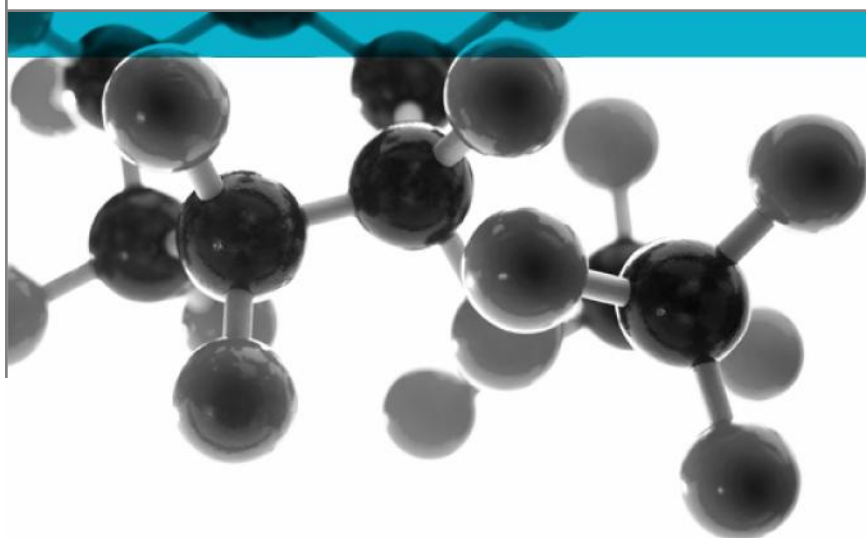


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BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: International Aluminium Company s.r.l.

Document Reference: 338764

Date: 22nd May 2014

Issue No.: 1

Page 1

Testing
Advising
Assuring



Executive Summary

Objective To determine the surface spread of flame classification of the following product when tested in accordance with BS 476: Part 7: 1997.



Generic Description	Product reference	Thickness	Weight per unit area / density specific gravity
A coating system applied to an aluminium substrate	"D-MAX® HIGH PERFORMANCE SOLID ALUMINUM"	3.0 mm	2.71 g/cm ³
Individual components used to manufacture composite:			
Final coating product (test face)	"WHITE RAL 9016 VL 403"	20±2 microns	Unwilling to provide
First coating product	"WHITE VL75"	5±2 microns	Unwilling to provide
Substrate	"5754 ALLOY"	3 mm	2.71 g/cm ³
Coating product (reverse face)	"GREY RAL 7035 VL232"	5±2 microns	Unwilling to provide
Please see page 5 of this test report for the full description of the product tested			

Test Sponsor International Aluminium Company s.r.l., Via Pergolesi, 6 – 20124 Milano mi, Italy.

Test Results: **Class 1**

Date of Test 26th March 2014

Signatories

	
Responsible Officer C. Meachin * Technical Officer	Authorised S. Deeming * Operations Manager

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

Report Issued: 22nd May 2014

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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 7: 1997, "Fire tests on building materials and structures, method for classification of the surface spread of flame of products". This test was therefore performed in accordance with the procedure specified in BS 476: Part 7: 1997 and this report should be read in conjunction with that British Standard.
Scope of test	BS 476: Part 7: 1997 specifies a method of test for measuring the lateral spread of flame along the surface of a specimen of a product orientated in the vertical position, and a classification system based on the rate and extent of flame spread. It provides data suitable for comparing the performances of essentially flat materials, composites, or assemblies, which are used primarily as the exposed surfaces of walls or ceilings.
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 26 th March 2014 at the request of International Aluminium Company s.r.l., 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	<p>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 10th March 2014.</p> <p>Prior to the tests, all of the specimens were conditioned to constant mass at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$. One specimen from the total sample submitted for test was selected for constant mass verification.</p>
Form in which the specimens were tested	Composite - Combination of materials which are generally recognised in building constructions as discrete entities e.g. coated or laminated materials. Each specimen was tested in direct contact with a nominally 12mm thick non-combustible backing board.
Exposed face	The PVDF coated face of the specimens was exposed to the heating conditions of the test.

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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 coating system applied to an aluminium substrate
Product reference of composite		"D-MAX® HIGH PERFORMANCE SOLID ALUMINIUM"
Name of manufacturer of composite		INTERNATIONAL ALLUMINIUM COMPANY SRL
Thickness of composite		3.0 mm (stated by sponsor) 3.0 mm (determined by Exova Warringtonfire)
Density of composite		2.71 g/cm ³ (stated by sponsor) 2.62 g/cm ³ (determined by Exova Warringtonfire)
Final coating product (Test face)	Generic type	Polyvinylidene difluoride (PVDF) liquid paint
	Product reference	"WHITE RAL 9016 VL 403"
	Name of manufacturer	See Note 1 below
	Colour reference	See Note 1 below
		"White" (observed by Exova Warringtonfire)
	Number of coats	1
	Application thickness per coat	20±2 microns
	Density / specific gravity	See Note 1 below
	Application method	Coil coating
	Flame retardant details	See Note 2 below
Curing process per coat	Infra-red system	
First coating product	Generic type	Polyester liquid paint
	Product reference	"WHITE VL75"
	Name of manufacturer	See Note 1 below
	Colour reference	See Note 1 below
	Number of coats	1
	Application thickness per coat	5±2 microns
	Density / specific gravity	See Note 1 below
	Application method	Coil coating
	Flame retardant details	See Note 2 below
Curing process per coat	Infra-red system	
Substrate	Generic type	Aluminium alloy
	Product reference	"5754 ALLOY"
	Detailed description / composition details	EN AW 5754 / EN AW-AI Mg3
	Name of manufacturer	See Note 1 below
	Thickness	3 mm
	Density	2.71 g/cm ³
	Flame retardant details	This component is inherently flame retardant

Continued on next page

Coating product (Reverse face)	Generic type	Epoxide liquid paint
	Product reference	"GREY RAL 7035 VL232"
	Name of manufacturer	See Note 1 below
	Colour reference	See Note 1 below
	Number of coats	1
	Application thickness per coat	5±2 microns
	Density / specific gravity	See Note 1 below
	Application method	Coil coating
	Flame retardant details	See Note 2 below
	Curing process per coat	Infra-red system
Brief description of manufacturing process		Unwinding coil Jointing with preceding coil Chemical pre-treatment Painting (primer on face a & back on face b) Paint polymerization Painting (finish on face a) Paint polymerization Cooling Application of protective film Rewinding coil

Note 1 - The sponsor was unwilling to provide this information.

Note 2 - The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

Test Results

Results and observations The test results for the individual specimens, together with observations made during the test and comments on any difficulties encountered during the test are given in Appendix 1.

Classification **In accordance with the class definitions given in BS 476: Part 7: 1997; the specimens tested are classified as Class 1.**

Criteria for classification If the prefix 'D' or suffix 'R' or 'Y' is included in the classification, this indicates that the results should be treated with caution. An explanation of the reason for the prefix and suffixes is given in Appendix 2, together with the classification limits specified in the Standard.

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.

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Appendix 1 – Test Results

SPECIMEN No.	1	2	3	4	5	6
Maximum distance travelled at 1.5 minutes (mm)	<50	<50	<50	<50	<50	<50
Distance (mm)	Time to travel to indicated distance (minutes : seconds)					
75						
165						
190						
215						
240						
265						
290						
375						
455						
500						
525						
600						
675						
710						
750						
785						
825						
Time to reach maximum distance travelled	1:00	1:00	1:00	1:00	1:00	1:00
Maximum distance travelled in 10 minutes (mm)	<50	<50	<50	<50	<50	<50

Note: Six specimens are usually tested. If the test on any specimen is deemed to be invalid, as defined in the Standard, it is permissible for up to a maximum of nine specimens to be tested in order to obtain the six valid test results.

Observations made during test and comments on any difficulties encountered during the test:

None.

Appendix 2 – Classification criteria

Classification of spread of flame	Spread of Flame at 1.5 min		Final Spread of Flame	
	Limit (mm)	Limit for one specimen (mm)	Limit (mm)	Limit for one specimen (mm)
Class 1	165	165 + 25	165	165 + 25
Class 2	215	215 + 25	455	455 + 45
Class 3	265	265 + 25	710	710 + 75

Class 4 Exceeding the limits for class 3

Explanation of prefix and suffixes which may be added to the classification

1. A suffix R is added to the classification if more than six specimens are required in order to obtain six valid test results (e.g. class 2R).
2. A prefix D is added to the classification of any product which does not comply with the surface characteristics specified in the Standard and has therefore been tested in a modified form (e.g. class D3).
3. A suffix Y is added to the classification if any softening and/or other behaviour that may affect the flame spread occurs (e.g. class 3Y).

For example, a classification of D3RY could be achieved indicating (a) a modified surface has been used; (b) a class 3 result has been obtained; (c) additional specimens have been used to obtain 6 valid results and; (d) softening and/or other behaviour has occurred which is considered to have affected the test result.

Revision History

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