

Prüfbericht-Nr.: <i>Test Report No.:</i>	16082797 001	Auftrags-Nr.: <i>Order No.:</i>	174064914	Seite 1 von 9 Page 1 of 9	
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	21.04.2017		
Auftraggeber: <i>Client:</i>	DongGuan Windeco Limited Rui Hua Road, Hengli Town, Dongguan City, Guangdong Province, China				
Prüfgegenstand: <i>Test item:</i>	High Pressure Laminate				
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	High Pressure Laminate				
Auftrags-Inhalt: <i>Order content:</i>	Partial Physical test				
Prüfgrundlage: <i>Test specification:</i>	EN 438-2: 2016, Partial tests.				
Wareneingangsdatum: <i>Date of receipt:</i>	21.04.2017				
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000558256-001				
Prüfzeitraum: <i>Testing period:</i>	22.04.2017 - 16.05.2017				
Ort der Prüfung: <i>Place of testing:</i>	Unit 201, NO.7 Caipin Road, Guangzhou, P.R. China				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Guangdong) Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Siehe Sonstiges / See Other				
geprüft von / tested by:		kontrolliert von / reviewed by:			
05.06.2017 Leo Zhou / Test Engineer		05.06.2017 Allen Guo / Reviewer			
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other: Per client's requirements, verdict of test result is according to applicable product standards.					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

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Liste der verwendeten Prüfmittel
List of used test equipment

Prüfmittel <i>Test equipment</i>	Prüfmittel-Nr. / ID-Nr. <i>Equipment No. / ID-No.</i>	Nächste Kalibrierung <i>Next calibration</i>
See remark.		

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Produktbeschreibung
Product description

1	Produktdetails <i>Product details</i>	High Pressure Laminate
2	Maße / Gewicht <i>Dimensions / Weight</i>	N/A
3	Bedienelemente <i>Operating elements</i>	N/A
4	Ausstattung / Zubehör <i>Equipment / Accessories</i>	N/A
5	Verwendete Materialien <i>Used materials</i>	Kraft paper and resin
6	Sonstiges <i>Other</i>	N/A
Pic. 1: Front view		
		Blank
Blank		Blank

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Absatz	EN 438-2: 2016, Partial tests.	Messergebnisse - Bemerkungen	Bewertung
Clause	Anforderungen - Prüfungen / Requirements - Tests	Measuring results - Remarks	Evaluation

Resistance to surface wear

Test method	EN 438-2:2016 Clause 10
Test Condition	(23±2) °C, (50±5)%RH Specimen: 100x100x0.85mm Abrasive paper strips, : S-42 Load: 5.2N/wheel

Result:

IP:	150
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Resistance to immersion in boiling water

Test method	EN 438-2:2016 Clause 12
Test Condition	72h at (23±2) °C, (50±5)%RH Boiling for (120±5)min, Cooled for (15±5)min in distilled water at (23±2) °C,

Result:

The average percentage increase in mass	5.0%
The average percentage increase in thickness	6.2%
Surface rating scale	Rating 4: cured surface after test
Edge rating scale	Rating 5

Resistance to water vapour

Test method	EN 438-2:2016 Clause 14
Test Condition	(23±2) °C, (50±5)%RH Specimen: 100x100x0.85mm, Flask mouth diameter: 37mm, Condition: Water vapour, 1h

Result:

Appearance rating Scale	Rating 5
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Expression of results:

Rating	Description
5	No visible change
4	Slight change of gloss and/or colour, only visible at certain viewing angles
3	Moderate change of gloss and/or colour
2	Marked change of gloss and/or colour
1	Blistering and/or delamination

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Resistance to dry heat

Test method	EN 438-2:2016 Clause 16
Test Condition	(23±2) °C, (50±5)%RH Specimen size: (230±5)mm square, Heat source temperature: (160±1) °C, Contact time: 20 min, Resistance to dry heat rating scale is listed in expression of results.

Result:

Resistance to dry heat scale:	Rating 5
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Expression of results:

Rating	Description
5	No change Test area indistinguishable from adjacent surrounding area
4	Minor change Test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer's eye, e.g. discoloration, change in gloss and colour.
3	Moderate change Test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour, no change in the surface structure, e.g. deformation, cracking, blistering
2	Significant change Test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour, and / or structure of the surface slightly changed, e.g. slight cracking, slight blistering
1	Strong change The structure of the surface being distinctly changed e.g. strong cracking, strong blistering and / or discoloration, change in gloss and colour, and / or the surface material being totally or partially delaminated

Dimensional stability at elevated temperature:

Test method	EN 438-2:2016 Clause 17.4.2 Resistance to oven dry - heat test
Test Condition	Specimen size: (200±0.8)mm*(50±0.1)mm, Pre-condition: 72h at (23±2) °C, (50±5)%RH Test temperature: (70±2) °C, during time: 24h, Cool in desiccator.

Result:

Machine direction	Average change: -0.25%
Across machine direction	Average change: -0.55%

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Dimensional stability at elevated temperature:

Test method	EN 438-2:2016 Clause 17.4.3 Resistance to High - humidity test
Test Condition	Specimen size: (200±0.8)mm*(50±0.1)mm, Pre-condition: 72h at (23±2) °C, (50±5)%RH Test condition: (96±4h) at (40±2) °C, (90~95)%RH,

Result:

Machine direction	Average change: -0.10%
Across machine direction	Average change: -0.20%

Resistance to impact by small – diameter ball

Test method	EN 438-2:2016 Clause 20
Test Condition	Specimen size: (230±5)mm square, Pre-condition: 72h at (23±2) °C, (50±5)%RH The maximum spring compression force of impact testr: 90N. Impact steel ball diameter: 5mm

Result:

Impact resistance	34 N
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Resistance to impact by large – diameter ball

Test method	EN 438-2:2016 Clause 21
Test Condition	Specimen size: (230±5)mm square, Steel ball diameter: 42.8mm Steel ball mass: 321g Drop height: 2400mm (Test result exceeded the upper limit of the tester.)

Result:

Indentation diameter	9.17mm
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Resistance to cracking under stress

Test method	EN 438-2:2016 Clause 23
Test Condition	Specimen size: (230±5)mm square, Specimen: 150x50x0.85mm Condition: (50±2) °C, 6h

Result:

Appearance rating scale	Rating 5
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Expression of results:

Rating	Description
5	No evidence of cracking
4	Hairline cracks only visible under x 6 magnification
3	Cracks visible with normal vision (corrected if necessary) from the edge of the hole, but not extending to either edge of the specimen
2	A crack visible with normal vision (corrected if necessary) from the edge of the hole, extending to one edge of the specimen such that the specimen is not broken into two pieces
1	Specimen broken into two pieces

Resistance to scratching

Test method	EN 438-2:2016 Clause 25
Test Condition	Specimen size: (100±1)mm square, Scratch resistance rating scale is listed in expression of results

Result:

Scratch resistance rating scale	Rating 4
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Expression of results:

Rating Scale	>90% continuous double circle of scratch marks clearly visible
5	>6N
4	6N
3	4N
2	2N
1	1N

Resistance to staining

Test method	EN 438-2:2016 Clause 26
Test Condition	(23±2) °C, (50±5)%RH

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Clause	Anforderungen - Prüfungen / Requirements - Tests	Measuring results - Remarks	Evaluation

Result:

Staining agent	Test condition	Test result	
		Cover	uncover
Acetone(AR)	Apply agent at 23 °C, contact for 16h	Rating 5	Rating 5
Coffee (Nestlé®, 120g of coffee per liter of water)	Apply agent at 80 °C, contact for 16h	Rating 5	Rating 5
Sodium hydroxide(AR, 25% Solution)	Apply agent at 23 °C, contact for 16min	Rating 5	Rating 5
Hydrogen peroxide(AR, 30% Solution)		Rating 5	Rating 5
Shoe polish(Red Bird®)		Rating 5	Rating 5

Expression of results:

Numerical rating	Description
5	No change Test area indistinguishable from adjacent surrounding area
4	Minor change Test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer's eye, e.g. discoloration, change in gloss and colour.
3	Moderate change Test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour
2	Significant change Test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour, and / or structure of the surface slightly changed, e.g. slight cracking, slight blistering
1	Strong change The structure of the surface being distinctly changed and / or discoloration, change in gloss and colour, and / or the surface material being totally or partially delaminated

Light resistance(Xenon arc)

Test method	EN 438-2:2016 Clause 27 (Carry out the test in accordance with EN ISO 4892-2 with the following operating conditions)
Test Condition	Irradiance: (0.5±0.03)W/m ² @340nm Black-standard temperature: (65±3) °C Relative humidity: (50±5)% Radiant exposure dose: 306 KJ/m ² Calculated exposure time: 170h

Result:

Grey scale	4 - 5
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Resistance to cigarette burns

Test method	EN 438-2:2016 Clause 30
Test Condition	Specimen size: (230±5)mm square, Pre-condition: 72h at (23±2) °C, (50±5)%RH Cigarette used: Zhonghua Brand Soft package.
Test Condition	Cigarette consumed length before test: 10mm Burning length on Specimen: 20mm

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	Cigarette burns resistance rating scale is listed in expression of results
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Result:

Rating scale	Rating 4
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Expression of results:

Rating Scale	Expression of results
5	No visible change
4	Slight change of gloss only visible at certain viewing angles and / or slight brown stain.
3	Moderate change of gloss and / or moderate brown stain.
2	Sever brown mark, but no destruction of the surface.
1	Blistering and / or cracks.

Formaldehyde content

Test method	Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber according to ASTM D6007-2014
Test Parameters:	The test pieces was tested with: <ul style="list-style-type: none"> • Standard face and back configuration • Nonstandard sample configuration with single surface exposed • Combination testing
Specimen Conditioning	Average Temperature: 24°C Average Relative humidity: 50% Time: 7 Days Formaldehyde background concentration: <0.005ppm
Sampling	Chamber volume: 1.0m ³ Loading(L): 0.95m ² / m ³ Q/A ratio: 0.526m/h Average Temperature: 25°C Average Relative humidity: 50% Air Sampling rate: 1L/min Sampling time: 30min

Result:

	Test No.	T001	
	Material No.	M001	
Test parameter	Unit	RL	Result
Chamber Formaldehyde concentration in air at test conditions	Ppm	0.01	0.03

Abbreviation: n.d. = not detercted (< Reporting Limit)

- RL = Reporting Limit
- ppm = Parts per million
- % = Percentage
- L/min = liter per minute

Remark:

- List of used test equipment could be traceable and provided separately upon request.

*** End of test report ***