPORT WITHOUT PIPE LIFT-OFF:

- 1) TEMCOAT 3000 PRIMER
- 2) HT-3000 AS FILLER
- 3) HT-3000 AS TAPE WRAP

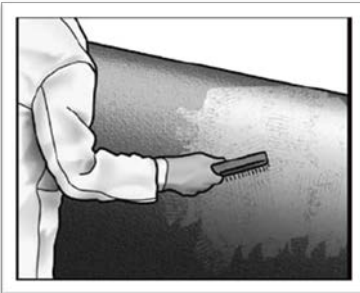
- **DISPLACEMENT LIMIT > 40 MM**
- **MAXIMUM OPERATING TEMPERATURE LIMIT:
110° C**



APPLICATION PROCEDURE: STATIC PIPE SUPPORT



Step 1 – Surface Preparation



- Hand wire brush (SSPC SP2 or ISO St2)
- Wipe surface so that its free from loose scale, dirt and old loose coatings.

Step 3 – Apply Wax-Tape



- With downward-facing starting point, apply the wax-tape #2 firmly with 50% overlap.
- Press the tape firmly to remove air bubbles.

Step 2 – Apply Primer



- Apply Temcoat 3000 thoroughly and firmly press primer to displace moisture.
- Fill in gaps and voids between pipe and support with Wax-Tape #1 or for pipes operating between

Step 4 – Inspection

- Ensure adequate overlap
- Ensure no trapped pockets of air or water
- Ensure all edges are firmly pressed down, sealed and tapered especially on each end of the wrap application.
- Wax-Tape #2 does not required curing so it can be backfilled immediately
- *If ambient site temperature is below 50 F/10 °C, warm up the wrap before application.*



TRENTON WAX-TAPE SYSTEM

DYNAMIC PIPE SUPPORT



TRENTON WAX-TAPE SYSTEM FOR DYNAMIC PIPE SUPPORT



SOLUTION FOR PIPE SUPPORT WITHOUT PIPE LIFT-OFF:

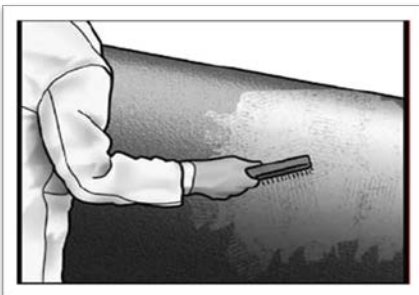
- 1) TEMCOAT 3000 PRIMER
- 2) HT-3000 AS FILLER
- 3) HT-3000 AS TAPE WRAP

- **DISPLACEMENT LIMIT > 40 MM**
- **MAX OPERATING TEMPERATURE LIMIT: 110° C**



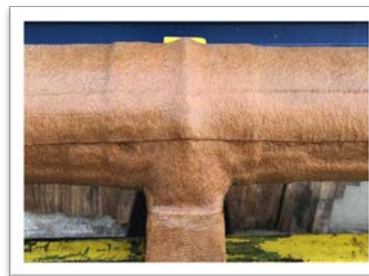
APPLICATION PROCEDURE: DYNAMIC PIPE SUPPORT

Step 1 – Surface Preparation



- Hand wire brush (SSPC SP2 or ISO St2)
- Wipe surface so that its free from loose scale, dirt and old loose coatings.

Step 3 – Apply Wax-Tape



- With downward-facing starting point, apply the wax-tape HT-3000 firmly with minimum of 50% overlap.
- Press the tape firmly to remove air bubbles.

Step 2 – Apply Primer & Filler



- Apply Temcoat 3000 thoroughly and firmly press primer to displace moisture.
- Fill in gaps and voids with Wax-Tape #1 or on pipes operating 60-110°C, use cut up pieces of HT-3000 instead

Step 4 – Inspection

- Ensure adequate overlap
- Ensure no trapped pockets of air or water
- Ensure all edges are firmly pressed down, sealed and tapered especially on each end of the wrap application.
- *If ambient site temperature is below 50oF/10oC, warm up the wrap before application.*

SGS REPORTS: STATIC AND DYNAMIC PIPE SUPPORTS

TRENTON
Wax-Tape Systems



SGS to inspect and witness:

Objective: To test and quantify displacement limit of Wax-Tape systems in application to Corrosion Under Pipe Support for both Static and to Dynamic pipes.

Results:

- 1) Wax-tape system for static pipe support can tolerate up to 4mm in pipe displacement.
- 2) Wax-Tape system for dynamic pipe support can withstand more than 40mm in longitudinal displacement without showing any damage or disbondment
- 3) Vibration has no effect on conditions of Wax-Tapes.



SGS REPORTS: STATIC AND DYNAMIC PIPE SUPPORTS



SGS (Malaysia) Sdn Bhd (Company No. 10671-T)
No. 26, Jalan Anggerik Vanilla 3/195,
40000 Sunway Iskandar, Selangor,
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Fax: +603-5122 1818

Certificate No.: F580101KLN/9645 (1047106) Date: 20th May 2020
Page 13

INSPECTION CERTIFICATE

In pursuance of an order for inspection given to us:

By Messrs. IEV GROUP Sdn Bhd,
Test of Wax-Tape System for Displacement Limit in Presence Against
Corrosion Under Pipe Supports (CUPs) for Static Pipe
Tension Pipe
At IEV Malaysia, No. 13, Jalan Tandang, 40000, Petaling Jaya,
Selangor
On 12th May 2020.

We report with certainty as follows:

Our Surveyor attended at IEV Group Sdn Bhd, on 12th May 2020 for witnessing the described as below:

Description Requested:

TRENTON WAX-TAPE SYSTEM FOR DYNAMIC PIPE SUPPORT

- Primer Tensolac™
- FIB-PRO™ PA-GP Profiling Mastic used as filler
- Wax-Tape™ AT used as wrap tape

The undersigned hereby certifies that the above is a true and correct statement of the facts as presented to him/her by the client and that the same are in conformity with the requirements of the contract of inspection.

Prepared By: MOHD ALHAMDI SABAH
Inspection Engineer

Reviewed & Approved By: SYAMSUL ANWAR AHMAD
Department Manager

SGSPAPER 19007663

Wax-tape Wrapping on
Static Pipe Support
Max displacement Limit – 4mm

SGS (Malaysia) Sdn Bhd (Company No. 10671-T)
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Inspection Engineer

Reviewed & Approved By: SYAMSUL ANWAR AHMAD
Department Manager

SGSPAPER 19007663

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Corrosion Under Pipe Supports (CUPs) for Dynamic Pipe
Tension Pipe
At IEV Malaysia, No. 13, Jalan Tandang, 40000, Petaling Jaya,
Selangor
On 2nd March 2019.

We report with certainty as follows:

Our Surveyor attended at IEV Group Sdn Bhd, on 2nd March 2019 for witnessing the described as below:

Description Requested:

TRENTON WAX-TAPE SYSTEM FOR DYNAMIC PIPE SUPPORT

- Primer Tensolac™
- HT-3000 used as filler
- HT-3000 used as tape

The undersigned hereby certifies that the above is a true and correct statement of the facts as presented to him/her by the client and that the same are in conformity with the requirements of the contract of inspection.

Prepared By: MOHD ALHAMDI SABAH
Inspection Engineer

Reviewed & Approved By: SYAMSUL ANWAR AHMAD
Department Manager

SGSPAPER 19007701

Wax-tape Wrapping on
Dynamic Pipe Support
Displacement Limit > 40mm

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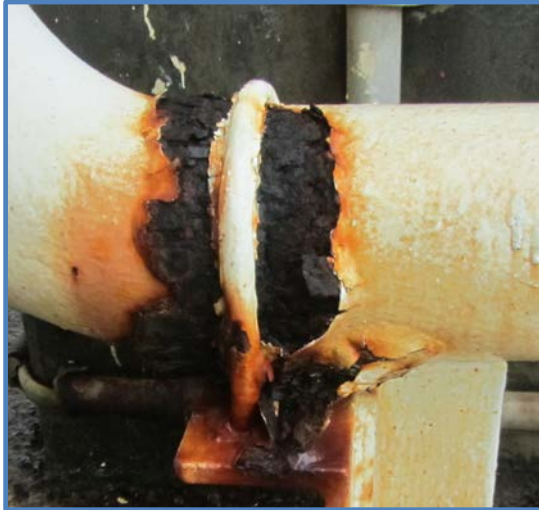
Prepared By: MOHD ALHAMDI SABAH
Inspection Engineer

Reviewed & Approved By: SYAMSUL ANWAR AHMAD
Department Manager

SGSPAPER 19007703

CASE STUDY: PICTURES

TRENTON
Wax-Tape Systems





UNIQUE CHARACTERISTICS OF TRENTON WAX-TAPE AS A CUPS REMEDIATION SOLUTION WITHOUT PIPE LIFT-OFF

- ✓ Can accommodate **both static** and **dynamic pipe supports**
- ✓ Flexible and easy to conform on **irregular shapes** and remove **crevices** at pipe supports
- ✓ **Long-term** CUPS remediation solution
- ✓ Ease of application: **Surface tolerant**, no specialised equipment
- ✓ **Resistance** to UV exposure, chemicals, salts and weathering
- ✓ Applicable on **wet** and **dry** surfaces
- ✓ High operating temperature limit: **110° C**
- ✓ **Can be opened for inspection and re-application**

“COMBINING DISRUPTIVE TECHNOLOGIES AND PROVEN ENGINEERING CAPABILITIES”



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MALAYSIA

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