

4WT NO: 3459  
JOB NO: 2720  
CLIENT REF: MartyMcAleenan 31/03/2016  
REPORT NO: 1934

**4ward Testing Ltd**  
5 Hampers Common  
Industrial Estate  
Petworth  
West Sussex  
GU28 9NR  
United Kingdom

Tel.: +44 (0)1798 342240  
+44 (0)1798 344323  
Fax: +44 (0)1798 344482

info@4wardtesting.co.uk

[www.4wardtesting.co.uk](http://www.4wardtesting.co.uk)

**REPORT**  
**ON THE TESTING**  
**OF**  
**WT-1 LIQUID MEMBRANE**  
**TO ETAG 005**

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 parts of ETAG 005

### Identification

Material: Liquid Membrane  
Customer Identification: WT-1  
Batch No: Grey Lot 6981706, Production date 18-01-2016  
Customer Reference: e mail Marty McAleenan 14/01/2016  
4ward Sample No: 3459  
Job No: 2720  
Date Received: 10/05/2016

### Test Data

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

The following tests were carried out to ETAG 005:

- Part 5.2.1. Reaction to Fire to BS EN ISO 11925-2, Ignitability of Building products subject to direct impingement of flame & and Classification to BS EN ISO 13501-5
- Part 5.3.3.1 Resistance to Delamination (Wind Loads) according to TR-004
- Part 5.3.3.2.1 Resistance to Dynamic indentation according to TR-006
- Part 5.5.5.2.2 Resistance to Static Indentation according to TR-007
- Part 5.3.3.3 Resistance to Fatigue Movement according to TR-008
- Part 5.3.3.4.1. Resistance to Low Temperatures (Crack-Bridging capability) according to TR-013

### Reaction to Fire

To determine the performance of the Liquid Membrane when subject to a single flame source.

Sealant substrate: Calcium silicate.  
Test Flame application position: Surface and edge of sealant  
No of samples tested: 6 from each position  
Time flame applied: 15 seconds

This test is out sourced to a UKAS accredited Laboratory specialising in this testing.

### Resistance to Delamination (Wind Loads) according to TR-004

The Liquid Membrane is bonded to a substrate and the resistance to delamination determined by pulling the sample on a test machine and the maximum force measured.

No of samples: 5  
Size of samples: 100±mm diameter  
Substrate: Steel  
Cure time: 7 days @ 23±2°C, 50±5% RH  
Test machine: Instron 1114, UKAS Calibration Certificate: E105060515100828  
Speed of test: 10mm/min

Pass criteria: > 50kPa (0.05N/mm<sup>2</sup>)

This value has derived from the maximum load by the wind.

### Resistance to Dynamic indentation according 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 indenter on the surface of the Membrane

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

No of samples: 3 & 3  
Size of samples: 200 x 200 x 3mm  
Substrate: Steel & MDF  
Cure time: 7 days @ 23±2°C, 50±5% RH  
Size of Indenter: 10mm diameter  
Impact Energy applied: 5.9 Joules

Pass Criteria: No water penetration or by Spark test

### Resistance to Static Indentation according to TR-007

The resistance to static indentation of the Liquid Membrane on a given substrate is determined by applying a static load for 24hrs onto the surface of the Membrane.

The depth of penetration is measured and if > 80% of original Membrane thickness is considered to be a fail at that Level

No of samples:	6
Size of samples:	200 x 200x 6mm
Substrates:	3 x MDF, 3 x steel
Cure time:	7 days at 23±2°C, 50±5% RH
Indentor:	10mm diameter steel rod with hemispherical head, > 100mm long
Applied Load:	70,150, 200 & 250±1N
Duration of each load:	24hrs

Perforation of the Membrane is measured by determination of water ingress on the MDF substrate and by electrical spark tester on the metal substrate.

### Resistance to Fatigue Movement according to TR-008

The resistance to fatigue movement of the Liquid Membrane is determined by applying the material on a specified substrate with a specified gap and opening and closing this gap and investigating its performance.

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

No of samples:	3
Substrate:	MDF/Concrete slabs to BS EN 1323:2007
Membrane sample:	50 x 150mm
Gap size:	1mm
Cure time:	7 days at 23±2°C, 50±5% RH
Conditioning time:	> 16hrs @ -10°C
Temperature of test:	-10°C
Test machine:	Instron 4204 UKAS Calibration: E105060515100828
Speed of test:	16±0.1mm/hour
Fatigue procedure:	Increase gap from 1mm to 2mm at given speed and subsequently cycle between 2.00 and 0.00mm.
No of cycles:	3

Following cycling the samples are allowed to reach 23±2°C, 50±5% RH before a visual examination is carried out followed by the water tightness test.

### Resistance to Low Temperatures (Crack-Bridging capability) according to TR-013

Verification is performed by inducing a defined crack in the concrete substrate as part of the test specimen and determine the resistance to cracking of the installed product fully bonded, at low temperature during a defined period of time.

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

No of samples: 6  
Substrate: Concrete slabs to BS EN 1323:2007  
Preparation: Blocks are maintained at  $23\pm 2^{\circ}\text{C}$ ,  $90\pm 5\%$  until moisture equilibrium is reached (determined by weight loss)  
Sample size:  $50\pm 1 \times 290\pm 2\text{mm}$   
Gap size: 2mm  
Cure time: 7 days at  $23\pm 2^{\circ}\text{C}$ ,  $50\pm 5\%$  RH  
At this stage 3 of the samples are placed at  $70\pm 2^{\circ}$  for 91 days following which they are removed, allowed to reach ambient and then tested as follows.  
Conditioning: > 12 hrs @  $-30^{\circ}\text{C}$   
Temperature of test:  $-30^{\circ}\text{C}$   
Test machine: Instron 4204 UKAS Calibration: E105060515100828  
Speed of test: 0.5mm/min  
Procedure: Extend the gap by 1.5 mm and hold for 5minutes, remove from test machine and allow to reach  $23\pm 2^{\circ}\text{C}$ ,  $50\pm 5\%$  RH. A visual examination is carried out plus water tightness test

### Water Tightness test

A pipe is sealed over the tested area of sufficient height to give a 100mm head of water. This is left in position for 24hrs and the level of water observed. If there is no drop in the water level there has been no water penetration as a result of the test regime and the Liquid membrane has passed the test.

### Spark test (metal substrates)

A Holitech DC Holiday Detector is used to determine any penetration of the Liquid Membrane. This is observed by a spark being generated when an electrical current is passed over the test area with a wand. If there is no spark then there has been no penetration and the Liquid membrane has passed the test.

## Results

### Reaction to Fire

#### Test Flame Application Position - Surface of Coated Face

Sample No	Ignition Yes/No	Time from start of test for flame tip to reach 150mm (seconds)	Extent of Flame Spread ( $\pm 0.9$ mm)	Flaming debris	Glowing	Extent of Damaged Area (mm)	
						Height	Width
1	No	Did not reach	Nil	None	None	30	13
2	No	Did not reach	Nil	None	None	40	14
3	No	Did not reach	Nil	None	None	35	13
4	No	Did not reach	Nil	None	None	35	12
5	No	Did not reach	Nil	None	None	35	15
6	No	Did not reach	Nil	None	None	40	14

#### Test Flame Application Position - Edge of Coated Face

Sample No	Ignition Yes/No	Time from start of test for flame tip to reach 150mm (seconds)	Extent of Flame Spread ( $\pm 0.9$ mm)	Flaming debris	Glowing	Extent of Damaged Area (mm)	
						Height	Width
1	Yes	Did not reach	10	None	None	20	12
2	Yes	Did not reach	15	None	None	20	15
3	Yes	Did not reach	10	None	None	20	17
4	Yes	Did not reach	10	None	None	20	14
5	Yes	Did not reach	15	None	None	24	17
6	Yes	Did not reach	15	None	None	20	12

On the set of 6 samples which were subject to surface application, the maximum flame height reached was observed to be  $0\pm 0.9$ mm

On the set of 6 samples which were subject to edge application, the maximum flame height reached was observed to be  $15\pm 0.9$ mm

The result for WT-1 Liquid Membrane tested to BS EN ISO 11925-2:2010 is therefore a PASS

### **Reaction to Fire Classification: E**

(Reference: Exova Report No. WF 368961)

Resistance to Delamination (Wind Loads) according to TR-004

Sample	Delamination Strength (N/mm <sup>2</sup> )
1	0.81
2	1.13
3	1.10
4	1.02
5	1.00
Mean	1.01

The Delamination Strength of the WT-1 Liquid Membrane achieved is > 0.05N/mm<sup>2</sup> required and is therefore a PASS

Resistance to Dynamic indentation according to TR-006

Sample	Resistance to Dynamic Impact
1	No penetration
2	No penetration
3	No penetration
4	No penetration
5	No penetration

There was no penetration of the Liquid Membrane following Dynamic Impact and is therefore a PASS.

Resistance to Static Indentation according to TR-007

Sample	Substrate	Level	Load (N)	Water/Spark penetration	>80% of depth
1	MDF	L1	70	No	No
2	MDF	L1	70	No	No
3	MDF	L1	70	No	No
1	STEEL	L1	70	No	No
2	STEEL	L1	70	No	No
3	STEEL	L1	70	No	No
1	MDF	L2	150	No	No
2	MDF	L2	150	No	No
3	MDF	L2	150	No	No
4	STEEL	L2	150	No	No
5	STEEL	L2	150	No	No

The WT-1 Liquid Membrane achieved < 80% depth of moved distance by the steel rod with 70 and 150N loads and thus achieved a Pass with L1 & L2 levels of resistance.

User Load category P1 & P2: PASS



Resistance to Fatigue Movement according to TR-008

Sample	Resistance to Fatigue movement	Watertightness
1	No failure	Pass
2	No failure	Pass
3	No failure	Pass

Resistance to Low Temperatures (Crack-Bridging capability) according to TR-013

Sample	Cure time	Adhesion failure/rupture	Watertightness
1	7 days	None	Pass
2	7 days	None	Pass
3	7 days	None	Pass

**These results relate only to the material tested**

Work carried out and recorded by the following personnel:



**Paula Fountain**  
Laboratory Technician



**Richard Wright**  
Laboratory Technician

Work approved by the following personnel:



**L J Komatsu ACQI**  
*Technical Manager*

*This Report shall not be reproduced except in full,  
without the prior approval of 4ward Testing Ltd in writing.*

..... **END** .....

