

Test Report No. 7191112533-MEC15-KSY (221406274)
dated 29 JUN 2015



PSB Singapore

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SUBJECT

Testing of High Pressure Laminate

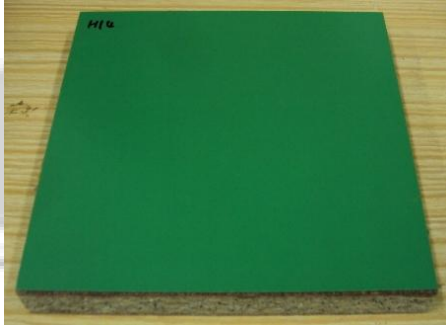
TESTED FOR

Maica Laminates Sdn Bhd
5100, Lorong Mak Mandin 5
Mak Mandin Industrial Estate
13400 Butterworth
Pulau Pinang
Penang Malaysia

Attn: Mr Ooi Ee Chia

SAMPLE DESCRIPTION:

The following samples were submitted by Maica Laminates Sdn Bhd on 02 April 2015 for testing:

Label	Nominal Dimension	Qty	Typical Photograph
H1	100 mm x 100 mm x 1 mm, 6.7 mm hole at center	6 pcs	
H2	50 mm x 50 mm x 1 mm	6 pcs	
H3	100 mm x 100 mm x 1 mm	6 pcs	
H4	230 mm x 230 mm x 20 mm	3 pcs	
H5	250 mm x 50 mm x 1 mm (fibre direction)	8 pcs	
H6	250 mm x 50 mm x 1 mm (cross fibre direction)	8 pcs	
H7	230 mm x 230 mm x 20 mm	6 pcs	
H8	230 mm x 230 mm x 20 mm	7 pcs	

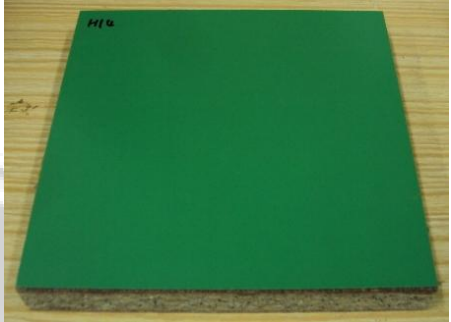


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TUV[®]

SAMPLE DESCRIPTION: (CONT'D):

Label	Nominal Dimension	Qty	Typical Photograph
H9	150 mm x 50 mm x 1 mm	8 pcs	
H10	100 mm x 100 mm x 1 mm, 6.7 mm hole at center	6 pcs	
H11	70 mm x 70 mm x 1 mm	10 pcs	
H12	120 mm x 40 mm x 1 mm	3 pcs	
H13	230 mm x 230 mm x 20 mm	2 pcs	
H14	150 mm x 150 mm x 20 mm	5 pcs	
H15	25 mm x 25 mm x 1 mm	4 pcs	

TEST METHODS: (AS SPECIFIED BY THE CLIENT):

EN 438-3 : 2005

High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) -

Part 3: Classification and specifications for laminates less than 2mm thick intended for bonding to supporting substrates

BS EN 438-2 : 2005

High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) -

Part 2: Determination of properties

1 Resistance to surface wear

Nominal specimen dimensions : 100 mm x 100 mm x 1 mm (with a 6.7 mm hole at the center)

No. of determinations : 3

2. Resistance to immersion in boiling water

Nominal specimen dimensions : 50 mm x 50 mm x 1 mm

No. of determinations : 3






TEST METHODS: (CONT'D):

3. Resistance to water vapour

Nominal specimen dimensions : 100 mm x 100 mm x 1 mm
No. of determinations : 1

4. Resistance to dry heat

Nominal specimen dimensions : 230 mm x 230 mm x 20 mm
No. of determinations : 1

5. Dimensional stability at elevated temperature

Nominal specimen dimensions : 250 mm x 50 mm x 1 mm
No. of determinations : 4 per fibre and cross fibre directions

6. Resistance to impact by small diameter ball

Nominal specimen dimensions : 230 mm x 230 mm x 20 mm
No. of determinations : 1

7. Resistance to impact by large diameter ball

Nominal specimen dimensions : 230 mm x 230 mm x 20 mm
No. of determinations : 5

8. Resistance to cracking under stress

Nominal specimen dimensions : 150 mm x 50 mm x 1 mm
No. of determinations : 3

9. Resistance to scratching

Nominal specimen dimensions : 100 mm x 100 mm x 1 mm (with a 6.7 mm hole at the center)
No. of determinations : 1



TEST METHODS: (CONT'D):

10. Resistance to Staining

Nominal specimen dimensions : 70 mm x 70 mm x 1 mm
Reagent used : a) Acetone (16h)
b) Coffee (16h)
c) 25% Sodium Hydroxide (10min)
d) 30% Hydrogen Peroxide (10min)
e) Shoe Polish (10min)
No. of determinations : 2

11. Lightfastness (xenon arc)

Nominal specimen dimensions : 120 mm x 40 mm x 1 mm
Duration : 100 hrs
No. of determinations : 1

12. Resistance to cigarette burn

Nominal specimen dimensions : 230 mm x 230 mm x 20 mm
No. of determinations : 1

13. Resistance to wet heat

BS EN 12721:2009

Furniture - Assessment of surface resistance to wet heat

Nominal specimen dimensions : 150 mm x 150 mm x 20 mm
No. of determinations : 1

14. Density

BS EN ISO 1183-1:2012

Methods for determining the density of non-cellular plastics

Part 1 : Immersion method, liquid pyknometer method and titration method

Nominal specimen dimensions : 25 mm x 25 mm x 1 mm
No. of determinations : 3

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TEST RESULTS:

Characteristics	Label	unit	Results
1. Resistance to surface wear, average a) Initial point b) Wear value	H1	Revolutions	525 1350
2. Resistance to immersion in boiling water Appearance	H2	Rating Other finishes	5
3. Resistance to Water Vapour Appearance	H3	Rating Other finishes	5
4. Resistance to Dry Heat (180°C) Appearance	H4	Rating Other finishes	5
5. Dimensional Stability at Elevated Temperature, average i) Dry-heat test (70 °C for 24 h) a) Longitudinal Direction b) Transverse Direction ii) High-humidity test (40 °C / 92 % for 96 h) a) Longitudinal Direction b) Transverse Direction	H5 H6	Cumulative Dimensional Change %	0.25 0.91 0.25 0.41

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TEST RESULTS (CONT'D):

Characteristics	Label	unit	Results
6. Resistance to Impact by Small Diameter Ball Spring force	H7	N	29
7. Resistance to Impact by Large Diameter Ball a) Drop Height b) Indent Diameter	H8	mm mm	> 1200 0
8. Resistance to cracking under stress Appearance	H9	Rating	5
9. Resistance to Scratching Force	H10	Rating	4
10. Resistance to Staining Appearance a) Groups 1 & 2 b) Group 3 i) Sodium hydroxide ii) Hydrogen peroxide iii) Shoe polish	H11	Rating	5 5 5 4
11. Lightfastness	H12	Grey Scale Rating	> 4
12. Resistance to Cigarette Burn Appearance	H13	Rating	5
13. Resistance to wet heat (100 °C)	H14	Rating Other finishes	5
14. Density	H15	g/cm ³	1.44



NOTE:

Detail information of the tests were shown in Appendix 1.

A handwritten signature in black ink, appearing to read 'Kong Siew Yong'.

Kong Siew Yong
Product Manager

A handwritten signature in blue ink, appearing to read 'Hu Guang Xia'.

Dr Hu Guang Xia
Senior Consultant
Polymer Products
Mechanical Centre



Appendix 1

No.	Label	Test items	EN 438 : Part 2	Attached to chipboard	Nominal Specimen Dimensions	Quantity
1	H1	Resistance to Surface Wear	Clause 10	No	100 mm x 100 mm (with a hole of 6.7 mm at the centre)	6
2	H2	Resistance to immersion in boiling water	Clause 12	No	50 mm x 50 mm	6
3	H3	Resistance to water vapour	Clause 14	No	100 mm x 100 mm	6
4	H4	Resistance to dry heat (180 °C)	Clause 16	Yes	230 mm x 230 mm	3
5	H5	Dimensional stability at elevated temperature	Clause 17	No	250 mm x 50 mm (fibre direction)	8
	H6				250 mm x 50 mm (cross fibre direction)	8
6	H7	Resistance to impact by small diameter ball	Clause 20	Yes	230 mm x 230 mm	6
7	H8	Resistance to impact by large diameter ball	Clause 21	Yes	230 mm x 230 mm	7
8	H9	Resistance to cracking under stress	Clause 23	No	150 mm x 50 mm	8
9	H10	Resistance to scratching	Clause 25	No	100 mm x 100 mm (with a hole of 6.7 mm at the centre)	6
10	H11	Resistance to staining	Clause 26	No	70 mm x 70 mm	10
11	H12	Lightfastness	Clause 27	No	120 mm x 40 mm	3
12	H13	Resistance to cigarette burn	Clause 30	Yes	230 mm x 230 mm	2
13	H14	Resistance to wet heat (100°C)	EN 12721 : 2009	Yes	150 mm x 150 mm	5
14	H15	Density	EN ISO 1183-1 : 2012	No	25 mm x 25 mm	4

The arrow is mark as fibre direction →






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July 2011

