

Test Report No. 7191201095-MEC18-ED
dated 20 Feb 2019



PSB Singapore

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SUBJECT:

Testing of flexible-cementitious waterproofing membrane.

TESTED FOR:

Schomburg GmbH & Co.KG
Aquafinstrasses 2-8
D-32760 Detmold
Germany

Attn: Mr Holger Sass

SAMPLE DESCRIPTION:

The following items were received on 5 Dec 2018 as shown:

Sample	Size	Quantity
'Schomburg Aquafin 2K/M-Plus' (refer to Photo 1)		
Part A Powder : 'Aquafin 2K/M-Plus'	25 kg	1 bag
Part B Liquid : 'Uniflex-M-Plus'	10 kg	1 bucket

The test samples were prepared by TÜV SÜD PSB Pte Ltd.

As specified by the client, the mix ratio was 25 parts of powder to 10 parts of liquid by weight.

Substrate	Area of application	Quantity
a. 286 mm x 219 mm release paper	275 mm x 210 mm	6 pcs
b. 200 mm x 200 mm x 50 mm concrete slab	200 mm x 200 mm	4 pcs
c. 75 mm x 40 mm x 25 mm concrete t-block	50 mm x 50 mm	3 pcs

TEST METHODS:

Material Identification/Verification

1. ASTM E1252 : 1998 (2013) e1 Standard Practice For General Techniques For Obtaining Infra-Red Spectra For Qualitative Analysis
Material Identification/Verification By Fourier Transform Infra-Red Spectrometric Analysis (FTIR)



TÜV SÜD PSB

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Set-to-touch

6. Adopted ASTM D1640/D1640M : 2014 Standard Test Methods For Drying, Curing Or Film Formation Of Organic Coatings At Room Temperature

Tensile Properties

7. ASTM D412 : 2016 Standard Test Method For Vulcanized Rubbers And Thermoplastic Elastomers-Tension

Test Conditions:

- a. Before ageing
- b. After ageing at 50°C in oven for 2 weeks
- c. After chemical immersion for 3 days
 - i. 0.5% NaOCl (Sodium Hypochlorite)
 - ii. 1.25% NH₄OH (Ammonium Hydroxide)
 - iii. 3.7% HCl (Hydrochloric Acid)

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

Chloride Content

8. Chloride Content By Potentiometric Titration

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, crack bridging, shore hardness, set-to-touch and tensile properties tests were conducted at 23 ± 2°C and 50 ± 5% relative humidity.

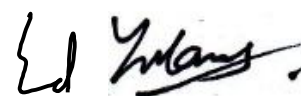
TEST RESULTS:

Test	Unit	'Schomburg Aquafin 2K/M-Plus'	HDB specification: Flexible-Cementitious Waterproof Membrane (Water-Based) For New Construction Project & Upgrading Contracts For Use With Concrete Water Tank
1. Material Identification/Verification By FTIR	-	Styrene-acrylate co-polymer (refer to Figure 1)	Polymer which undergoes hydrolysis should not be used
2. Water Penetration, average	mm	0, no water penetration	Depth of penetration should be 0

Ed Zulans

TEST RESULTS:

Test	Unit	'Schomburg Aquafin 2K/M-Plus'	HDB specification: Flexible-Cementitious Waterproof Membrane (Water-Based) For New Construction Project & Upgrading Contracts For Use With Concrete Water Tank
3. Adhesion-to-substrate, average	N/mm ²	0.6	≥ 0.3 N/mm ²
4. Crack Bridging	mm		
a. 2 mm		No cracks	No cracking at 2 mm width No cracks after 10 cycles of stretching and closing to a width of 1 mm
b. 1 mm		No cracks	
5. Hardness (Shore A), median	-	65	≥ 40
6. Set-to-touch (based on one coat)	mins	60	Should touch dry within 2 hours
7.			
a. Maximum Tensile Strength, median	N/mm ²		≥ 1.5 N/mm ²
i. Before ageing		1.7	≥ 1.2 N/mm ² and -ve change ≤ 40% No limit for positive change
ii. After ageing at 50°C in oven for 2 weeks		1.9	
change in tensile strength	%	+11.8	
iii. After chemical immersion for 3 days			
0.5% NaOCl		1.9	
change in tensile strength	%	+11.8	
1.25% NH ₄ OH		1.9	
change in tensile strength	%	+11.8	
3.7% HCl		1.8	
change in tensile strength	%	+5.9	
b. Elongation At Break, median	%		≥ 150%
i. Before ageing		191.6	≥ 120% and -ve change ≤ 40% No limit for positive change
ii. After ageing at 50°C in oven for 2 weeks		197.0	
change in elongation	%	+2.7	
iii. After chemical immersion for 3 days			
0.5% NaOCl		149.4	
change in elongation	%	-22.0	
1.25% NH ₄ OH		179.2	
change in elongation	%	-6.5	
3.7% HCl		161.8	
change in elongation	%	-15.6	
c. Elongation At Break, displacement	mm		
i. Before ageing		47.9	
ii. After ageing at 50°C in oven for 2 weeks		49.3	
iii. After chemical immersion for 3 days			
0.5% NaOCl		37.4	
1.25% NH ₄ OH		44.8	
3.7% HCl		40.4	



TEST RESULTS:

Test	Unit	'Schomburg Aquafin 2K/M-Plus'	HDB specification: Flexible-Cementitious Waterproof Membrane (Water-Based) For New Construction Project & Upgrading Contracts For Use With Concrete Water Tank
8. Chloride Content	% weight	0.02	≤ 0.1%

REMARKS:

Test age : 28 days cured in air minimum prior to test unless otherwise specified.



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Testing Officer
Senior Associate Engineer



Fabien Tan
Engineer
Real Estate & Infrastructure
Mechanical Centre



Photo 1 : 'Schomburg Aquafin 2K/M-Plus'

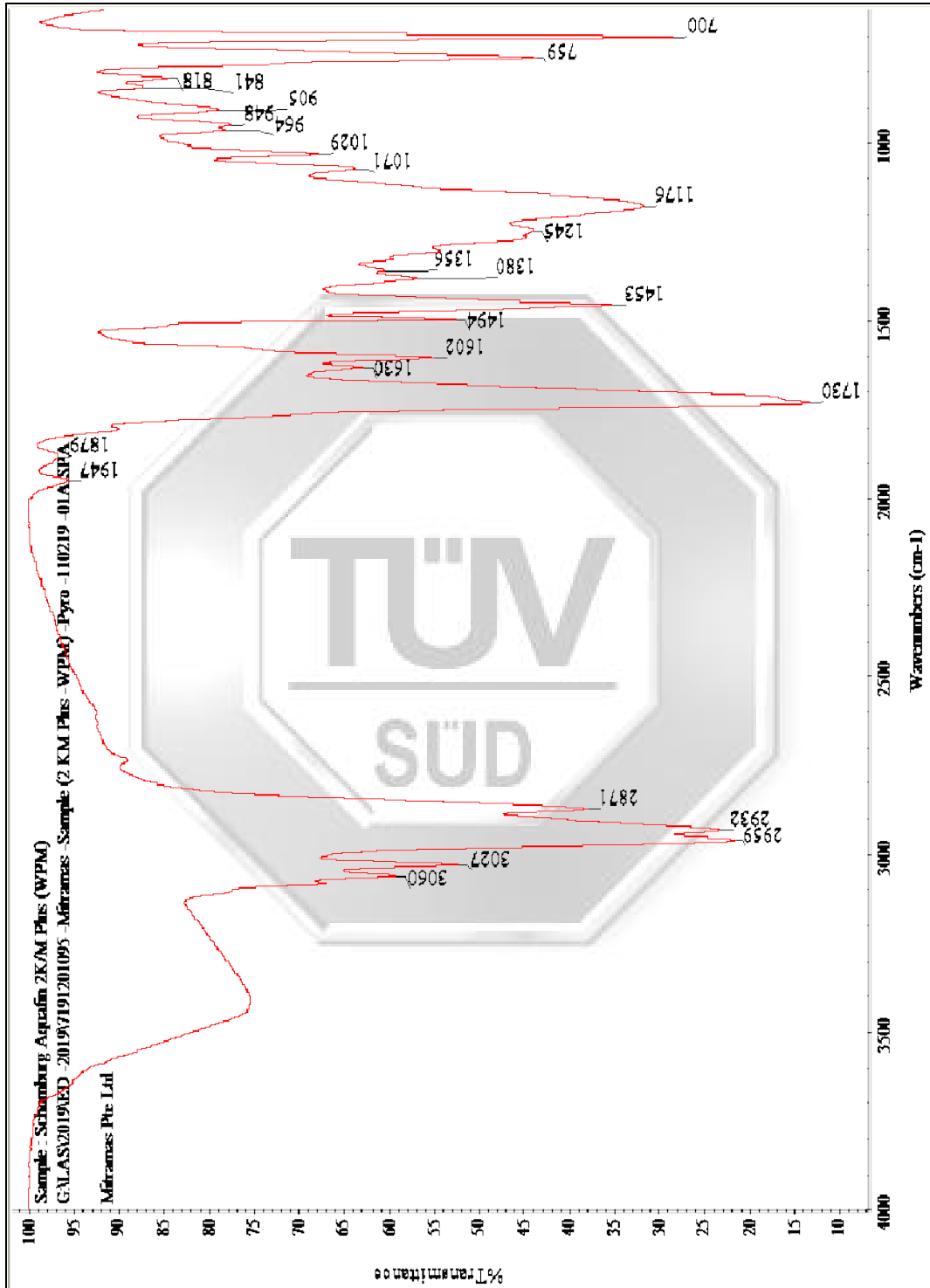


Figure 1 : IR spectrum of 'Schomburg Aquafin 2K/M-Plus'



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