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4WT NO: 3459
JOB NO: 2748
CLIENT REF: MartyMcAleenan 04/08/16
REPORT NO: 2000

# REPORT

## ON THE TESTING

## OF

## WT-1 LIQUID MEMBRANE

## TO ETA 10/0121

Supplied by:

C-Tec N.I Ltd
Unit 6
Ashtree Enterprise Park
Newry
County Down
BT34 1BY

Report Prepared by:

Lesley J Komatsu

# Report on the testing of

# WT-1 Liquid Membrane

4ward Testing Ltd were contacted by C-Tec N.I. Ltd of Unit 6, Ashtree Enterprise Park, Newry, County Down, Northern Ireland, BT34 1BY and asked to a series of tests on WT-1 Liquid Membrane in line with ETA 10/0121

## Identification

| | |
|---|---|
| Material: | Liquid Membrane |
| Customer Identification: | WT-1 |
| Batch No: | Grey Lot 6981706, Production date 18-01-2016 & Lot 6751184 Production date 27-06-2016 |
| Customer Reference: | e mail Marty McAleenan 04/08/2016 |
| 4ward Sample No: | 3459 |
| Job No: | 2748 |
| Date Received: | 05/08/2016 |

## Test Data

The Sealant was tested as received from the customer with preparation of the test samples being carried out by the Laboratory

All testing is carried out on WT-1 samples that have been allowed to cure for 7 days at 23±2°C, 50±5% RH before any testing or environmental exposure is carried out.

### Water Tightness to EOTA TR-003

The Water Tightness of the Liquid Membrane is determined by applying a specified water pressure to the exposed side of the installed product (free film) by means of a hydrostatic head of water for a fixed period of time and detecting any water leakage.

| | |
|---|---|
| No of samples: | 3 |
| Size of samples: | 200±2mm diameter |
| Conditioning: | > 16hrs at 23±2°C, 50±5% RH |
| Temperature of test: | 23±2°C |
| Water pressure: | 1000mm±5mm hydrostatic head |
| Duration of test: | 24hrs |

Any leakage is determined by change of colour of the moisture indicator present.

Resistance to Water Vapour to EN 1931

To determine the water vapour transmission properties of the Liquid Membrane for calculation of moisture flow rate (g) and moisture resistance factor (μ)

Sample thickness: 2.27mm
No of samples: 3
Dessicant: Calcium Chloride
Test conditions: 23±2°C, 75±5% RH
Duration of test: 28 days

Resistance to Heat Ageing to EOTA TR-11

The following test was carried out after exposure to 80±3°C for 200 days:

- Dynamic Indentation to TR-006

The resistance to dynamic indentation of the Liquid Membrane on a given substrate is determined by applying an Impact Energy by means of given steel indentor on the surface of the Membrane

Perforation of the Membrane is measured by determination of water tightness.

No of samples: 3
Size of samples: 200 x 200 x 3mm
Substrate: Steel & MDF
Temperature of test: -20±2°C
Size of Indentor: 10mm diameter
Impact Energy applied: 5.9 Joules

Pass Criteria: No water penetration or by Spark test

Resistance to UV-Radiation to EOTA TR-11

Exposure conditions for Moderate Climate (Category M)

| | |
|---|---|
| Artificial weathering: | Automatic cycling |
| Test machine type: | Q-Sun Xenon Tester XE-03-HS |
| Exposure to: | ISO 4892-2, Method A |
| Exposure time: | 1000hrs |
| Cycle time: | Dry period: 102mins<br>Black Panel Temperature: 65°C, Air Temperature: 38°C,<br>Humidity: 50% RH<br>Wet period: 18mins<br>Light Off |

The following tests are carried out after the above exposure:

- Dynamic Indentation to TR-006

The resistance to dynamic indentation of the Liquid Membrane on a given substrate is determined by applying an Impact Energy by means of given steel indentor on the surface of the Membrane

Perforation of the Membrane is measured by determination of water tightness.

| | |
|---|---|
| No of samples: | 3 |
| Size of samples: | 200 x 200 x 3mm |
| Substrate: | Steel & MDF |
| Temperature of test: | -10±2°C |
| Size of Indentor: | 10mm diameter |
| Impact Energy applied: | 5.9 Joules |
| Pass Criteria: | No water penetration |

- Tensile and Elongation to ISO 527-3

To determine the change in Tensile strength and Elongation of the Liquid Membrane before and after exposure to UV Radiation.

No of samples; 5
Sample size: Specimen type 5
Conditioning: 23±2°C, 50±5% RH for 24hrs
Test machine: Instron 1114 UKAS Calibration Certificate No:E118062316140634
Speed of test: 500mm/min

Resistance to hot water ageing to EOTA TR-012

The resistance of the Liquid Membrane to hot water is determined by exposing the upper weathering surface of the test specimen to water at a defined temperature during a specified period of time.

No of samples: 1
Size of sample: 300mm x 300m
Depth of water above Membrane: 100mm
Duration: 80 days

Resistance to hot water is determined by the leakage of any water from the test rig.
A visual examination is carried out at the end of the test duration and compared with unexposed material.

Date of testing: 12/8/2016 - 7/3/2017

## Results

### Water Tightness

There was no evidence of any water leakage in any of the 3 samples tested.

### Resistance to Water Vapour

Moisture Vapour Transmission Rate: 12.38g/m²/24hrs

Vapour Resistance: 16.52MNs/g

g: 1.485E-07

μ: 1224

SD;$H_2O$: 2.8

### Resistance to Heat Ageing

- Dynamic Indentation

Samples were soft and sticky but testing could be carried out.

A visual examination carried out after the test showed no sign of any perforation of the Membrane on the steel or MDF bases.

A water tightness test was carried out as above and there were no signs of any perforation of the Membrane.

According to ETAG 005, the above Heat exposed results would suggest the WT-1 to be Category W3 ( expected Working Life 25yrs) and a User Load category of P3 (Normal)

Resistance to UV Radiation

- Dynamic Indentation

A visual examination carried out after the test showed no sign of any perforation of the Membrane on the steel or MDF bases.

A water tightness test was carried out as above and there were no signs of any perforation of the Membrane.

- Tensile Strength & Elongation

| | Controls | | After 1000hrs UV Exposure | |
|---|---|---|---|---|
| Sample | Tensile strength (N/mm²) | Elongation (%) | Tensile strength (N/mm²) | Elongation (%) |
| 1 | 1.69 | 200 | 0.86 | 230 |
| 2 | 1.43 | 170 | 1.25 | 250 |
| 3 | 1.66 | 210 | 0.77 | 170 |
| 4 | 1.72 | 200 | 0.81 | 210 |
| 5 | 1.62 | 250 | 1.32 | 270 |
| Mean | 1.62 | 210 | 1.00 | 230 |
| Std Dev | 0.11 | 30 | 0.26 | 40 |

According to ETAG 005, the above UV exposure results would suggest the WT-1 to be Category W3 ( expected Working Life 25yrs) and a User Load category of P3 (Normal)

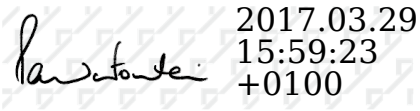
Resistance to Hot Water Ageing

At 80 days exposure there were no signs of any leakage.

According to ETAG 005, the above hot water ageing result would suggest the WT-1 to be Category W3 (expected Working Life 25yrs)

These results relate only to the material tested

Work carried out and recorded by the following personnel:



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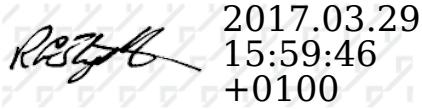
Paula Fountain
Laboratory Technician



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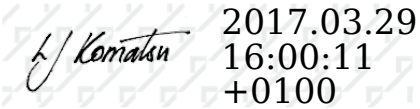
Richard Wright
Laboratory Technician

Work approved by the following personnel:



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L J Komatsu ACQI
*Technical Manager*



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