TEST REPORT

DC13065-001

REPORT ON TESTING OF PHYSICAL PROPERTIES FOR THREE GLASS FIBRE REINFORCED POLYESTER ROOFING SHEETS

CLIENT

Alsynite One NZ Limited
7 De Leeuw Place
Te Rapa
Hamilton, 3200

All tests and procedures reported herein, unless indicated, have been performed in accordance with BRANZ ISO9001:2015 Certification

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LIMITATION

The results reported here relate only to the item/s tested.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

SIGNATORIES

Author

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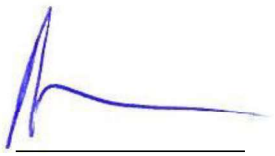
Senior Technician Materials
BRANZ



Reviewer

Nick Marston
Materials Team Leader
BRANZ

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1. SCOPE

BRANZ was requested by the client to test five physical properties and the thermal conductivity of three Glass Fibre Reinforced Polyester Roofing products (see Section 2 below). The test methods used are listed in Section 3 below.

2. PRODUCT

The client supplied eight 600x600 mm curved sheets of each product. They were all logged in the BRANZ Materials Sample Register. All sample material was stored and tested in constant climate conditions of 23±2°C & 50±5%RH.

Product	BRANZ Sample No.
Topglass Gelcoat 2400gsm	20/649
Topglass Gelcoat 3050gsm	20/650
Topglass Gelcoat Ultrasafe 3660gsm	20/651

Table 1: Products supplied for testing

3. METHOD

The client supplied the following test methods to be used:

Test Method		Standard
1	Impact Resistance	AS/NZS4257.6:1994
2	Compressive Strength	ISO604-2002
3	Flexural Strength	ASTMD 790-10
4	Specific Gravity	ASTM D792-08
5	Tensile Strength	ISO527-1 & ISO527-2
6	Thermal Conductivity	ASTM C518-10

Table 2: Test methods used

4. RESULTS

4.1 Impact Resistance

Test:	Impact Resistance
Method:	AS/NZS 4257.6:1994
Weight:	201.5 g
Drop height:	1.0 m
Impact energy:	1.977 J
No. of specimens:	50 per product

Product	Result
Topglass Gelcoat 2400gsm	Pass
Topglass Gelcoat 3050gsm	Pass
Topglass Gelcoat Ultrasafe 3660gsm	Pass

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4.2 Compressive strength

Test:	Compressive Strength
Method:	ISO 604-2003
Specimen size:	10x10mm
Load rate:	1.0 mm/min

Topglass Gelcoat 2400gsm

Specimen No.	Compressive Strength (MPa)
1	277
2	378
3	439
4	420
5	434
Mean	**390**

Topglass Gelcoat 3050gsm

Specimen No.	Compressive Strength (MPa)
1	346
2	347
3	321
4	307
5	315
Mean	**327**

Topglass Gelcoat Ultrasafe 3660gsm

Specimen No.	Compressive Strength (MPa)
1	363
2	403
3	378
4	389
5	386
Mean	**384**

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4.3 Flexural Strength

Test:	Flexural Strength
Method:	ASTM D790-10

Topglass Gelcoat 2400gsm	
Span:	25.0 mm
Load rate:	0.72 mm/min.
Specimen No.	Flexural Strength (MPa)
1	177
2	244
3	145
4	166
5	200
6	182
Mean	**186**

Topglass Gelcoat 3050gsm	
Span:	32.2 mm
Load rate:	0.86 mm/min.
Specimen No.	Flexural Strength (MPa)
1	187
2	144
3	169
4	125
5	148
6	134
Mean	**151**

Topglass Gelcoat Ultrasafe 3660gsm	
Span:	34.0 mm
Load rate:	0.91 mm/min.
Specimen No.	Flexural Strength (MPa)
1	171
2	209
3	168
4	182
5	177
6	181
Mean	**181**

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4.4 Specific Gravity & Thickness

Test:	**Specific Gravity**
Method:	ASTM D792-08
No. of Specimens:	3 per product

Product	**Mean Specific Gravity @23°C**
Topglass Gelcoat 2400gsm	1.436
Topglass Gelcoat 3050gsm	1.475
Topglass Gelcoat Ultrasafe 3660gsm	1.571

Thickness Measurements	
No. of measurements:	15 per product

Product	**Mean thickness (mm)**
Topglass Gelcoat 2400gsm	1.44
Topglass Gelcoat 3050gsm	2.01
Topglass Gelcoat Ultrasafe 3660gsm	2.13

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4.5 Tensile Strength

Test:	Tensile Strength
Method:	ISO 527 Parts 1&2
Test speed:	50 mm/min.
Specimen Type:	1A

Topglass Gelcoat 2400gsm

Specimen No.	Tensile Strength (MPa)
1	90
2	97
3	100
4	104
5	104
Mean	**99**

Topglass Gelcoat 3050gsm

Specimen No.	Tensile Strength (MPa)
1	88
2	77
3	76
4	107
5	108
Mean	**91**

Topglass Gelcoat Ultrasafe 3660gsm

Specimen No.	Tensile Strength (MPa)
1	153
2	160
3	179
4	164
5	179
Mean	**167**

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4.6 Thermal Conductivity

Test:	Thermal Conductivity
Method:	ASTM C518-10
Sample size:	600x600mm

Product	Topglass Gelcoat 2400gsm	Topglass Gelcoat 3050gsm	Topglass Gelcoat Ultrasafe 3660gsm
Sample weight (g)	711	1000	1221
Test Grammage (g/m^2)*	1959	2801	3336
Test Density (kg/m^3)*	1232	1291	1373
Test thickness (mm)*	1.59	2.17	2.43
Mean temperature (°C)	23	23	23
Temperature difference (K)	0.4	1.2	1.2
Heat-flux (W/m^2)	53.45	97.54	94.87
Thermal resistance (m^2K/W)	0.0080	0.0123	0.0127
Thermal conductivity (W/mK)	**0.218**	**0.176**	**0.192**
Diff between heat flux transducers (%)	26.9	2.8	1.4

*Note : The values for some properties may differ from results stated elsewhere in this report. This is mainly due to the curved sample sheets being flattened in the heat flowmeter while under test to ensure direct contact with the plattens.

5. REFERENCES

AS/NZS4257.6:1994 Plastic roof and wall cladding materials – Method of test. Method 6: Determination of impact resistance.

ISO604:2002 Plastics – Determination of compressive properties.

ASTM D790-10 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

ASTM D792-08 Standard Test Methods for Density and Specific Gravity (Relative Density of Plastics by Displacement.

ISO527-1:2019 Plastics – Determination of tensile properties – Part 1: General Principles

ISO527-2:2012 Plastics – Determination of tensile properties – Part 2: Test conditions for moulding and extrusion plastics.

ASTM C518-10 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

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