

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 1 of 8

CUSTOMER NAME:



Sample Name : Aluminum Composite Panel **B-bond**

Product Specification : 2mm

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

Date of Receipt : Feb 09, 2018

Testing Start Date : Feb 09, 2018

Testing End Date : Apr 10, 2018

Test result(s) : For further details, please refer to the following page(s)
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for
SGS-CSTC Standards Technical
Services Co., Ltd. GZ Branch Testing
Center

Salon

Salon Liu
Authorized signatory



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed at the end of the contract or available at <http://www.sgs.com/en/Terms-and-Conditions.aspx>, and for electronic formal documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the fact that the information contained herein reflects the Company's findings at the time of its intervention only and without prejudice to the Client's instructions, if any. The Company's sole responsibility is to the Client and this document does not exonerate it from its liability in relation to transactions from exercising all their rights and obligations.

The information contained in this document cannot be reproduced or stored in a retrieval system without the prior written permission of SGS.

This report relates only to the sample(s) listed below and such sample(s) will be held for 90 days only.

[191K; ,Road,Suid;IT[[]la,aool:ITCM<IDI] ... Gu,ngto;... 510663 1/J82155555 1/85->207050lll ... -Olpj.com.cn
[fili : [fil : IT[]la,aool:ITCM<IDI]#198 ... 510663 186-2082185666 1/86->10820750M ... sss.dian@Gse.com

Member of the SGS Group (SGS SA)

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 2 of 8

Test Result Summary

Test(s) Requested	Result(s)
EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements-Part 1: Classification using data from reaction to fire tests	Classification: C-s1, d0
Summary:	
1. For further details, please refer to the following page(s).	



SGS-CTI (Shanghai) Technical Services Co., Ltd.
Sungao Road, Yangpu District, Shanghai, China

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 6307 1443, or e-mail: CN.Doccheck@sgs.com

198 Kiezu Road, Sciencetech Park, Economic & Technical Development District, Guangzhou, China. 510663 t (86-20) 82155555 f (86-20) 82075080 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 3 of 8

TESTS AND RESULTS

Test Conducted:

This test is conducted as per EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements- Part 1: Classification using data from reaction to fire tests. And the test methods as following:

1. EN 13823:2010 Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.
2. EN ISO 11925-2:2010+AC:2011 Reaction to fire tests-Ignitability of building products subjected to direct impingement of flame-Part 2: Single-flame source test.

Mounting and fixing (For EN 13823):

The specimen was tested free standing at a distance of at least 80 mm from the backing board. Both wings were clamped at the top and the bottom.

Test Results:

Test method	Parameter	Number of tests	Results
EN 13823:2010+A1:2014	FIGRA _{0.4MJ} (W/s)	3	219.2
	THR _{600s} (MJ)		10.6
	SMOGRA (m ² /s ²)		3.2
	TSP _{600s} (m ²)		19.6
	LFS < edge of specimen		Yes
	Flaming particles or droplets		No
EN ISO 11925-2:2010+AC:2011 Exposure = 30 s	F _s ≤ 150 mm	6	Yes
	Ignition of the filter paper		No

Remark:

FIGRA-Fire growth rate index used for classification purposes [W/s]



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (+86-755) 8307 1443, or email: CN.Doccheck@sgs.com

198 Kazhu Road, Science Park, Economic & Technical Development District, Guangzhou, China. 510663 t (+86-20) 82155555 f (+86-20) 82075080 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (+86-20) 82155555 f (+86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 4 of 8

For the classes A2 and B, FIGRA_{0.2}MJ

For the classes C and D, FIGRA_{0.4}MJ

LFS-Lateral flame spread m

THR_{600s}-Total heat release within 600 s MJ

SMOGRA-Smoke growth rate [m²/s²]

TSP_{600s}-Total smoke production within 600 s m²

Classification and direct field of application:

This classification has been carried out in accordance with **EN 13501-1:2007+A1:2009**.

Classification:

Fire behaviour		Smoke production			Flaming droplets	
C	-	s	1	,	d	0

Remark:

The classes with their corresponding fire performance are given in annex A.

Reaction to fire classification is based on the 7-step scale of A1 to F, where A1 is good and F is bad

Statement:

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Warning:

This classification report does not represent type approval or certification of the product.

The test laboratory has, therefore, play no part in sampling the product for the test, although it holds appropriate references to the manufacturer's factory production control that is aimed to be relevant to the samples tested and that will provide for their traceability.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (+86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS CSTC (China) Testing Services Co., Ltd. 198 Kaifu Road, Science Park, Economic & Technical Development District, Guangzhou, China. 510663 t: (86-20) 82155555 f: (86-20) 82075080 www.sgs.com.cn
 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t: (86-20) 82155555 f: (86-20) 82075080 e: sgs.china@sgs.com

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 5 of 8

Table 1 — Classes of reaction to fire performance for construction products excluding floorings and linear pipe thermal insulation products.

Class	Test method(s)	Classification criteria	Additional classification
A1	EN ISO 1182 ^a and	$\Delta T \leq 30^{\circ}\text{C}$, and $\Delta m \leq 50\%$, and $t_f = 0$ (i.e. no sustained flaming)	-
	EN ISO 1716	$PCS \leq 2.0 \text{ MJ/kg}$ ^a and $PCS \leq 2.0 \text{ MJ/kg}$ ^{b c} and $PCS \leq 1.4 \text{ MJ/m}^2$ ^d and $PCS \leq 2.0 \text{ MJ/kg}$ ^e	-
A2	EN ISO 1182 ^a or	$\Delta T \leq 50^{\circ}\text{C}$, and $\Delta m \leq 50\%$, and $t_f \leq 20 \text{ s}$	-
	EN ISO 1716	$PCS \leq 3.0 \text{ MJ/kg}$ ^a and $PCS \leq 4.0 \text{ MJ/m}^2$ ^b and	-



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8397 1443, or email: CN.Doccheck@sgs.com

SGS-CSI (China) Inspection & Testing Services Co., Ltd.
Guangzhou Branch, 198 Kezhu Road, Science & Technology Development District, Guangzhou, China.

510663 t (86-20) 82155555 f (86-20) 82075080 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 6 of 8

			$PCS \leq 4.0 \text{ MJ/m}^2$ ^d and $PCS \leq 3.0 \text{ MJ/kg}$ ^e	
	EN 13823		$FIGRA \leq 120 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600s} \leq 7.5 \text{ MJ}$	Smoke production ^f and Flaming droplets/particles ^g
B	EN 13823	and	$FIGRA \leq 120 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600s} \leq 7.5 \text{ MJ}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 i		$F_s \leq 150 \text{ mm}$ within 60 s	
C	EN 13823	and	$FIGRA \leq 250 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600s} \leq 15 \text{ MJ}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 i		$F_s \leq 150 \text{ mm}$ within 60 s	
D	EN 13823	and	$FIGRA \leq 750 \text{ W/s}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 i		$F_s \leq 150 \text{ mm}$ within 60 s	
E	EN ISO 11925-2 i		$F_s \leq 150 \text{ mm}$ within 20 s	flaming droplets/particles ^h
F	No performance determined			

^a For homogeneous products and substantial components of non-homogeneous products.

^b For any external non-substantial component of non-homogeneous products.

^c Alternatively, any external non-substantial component having a $PCS \leq 2.0 \text{ MJ/m}^2$, provided that the product satisfies the following criteria of EN 13823: $FIGRA \leq 20 \text{ W/s}$, and $LFS < \text{edge of specimen}$, and $THR_{600s} \leq 4.0 \text{ MJ}$, and s_1 , and d_0 .

^d For any internal non-substantial component of non-homogeneous products.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only. Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (+86-755) 8307 1443, or email: CN.Descheck@sgs.com

198 Kazhu Road, Science Park, Economic & Technical Development District, Guangzhou, China. 510663 t (+86-20) 82155555 f (+86-20) 82075080 www.sgs.com.cn
 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (+86-20) 82155555 f (+86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 7 of 8

^e For the product as a whole.

^f In the last phase of the development of the test procedure, modifications of the smoke measurement system have been introduced, the effect of which needs further investigation. This may result in a modification of the limit values and/or parameters for the evaluation of the smoke production.

$s1 = \text{SMOGR} \leq 30 \text{ m}^2/\text{s}^2$ and $\text{TSP}_{600\text{s}} \leq 50 \text{ m}^2$; $s2 = \text{SMOGR} \leq 180 \text{ m}^2/\text{s}^2$ and $\text{TSP}_{600\text{s}} \leq 200 \text{ m}^2$; $s3 = \text{not } s1 \text{ or } s2$

^g $d0 = \text{No flaming droplets/ particles in EN 13823 within 600 s;}$

$d1 = \text{no flaming droplets/ particles persisting longer than 10 s in EN 13823 within 600 s;}$

$d2 = \text{not } d0 \text{ or } d1.$

Ignition of the paper in EN ISO 11925-2 results in a $d2$ classification.

^h Pass = no ignition of the paper (no classification);

Fail = ignition of the paper ($d2$ classification).

ⁱ Under conditions of surface flame attack and, if appropriate to the end-use application of the product, edge flame attack.

SAMPLE INFORMATION AND PICTURES

Thickness: About 2mm

Mass per unit area: About 3.31 kg/m^2



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic formal documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8367 1443, or email: CN.DocsCheck@sgs.com

SGS (China) Inspection & Testing Services Co., Ltd.
Guangzhou Branch: Guangzhou Science City Science City Road 198 No. 198

198 Kezhu Road, Science Park, Economic & Technical Development District, Guangzhou, China. 510663 t (86-20) 82155555 f (86-20) 82075080 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075080 e sgs.china@sgs.com

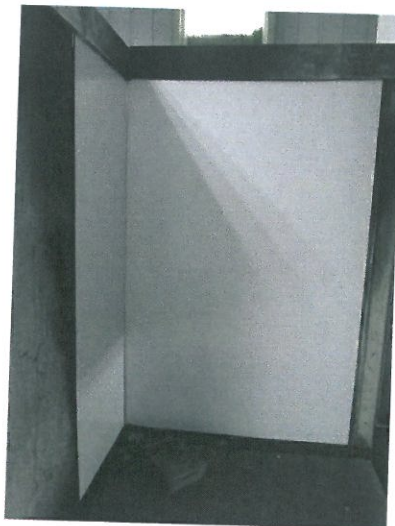
Member of the SGS Group (SGS SA)

TEST REPORT

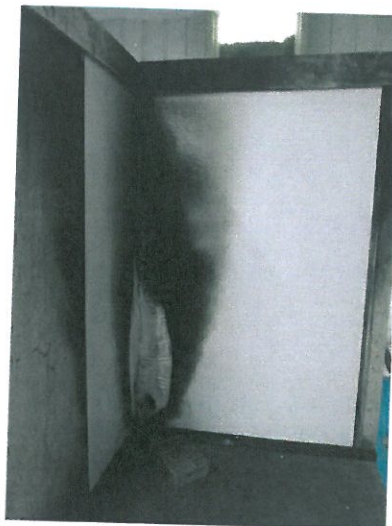
No. : GZIN1802007567CM

Date : Apr 10, 2018

Page: 8 of 8



Before Test (EN 13823)



After Test (EN 13823)

Note: The above test was carried out by SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch.

***** End of report *****



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated or results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Attention: To check the authenticity of testing : inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

198 Kazhu Road, Science Park, Economic & Technical Development District, Guangzhou, China. 510663 t (86-20) 82155555 f (86-20) 82075080 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075080 e sgs.china@sgs.com

Member of the SGS Group (SGS SA)