

TEST REPORT

Report Reference No.: AU12034035-3

Prepared by (name and signature) ..: Fred Bao

Approved by (name and signature) ...: Stanley Zhou

Date of issue: May 9, 2012

Contents.....: Total test report 8 pages including:
Report text: 7 pages
Appendix A for product photos: 1page
Appendix B for test data of Airborne Sound Insulation: 1page

Testing Laboratory name: Intertek Testing Services Building Products

Address.....: Building T52-8, No.1201 Gui Qiao Road, Jinqiao Development Area, Pudong District, Shanghai, China

Testing location.....: Same as above

Applicant's name: Jiangsu Xiecheng Science & Deve. Co., Ltd.

Address.....: Industrial Zone, Jinhu County, Jiangsu, China

Test specification:

Standard.....: EN 10002-1:2001, EN 310:1993, EN 1604:1997, EN 12664:2001, EN 13523-2:2001, EN 13523-4:2001, ISO 17132:2007, ISO 11359-2:1990, EN ISO 10140-2:2010

Non-standard test method.....: N/A

Test item description.....: A2 Grade Fireproof Aluminum Composite Panels

Trade Mark.....: ALMINE

Model and/or type reference.....: 4 mm

Manufacturer.....: Same as above

Rating(s).....: —

Summary of testing:

The submitted samples were tested in accordance with specified standards, and listed the result accordingly, refer to text for detail.

Intertek Testing Services Ltd., Shanghai JinQiao Branch

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Report Template Revision Date:3 Feb. 2009



Test item particulars	
Classification of installation and use	Not specified
Supply Connection	Not specified
Possible test case verdicts	
- Test case does not apply to the test object.....	N/A
- Test object does meet the requirement.....	P (Pass)
- Test object does not meet the requirement.....	F (Fail)
Testing	
Date of receipt of test item.....	March 23, 2012
Date (s) of performance of tests.....	March 26, 2012 to April 28, 2012
General remarks:	
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General product information:	
The aluminium composite panels size (length×width×thickness): 2400mm×1200mm×4 mm,	
Product Photographs were presented in Appendix A	
Sample Number: S1203265.	
Manufacturer: Jiangsu Xiecheng Science & Technology Deve. Co., Ltd.	

Performance test		
Clause	Requirement - Test	Result
Tensile strength	<p>The test was determined according to EN 10002-1:2001.</p> <p>The specimen was only the aluminum sheet. Machined the specimen according to the standard. The test loading rate was 2 MPa/s. The Yield Strength (Rp0.2), Maximum Tensile Force, Tensile Strength and elongation at break was recorded.</p>	<p>Yield Strength (Rp0.2): 63.84 Mpa</p> <p>Maximum Tensile Force: 1206.88 N</p> <p>Maximum Tensile Strength: 166.41 Mpa</p> <p>Elongation: 9.3%</p>
Modulus of Elasticity in Bending and Bending Strength	<p>The test was determined according to EN 310:1993.</p> <p>The modulus of elasticity in bending and bending strength were determined by applying a load to the centre of an aluminum composite panel that was supported at two points. The test loading rate was 10 mm/minute. The modulus of elasticity was calculated by using the slope of the linear region of the load-deflection curve. The bending strength of each test piece was calculated by determining the ratio of the bending moment M, at the maximum load Fmax, to the moment of its full cross section. Series of both transverse and longitudinal test pieces were required.</p>	<p>Bending strength:</p> <p>Transverse: 113.31 N/mm²</p> <p>Longitudinal: 108.56 N/mm²</p> <p>Modulus of elasticity in Bending:</p> <p>Transverse: 10479.20 N/mm²</p> <p>Longitudinal: 12218.16 N/mm²</p>

Performance test		
Clause	Requirement - Test	Result
Dimension Stability under Specified Temperature and Humidity Conditions	<p>The test was determined according to EN 1604:1997.</p> <p>The aluminum composite panel specimens were conditioned to equilibrium at $(23 \pm 2) ^\circ\text{C}$, $(50 \pm 5) \%$ relative humidity. And the initial length, width and thickness of specimens were determined at the same atmosphere.</p> <p>A set of test specimens were exposed in the conditions below:</p> <p>Low temperature: $(-30 \pm 3) ^\circ\text{C}$</p> <p>High humidity: $(60 \pm 2) ^\circ\text{C}$, $(90 \pm 5) \%$ relative humidity</p> <p>The durations of exposure were for 48 hours.</p> <p>The final length, width and thickness of the test specimens were determined after 48 hours exposures. Then the dimensional changes were calculated for $\Delta\epsilon_l$, $\Delta\epsilon_b$ and $\Delta\epsilon_d$ in percentage from the individual measurements</p>	<p>Low temperature:</p> <p>$\Delta\epsilon_l$: 0.1 %</p> <p>$\Delta\epsilon_b$: 0.1 %</p> <p>$\Delta\epsilon_d$: 1.0 %</p> <p>High humidity:</p> <p>$\Delta\epsilon_l$: 0.7 %</p> <p>$\Delta\epsilon_b$: 0.4 %</p> <p>$\Delta\epsilon_d$: 1.0 %</p>
Thermal Conductivity	<p>The test was determined according to EN 12664:2001.</p> <p>By using the heat flow meter apparatus, the density of heat flow rate, heat flow rate, and the metering area that the heat flow rate crosses were measured. The temperature difference across the specimen that was measured by temperature sensors fixed at surfaces in contact with the specimens was $20 ^\circ\text{C}$, and the mean temperature was $10 ^\circ\text{C}$. Then the thermal conductivity of aluminum composite panel was calculated from measured density of heat flow rate, heat flow rate, metering area and temperature difference.</p>	Thermal conductivity: $0.612 \text{ W/(m}\cdot\text{K)}$

Performance test		
Clause	Requirement - Test	Result
Specular Gloss	<p>The test was determined according to EN 13523-2:2001.</p> <p>The gloss was determined by measuring the specular reflectance. The angle of incident light was 60°. The average specular gloss of the organic coating of the aluminum panels was determined.</p>	Average Specular Gloss: 35
Pencil Hardness	<p>The test was determined according to EN 13523-4:2001.</p> <p>The coating of the aluminum panels was intentionally damaged by pencils of increasing hardness. The degree of hardness of coating was determined by the hardest lead which did not remove the coating for a minimum of 3 mm length.</p>	Pencil Hardness: 2H
T-Bend	<p>The test was determined according to ISO 17132:2007.</p> <p>The coated aluminum panel was repeatedly bent back on itself to 180°, with the coated surface on the outside of the bend. After bending, the panel was examined with a magnifying glass for cracking of the coating. The minimum diameter to which the test panel was bent without cracking or loss of adhesion was determined.</p>	T-bend: 2T
Linear Thermal Expansion	<p>The test was determined according to EN 11359-2:1999.</p> <p>The Linear Thermal Expansion under (-30 °C - +30 °C) at the thickness direction was determined.</p>	Linear Thermal Expansion: 43.8×10^{-6}

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Performance test		
Clause	Requirement - Test	Result
Airborne Sound Insulation	The test was determined according to EN ISO 10140-2:2010. Sound source: Pink noise; Testing Area: 10.08 m ² ; Environment: Source room volume 62 m ³ , Receiving room volume 99 m ³ . Air temperature 20°C. Air humidity 42%.	25(-1, -4) dB The detailed test results are shown in Appendix B.

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Jiangsu Xiechen

Intertek Testing Services Ltd., Shanghai JinQiao Branch

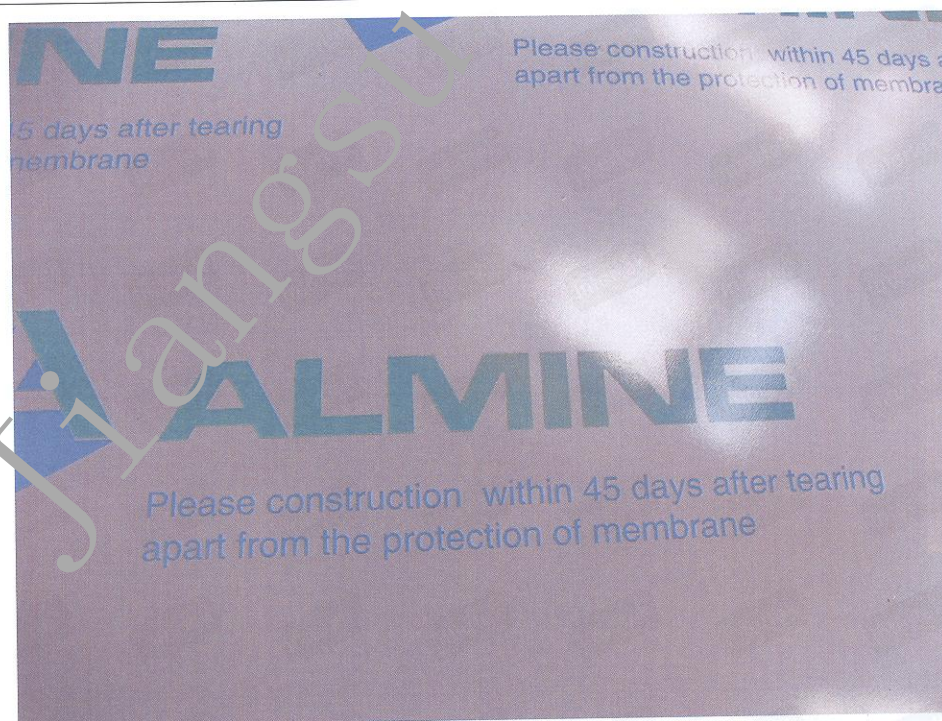
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Appendix A

Product photos



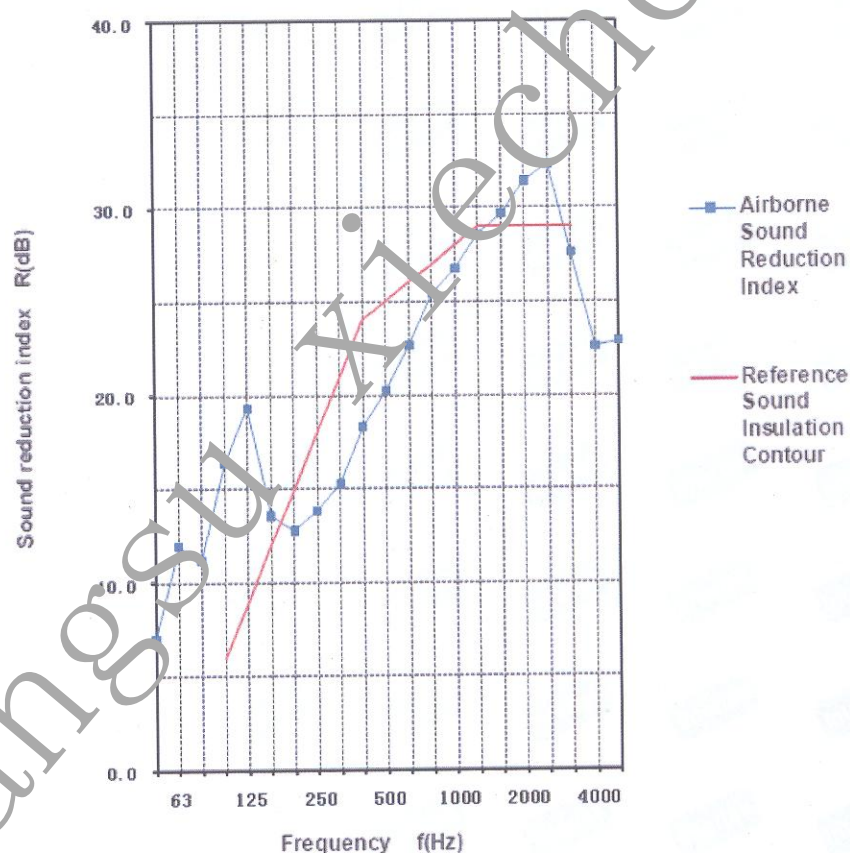
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Appendix B

Test Data of Airborne Sound Insulation

Area of the test specimen	10.08 m ² .
Sound source	Pink noise;
Testing instrument	Sound level meter B&K 2260
Source room volume	62 m ³
Receiving room volume	99 m ³
Air temperature in the test rooms	20 °C
Air humidity in the test rooms	42 %

Frequency, Hz	R, dB
50	7.0
63	11.9
80	11.2
100	16.4
125	19.3
160	13.5
200	12.8
250	13.8
315	15.2
400	18.3
500	20.2
630	22.6
800	25.4
1000	26.7
1250	28.5
1600	29.7
2000	31.4
2500	32.3
3150	27.6
4000	22.6
5000	22.9



The single-number rating R_w (dB)	$R_w(C, C_{tr}) = 25(-1, -4)$ dB
(C; C_{tr}) (dB)	(-1;-3)

*****End of Report*****