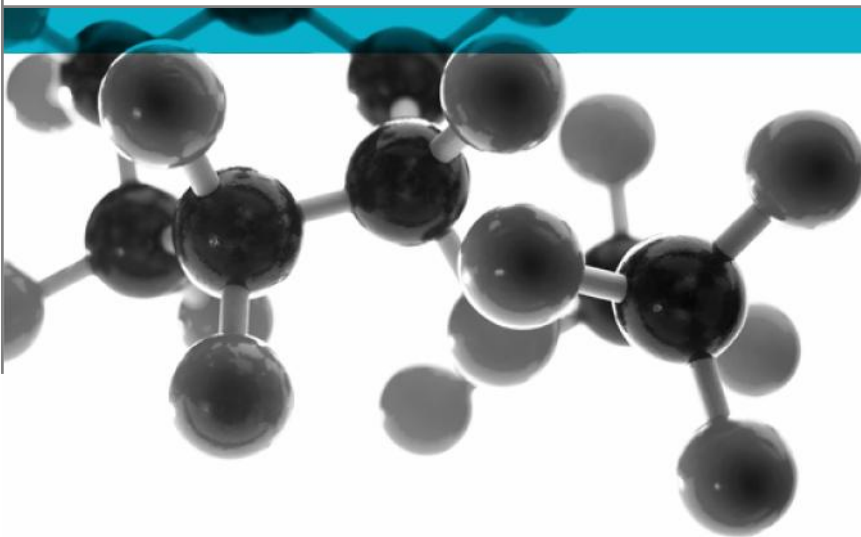


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BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Huntsman (Belgium) BVBA

Document Reference: 324414

Date: 30th January 2013

Issue No.: 2

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 or density
Polyurethane (PU) Insulated Foam Panels	Unwilling to provide	50mm	23.5kg/m ² *
Individual components used to manufacture composite:			
Foam (test face)	"Daltotherm TSW 38-01"	25-30mm	40kg/m ³
Substrate	"Eterspan Concrete Boards 22mm"	22mm	5.4kg/m ²
*determined by Exova Warringtonfire			
Please see page 5 of this test report for the full description of the product tested			

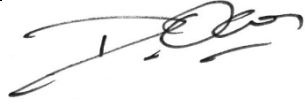

Test Sponsor Huntsman (Belgium) BVBA, Everslaan 45, B-3078 Everberg, Belgium

Test Results: **Class 1**

Date of Test 5th December 2012

Reason for revision This document replaces issue 1 (dated 19th December 2012) of the same number which has been withdrawn. The sponsor of the test was unable to provide the product reference details of the foam (test face) on page 2 and 5 in the issue 1 report. They have been provided in this issue 2 report.

Signatories

	
Responsible Officer D J Owen* Senior Technical Officer	Authorised T Mort* Senior Technical Officer

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

Report Issued: 30th January 2013

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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 5 th December 2012 at the request of Huntsman (Belgium) BVBA, 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 were received on the 28 th November 2012 and were conditioned to constant mass at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$ prior to testing.
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 foam 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		Polyurethane (PU) Insulated Foam Panels
Product reference of composite		See Note 1 below
Name of manufacturer of composite		Huntsman Belgium
Thickness of composite		50mm (stated by sponsor) 43.88mm (determined by Exova Warringtonfire)
Weight per unit area of composite		23.5kg/m ² (determined by Exova Warringtonfire)
Foam (test face)	Generic type	A fire retardant polyurethane foam (spray applied)
	Product reference	"Daltotherm TSW 38-01"
	Name of manufacturer	Huntsman Belgium
	Thickness	25 – 30mm
	Density	40kg/m ³
	Colour reference	"Yellow"
	Flame retardant details	See Note 1 below
Substrate	Generic type	Concrete boards
	Product reference	"Eterspan Concrete Boards 22mm"
	Name of manufacturer	Eternit
	Thickness	22mm
	Weight per unit area	5.4kg/m ²
	Colour reference	"Grey"
Flame retardant details	See Note 2 below	
Brief description of manufacturing process		The insulation foam was sprayed on the panels in 2 layers.

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

Note 2 - The sponsor was unable to provide this information.

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)	85	85	80	100	80	85
Distance (mm)	Time to travel to indicated distance (minutes : seconds)					
75	0:07	0:08	0:07	0:08	0:08	0:07
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)	85	85	80	100	80	85

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:

In the case of each specimen, transitory flaming occurred above the reference line reaching upto a maximum distance of 130mm by 3:48.

In the case of specimen No.s 1, 2 and 3, sustained flaming occurred along the top edge of the specimens reaching upto a maximum distance of 265mm, 240mm and 230mm by 4:30, 2:52 and 3:48 respectively.

Appendix 2 – Classification Criteria

Classification of spread of flame	Spread of Flame at 1.5 min		Final Spread of Flame		
	Classification	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

Issue No : 1	Re-issue Date: 30 th January 2013
Revised By: D. J. Owen	Approved By: T. Mort
Reason for Revision: This document replaces issue 1 (dated 19 th December 2012) of the same number which has been withdrawn. The sponsor of the test was unable to provide the product reference details of the foam (test face) on page 2 and 5 in the issue 1 report. They have been provided in this issue 2 report.	

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