Test Report No. 7191067958-MEC13/02B-ED
dated 30 Sep 2013

PSB Singapore

Choose certainty. Add value.

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

SUBJECT:

Testing of liquid-applied polyurethane waterproofing membrane

TESTED FOR:

Maris Polymers S.A.
Industrial area of Inofita
32 011Inofita
Greece

Attn: Mr Lance Khoo

SAMPLE DESCRIPTION:

The following item was received on 12 Aug 2013 as shown:

Sample	Size	Quantity
'Mariseal 670' Liquid sample	1 kg/tin	2 tins

The test sample was prepared by TUV SUD PSB Pte Ltd.

Substrate	Area of application	Quantity
200 mm x 200 mm x 50 mm concrete slab	200 mm x 200 mm	1 pc

TEST METHOD:

Adhesion-to-substrate

Adopted ASTM D4541 : 2009 Standard Test Method For Pull-Off Strength Of Coatings Using Portable Adhesion Testers

Test area	:	50 mm x 50 mm
Crosshead speed	:	5 mm/min
No. of determinations	:	3

TÜV SÜD PSB

Laboratory:
TÜV SÜD PSB Pte. Ltd.
Testing Services
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testing@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
3 Science Park Drive, #04-01/05
The Franklin, Singapore 118223

CONDITIONING:

Unless otherwise specified, all test specimens were conditioned at 23 ± 2°C, 70 ± 15% relative humidity and tested at 23 ± 2°C, 65 ± 5% relative humidity. The adhesion-to-substrate test was conducted at 23 ± 2°C and 50 ± 5% relative humidity.

TEST RESULS:

Test	Unit	'Mariseal 670'
Adhesion-to-substrate, average	N/mm^2	0.6

REMARKS:

Test age : 14-day cure in air minimum prior to test for adhesion-to-substrate test.

Eddie Suwand
Senior Associate Engineer

Eng Aik How
Engineer
Building
Mechanical Centre

PSB Singapore

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1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.

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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011

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SUBJECT:

Testing of liquid-applied polyurethane waterproofing membrane

TESTED FOR:

Maris Polymers S.A.
Industrial area of Inofita
32 011Inofita
Greece

Attn: Mr Lance Khoo

SAMPLE DESCRIPTION:

The following items were received as shown:

Sample	Size	Quantity	Date received
'Mariseal 670' Cured sheet	400 mm x 350 mm 300 mm x 210 mm	1 pc 1 pc	12 Aug 2013 23 Sep 2013

TEST METHODS:

Tensile Properties

1. ASTM D412 : 2006a Standard Test Method For Vulcanized Rubbers And Thermoplastic Elastomers-Tension

Test specimen	:	Dumbbell shape, die C
Gauge length	:	25 mm
Grip length	:	64 mm
Crosshead speed	:	500 mm/min
No. of determinations	:	5

Tear Strength

2. ASTM D624 : 2007 Standard Test Method For Tear Strength Of Conventional Vulcanized Rubber And Thermoplastic Elastomers

Test specimen	:	Tear test specimen
Grip length	:	25.4 mm
Crosshead speed	:	500 mm/min
No. of determinations	:	5

TÜV SÜD PSB

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3. Puncture Strength

ASTM E154 : 2008a Standard Test Methods For Water Vapor Retarders Used In Contact With Earth Under Concrete
Slabs, On Walls, Or As Ground Cover
Section 10 : Resistance To Puncture

Test size	:	300 mm x 300 mm
Crosshead speed	:	6 mm/min
No. of determination	:	1

Water Absorption

4. Adopted ASTM D 570 : 2005 Standard Test Method For Water Absorption Of Plastics

Test size	:	75 mm x 25 mm
Pre-conditioning before immersion	:	50 ± 3°C for 24 hours
Immersion duration	:	23 ± 1°C for 24 hours
No. of determinations	:	3

Hydrostatic Pressure

5. DIN 16726 : 1986 Plastic Roofing Felt And Waterproofing Sheet Testing
Section 5.11 : Behaviour Under Hydrostatic Pressure

Apparatus	:	Slotted disc pressure tester
Test specimen dimensions	:	∅130 mm
Test condition	:	3 bar for 1 hour
No. of determination	:	1

CONDITIONING:

Unless otherwise specified, all test specimens were conditioned at 23 ± 2°C, 70 ± 15% relative humidity and tested at 23 ± 2°C, 65 ± 5% relative humidity. The tensile properties, tear strength and puncture strength tests were conducted at 23 ± 2°C and 50 ± 5% relative humidity.

TEST RESULTS:

Test	Unit	'Mariseal 670'
1.		
a. Maximum Tensile Strength, median	N/mm^2	4.7
b. Elongation At Break, median	%	685.8
c. Tensile Strength At 100% Elongation, median	N/mm^2	1.0
d. Tensile Modulus Of Elasticity, median	N/mm^2	7.9
2. Tear Resistance, average	N/mm	15.4
3. Puncture Strength	N	185.5
4. Water Absorption, average	%	0.5
5. Hydrostatic Pressure	-	No rupture

REMARKS:

1. The cured sheets were fully cured upon receipt as specified by the client.
2. The tensile properties were specified by the client.
3. One piece of cured sheet was tested for puncture strength test due to insufficient sample.

Eddie Suwand
Senior Associate Engineer

Eng Aik How
Engineer
Building
Mechanical Centre

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July 2011

MARIS POLYMERS S.A.
Industrial Area of Inofita
GR-32011 Inofita
Greece

DECLARATION OF PERFORMANCE

according Annex III of the Regulation (EU) No 305/20111
amended by Commissions delegated Regulation (EU) No 574/2014

1. Unique identification code of the product-type: **MARISEAL 670**

2. Intended use: Liquid-applied water impermeable product, type RM for installations on walls and floors, beneath ceramic tiling (bonded with C2 adhesive in accordance with EN 12004)

3. Manufacturer: **MARIS POLYMERS S.A.**
Industrial Area of Inofita
GR-32011 Inofita
Greece

4. Authorised representative: Not relevant

5. System of assessment and verification of constancy of performance: **System 3**

6. Harmonised standard: **EN 14891: 2012/AC: 2013**
Liquid-applied water impermeable products for use beneath ceramic tiling bonded with adhesives - Requirements, test methods, evaluation of conformity, classification and designation.

Notified body: **No. 1301**
TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ, n. o.
Studená 3, 821 04 Bratislava, Slovak Republic

7. Declared performances:

Essential characteristics	Performance	Test standard	Harmonized technical specification
Initial tensile adhesion strength	≥ 0,5 N/mm^2	EN 14891, Clause A6.2	**EN 14891: 2012 /AC: 2012**
Waterproofing	No penetration	EN 14891, Clause A.7	
Crack bridging ability under standard conditions	≥ 0,75 mm	EN 14891, Clause A.8.2	
Tensile adhesion strength after heat ageing	≥ 0,5 N/mm^2	EN 14891, Clause A6.5	
Tensile adhesion strength after water contact	≥ 0,5 N/mm^2	EN 14891, Clause A6.4	
Tensile adhesion strength after contact with lime water	≥ 0,5 N/mm^2	EN 14891, Clause A6.9	
Tensile adhesion strength after freeze-thaw cycles	≥ 0,5 N/mm^2	EN 14891, Clause A6.6	
Release dangerous substances	see MSDS	-	-

The performance of the product identified above is in conformity with the set of declared performances. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

MARIS POLYMERS SA