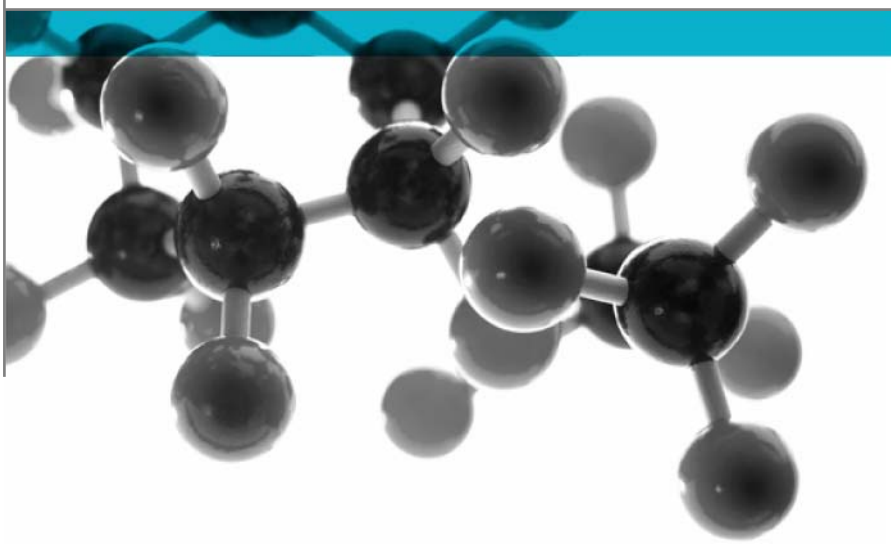
Exova Warringtonfire
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

T : +44 (0 1925 655116
F : +44 (0) 1925 655419
E : warrington@exova.com
W: www.exova.com

BS 476: Part 6: 1989+A1:2009



Method Of Test For
Fire Propagation For Products

A Report To: PPG Industries (UK) Limited

Document Reference: 194320

Date: 7th July 2010

Issue No.: 1

Testing
Advising
Assuring

UKAS TESTING
0249

Executive Summary

Objective To determine the performance of the following product when tested in accordance with BS 476: Part 6: 1989+A1: 2009.

Generic Description	Product reference	Thickness	Weight per unit area, density, or specific gravity
A five coat coating system applied to a 2mm thick aluminium substrate	"PPG2010009"	2.06mm*	5.57kg/m²*
Individual components used to manufacture composite:			
2-pack polyurethane finish"	"Selemix Direct 7-533 (1 775.3300)"	3 x 25 microns	1.6
1K adhesion promoter	"Nexa Autocolor P572-2001 1K Adhesion Primer"	2 x 3 microns	0.85
Aluminium substrate	"Aluminium 6082 T6"	2mm	2.70g/cm³
***Determined by Exova Warringtonfire**			
Please see page 5 of this test report for the full description of the product tested			

Test Sponsor PPG Industries (UK) Limited, Needham Road, Stowmarket, Suffolk, IP14 2AD

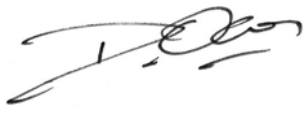
Test Results:

Fire propagation index, I	**=**	**0.0**
Sub index, i_1	**=**	**0.0**
Sub index, i_2	**=**	**0.0**
Sub index, i_3	**=**	**0.0**

Date of Test 22nd June 2010.

Signatories

Responsible Officer
I. White *
Testing Officer



Approved
D. J. Owen *
Senior Technical Officer

Authorised
C. Dean *
Operations Manager

* For and on behalf of **Exova Warringtonfire**.

Report Issued: 7th July 2010

CONTENTS **PAGE NO.**

Test Details

Purpose of test

To determine the performance of a product when it is subjected to the conditions of the test specified in BS 476: Part 6: 1989+A1: 2009, "Fire tests on building materials and structures, method for fire propagation for products".

The test was performed in accordance with the procedure specified in BS 476: Part 6: 1989+A1: 2009, and this report should be read in conjunction with that British Standard.

Scope of test

BS 476: Part 6: 1989+A1: 2009 specifies a method of test, the result being expressed as a fire propagation index, that provides a comparative measure of the contribution to the growth of fire made by an essentially flat material, composite or assembly. It is primarily intended for the assessment of the performance of internal wall and ceiling linings.

Fire test study group/EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.

Instruction to test

The test was conducted on the 22nd June 2010 at the request of PPG Industries (UK) Limited, the sponsor of the test.

Provision of test specimens

The specimens were supplied by the sponsor of the test. **Exova Warringtonfire** was not involved in any selection or sampling procedure.

Conditioning of specimens

The specimens for testing to BS 476: Part 6: 1989+A1: 2009 together with the specimens for testing to BS 476: Part 7: 1997 were received on the 15th June 2010.

Prior to the tests, all of the specimens were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 5%. One specimen from the total sample submitted for test was selected for constant mass verification.

Form in which the specimens were tested

Assembly - Fabrication of materials and/or composites that can contain air gaps. An air space was provided at the back of the product by testing over spacers of non-combustible insulation board 20 mm wide and 12.5mm thick.

Exposed face

The coated face of the specimens was exposed to the heating conditions of the test.

Description of Test Specimens

The description of the specimens given below has been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

General description		A five coat coating system applied to a 2mm thick aluminium substrate
Product reference of coating system		"PPG2010009"
Overall coating system thickness		Approx. 81 microns
Overall thickness of composite		2.06mm (determined by **Exova Warringtonfire**)
Overall weight per unit area of composite		5.57kg/m² (determined by **Exova Warringtonfire**)
Final coating product (Test face)	Generic type	2-pack polyurethane finish
	Product reference	"Selemix Direct 7-533 (1 775.3300)"
	Name of manufacturer	PPG Industries
	Colour	"White (RAL 9010)"
	Number of coats	3
	Application thickness per coat	25 microns per coat
	Application method	HVLP spray
	Specific gravity	1.6
	Flame retardant details	**See Note 1 below**
	Curing process per coat	1st coat – 10 mins flash off 2nd coat - 10 mins flash off + 30 mins at 60°C
First coating product	Generic type	1K adhesion promoter
	Product reference	"Nexa Autocolor P572-2001 1K Adhesion Primer"
	Name of manufacturer	PPG Industries
	Colour	Clear
	Number of coats	2
	Application thickness per coat	3 microns
	Application method	HVLP spray
	Specific gravity	0.85
	Flame retardant details	**See Note 1 below**
	Curing process per coat	1st coat – 10 mins flash off at RT 2nd coat - 10 mins flash off before recoating.
Substrate	Product reference	"Aluminium 6082 T6"
	Generic type	Aluminium
	Name of manufacturer	Pro-Test Panels Ltd.
	Thickness	2mm
	Density	2.70g/cm^3
	Flame retardant	The substrate is inherently flame retardant
	Preparation details	Machine sand with P240 paper and degrease with Nexa Autocolor P850-1378 Spirit Wipe
Brief description of manufacturing process of coatings		All paint systems manufactured by HSD / Beadmill process. All products used as per Product Data Sheet

Note 1. The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component

Test Results

Results

A total of three specimens were tested. The laboratory record sheet relating to each of the test specimens is appended to this report (refer to Tables 1, 2 and 3).

Throughout the test on each specimen careful observation was made of the product's behaviour within the apparatus and special note was taken of any of the phenomena listed in clause 9.2 of the Standard. None of the listed phenomena was observed and the test results on all three specimens tested were valid.

The following test results were obtained for the product.

Fire propagation index, I	**=**	**0.0**
Sub index, i_1	**=**	**0.0**
Sub index, i_2	**=**	**0.0**
Sub index, i_3	**=**	**0.0**

NOTE: If a suffix 'R' is included in the above fire propagation index, I, then this indicates that the results should be treated with caution.

Applicability of test result

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

The test results relate only to the specimens of the product in the form in which they were tested. Small differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product which is supplied or used is fully represented by the specimens which were tested.

Validity

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Table 1

Laboratory Record Sheet

FIRE PROPAGATION TEST - BS 476:PART 6:1989+A1:2009

Specimen No. : 1 **Date : 22-Jun-10**

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts-Tc/10t	Sub Index Of Performance
0.50	**11**	**13**	**0.00**	
1.00	**16**	**18**	**0.00**	
1.50	**19**	**22**	**0.00**	
2.00	**23**	**25**	**0.00**	
2.50	**25**	**29**	**0.00**	
3.00	**29**	**32**	**0.00**	**0.00**
4.00	**62**	**65**	**0.00**	
5.00	**95**	**102**	**0.00**	
6.00	**122**	**128**	**0.00**	
7.00	**147**	**148**	**0.00**	
8.00	**164**	**165**	**0.00**	
9.00	**178**	**180**	**0.00**	
10.00	**189**	**192**	**0.00**	**0.00**
12.00	**203**	**207**	**0.00**	
14.00	**213**	**216**	**0.00**	
16.00	**220**	**226**	**0.00**	
18.00	**226**	**233**	**0.00**	
20.00	**232**	**239**	**0.00**	**0.00**
Total Index of Performance S			**=**	**0.00**

SubIndex s1 **0.00**

SubIndex s2 **0.00**

SubIndex s3 **0.00**

Index of Performance S **0.00**

Table 2

Laboratory Record Sheet

FIRE PROPAGATION TEST - BS 476:PART 6:1989+A1:2009

Specimen No. : 2 **Date : 22-Jun-10**

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts-Tc/10t	Sub Index Of Performance
0.50	13	13	0.00	
1.00	18	18	0.00	
1.50	21	22	0.00	
2.00	25	25	0.00	
2.50	29	29	0.00	
3.00	32	32	0.00	0.00
4.00	62	65	0.00	
5.00	96	102	0.00	
6.00	123	128	0.00	
7.00	146	148	0.00	
8.00	163	165	0.00	
9.00	177	180	0.00	
10.00	187	192	0.00	0.00
12.00	201	207	0.00	
14.00	212	216	0.00	
16.00	220	226	0.00	
18.00	226	233	0.00	
20.00	233	239	0.00	0.00
Total Index of Performance S			**=**	**0.00**

SubIndex s1 **0.00**

SubIndex s2 **0.00**

SubIndex s3 **0.00**

Index of Performance S **0.00**

Table 3

Laboratory Record Sheet

FIRE PROPAGATION TEST - BS 476:PART 6:1989+A1:2009

Specimen No. : 3 **Date : 22-Jun-10**

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts-Tc/10t	Sub Index Of Performance
0.50	12	14	0.00	
1.00	16	20	0.00	
1.50	20	25	0.00	
2.00	23	29	0.00	
2.50	25	33	0.00	
3.00	29	38	0.00	0.00
4.00	58	69	0.00	
5.00	94	106	0.00	
6.00	121	133	0.00	
7.00	142	153	0.00	
8.00	159	169	0.00	
9.00	174	182	0.00	
10.00	187	192	0.00	0.00
12.00	202	208	0.00	
14.00	215	219	0.00	
16.00	222	228	0.00	
18.00	230	234	0.00	
20.00	234	239	0.00	0.00
Total Index of Performance S			=	0.00

SubIndex s1 **0.00**

SubIndex s2 **0.00**

SubIndex s3 **0.00**

Index of Performance S **0.00**

Revision History

Issue No :	Issue Date:
Revised By:	Approved By:
Reason for Revision:	

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