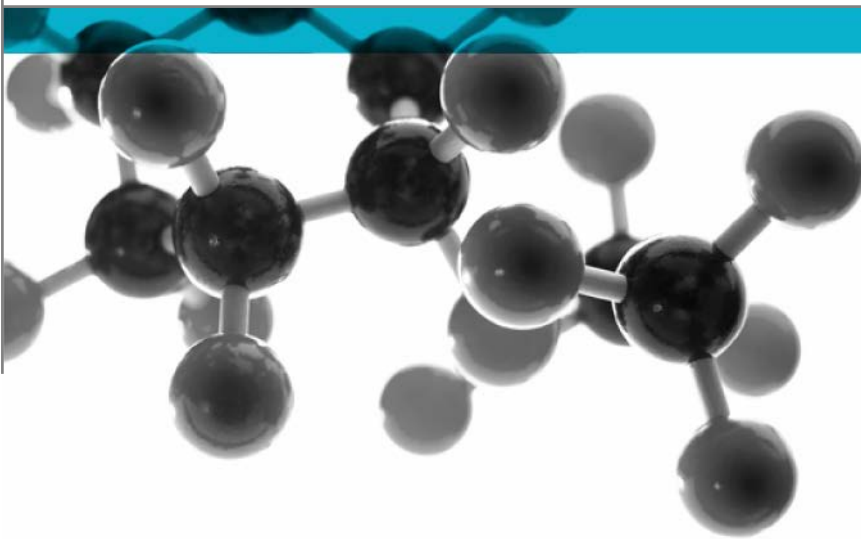


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# BS 476: Part 6: 1989+A1:2009



## Method Of Test For Fire Propagation For Products

A Report To: GMS Insulations Ltd.

Document Reference: 347749

Date: 23<sup>rd</sup> December 2014

Issue No.: 1

Page 1

Testing  
Advising  
Assuring



## 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	Density
Coated spray foam insulation	"Icynene Classic Plus/DC 315"	52mm *	1.55kg/m <sup>2</sup> *
<b>Individual components used to manufacture composite:</b>			
Water based fireproof paint	"DC 315"	20 mils (0.51mm)	20 kg/m <sup>3</sup>
Spray foam insulation	"Icynene Classic Plus"	50mm	12kg/m <sup>3</sup>
* determined by <b>Exova Warringtonfire</b>			
<b>Please see page 5 of this test report for the full description of the product tested</b>			


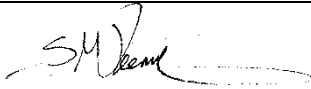
**Test Sponsor** GMS Insulations Ltd., Legga, Moyne, Co Longford 119, Ireland.

**Test Results:**

<b>Fire propagation index, I</b>	=	<b>8.5</b>
<b>Sub index, i<sub>1</sub></b>	=	<b>5.0</b>
<b>Sub index, i<sub>2</sub></b>	=	<b>2.9</b>
<b>Sub index, i<sub>3</sub></b>	=	<b>0.6</b>

**Date of Test** 17<sup>th</sup> December 2014

## Signatories

	
Responsible Officer I. White* Testing Officer	Authorised S. Deeming * Operations Manager

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

Report Issued: 23<sup>rd</sup> December 2014

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## Test Details

<b>Purpose of test</b>	<p>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".</p> <p>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.</p>
<b>Scope of test</b>	<p>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.</p>
<b>Fire test study group/EGOLF</b>	<p>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.</p>
<b>Instruction to test</b>	<p>The test was conducted on the 17<sup>th</sup> December 2014 at the request of GMS Insulations Ltd., the sponsor of the test.</p>
<b>Provision of test specimens</b>	<p>The specimens were supplied by the sponsor of the test. <b>Exova Warringtonfire</b> was not involved in any selection or sampling procedure.</p>
<b>Conditioning of specimens</b>	<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 15<sup>th</sup> December 2014.</p> <p>Prior to the tests, all of the specimens were conditioned to constant mass at a temperature of <math>23 \pm 2^{\circ}\text{C}</math> and a relative humidity of <math>50 \pm 5\%</math>. One specimen from the total sample submitted for test was selected for constant mass verification.</p>
<b>Form in which the specimens were tested</b>	<p>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.</p>
<b>Exposed face</b>	<p>The coated face of the specimens was exposed to the heating conditions of the test.</p>

## 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		Coated spray foam insulation
Product reference of composite		"Icynene Classic Plus/DC 315"
Name of manufacturer of composite		Icynene Inc. & International Fireproof Technology Inc.
Thickness of composite		52.7mm (determined by <b>Exova Warringtonfire</b> )
Weight per unit area of composite		1.55kg/m <sup>2</sup> (determined by <b>Exova Warringtonfire</b> )
Coating (test face)	Generic type	Water based fireproof paint
	Product reference	"DC 315"
	Name of manufacturer	International Fireproof Technology Inc.
	Colour reference	"White"
	Number of coats	One
	Application thickness per coat	20 mils (0.51 mm)
	Density	20 kg/m <sup>3</sup>
	Application method	Airless sprayer, brush or roller
	Flame retardant details	<b>See Note 1 below</b>
	Curing process per coat	8 hours
Insulation	Generic type	Spray foam insulation
	Product reference	"Icynene Classic Plus"
	Detailed description details	Open cell, water blown low density foam
	Name of manufacturer	Icynene Inc.
	Thickness	50mm
	Density	12kg/m <sup>3</sup>
	Colour reference	"Off White"
Flame retardant details	<b>See Note 2 below</b>	
Brief description of manufacturing process		The foam is a site applied product which is a two component product that is mixed under temperature and pressure to form a spray foam insulation

**Note 1: The sponsor was unable 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

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.**

<b>Fire propagation index, I</b>	<b>=</b>	<b>8.5</b>
<b>Sub index, <math>i_1</math></b>	<b>=</b>	<b>5.0</b>
<b>Sub index, <math>i_2</math></b>	<b>=</b>	<b>2.9</b>
<b>Sub index, <math>i_3</math></b>	<b>=</b>	<b>0.6</b>

**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.

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Table 1

Laboratory Record Sheet
**FIRE PROPAGATION TEST - BS476:PART 6:1989+A1:2009**

Specimen No. : 1

Date : 17-Dec-14

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts- Tc/10t	Sub Index Of Performance
0.50	18	12	1.20	5.28
1.00	25	16	0.90	
1.50	34	21	0.87	
2.00	42	25	0.85	3.52
2.50	49	29	0.80	
3.00	54	34	0.67	
4.00	94	69	0.63	0.67
5.00	138	106	0.64	
6.00	171	131	0.67	
7.00	190	152	0.54	9.47
8.00	201	170	0.39	
9.00	217	186	0.34	
10.00	225	194	0.31	0.67
12.00	238	214	0.20	
14.00	247	225	0.16	
16.00	257	233	0.15	0.67
18.00	258	242	0.09	
20.00	263	248	0.08	
<b>Total Index of Performance S</b>			<b>=</b>	<b>9.47</b>

SubIndex s1                      5.28

SubIndex s2                      3.52

SubIndex s3                      0.67

Index of Performance S        9.47

Table 2

Laboratory Record Sheet
**FIRE PROPAGATION TEST - BS476:PART 6:1989+A1:2009**

Specimen No. : 2

Date : 17-Dec-14

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts- Tc/10t	Sub Index Of Performance
0.50	19	12	1.40	
1.00	26	16	1.00	
1.50	33	21	0.80	
2.00	40	25	0.75	
2.50	45	29	0.64	
3.00	52	34	0.60	5.19
4.00	89	69	0.50	
5.00	130	106	0.48	
6.00	160	131	0.48	
7.00	188	152	0.51	
8.00	201	170	0.39	
9.00	211	186	0.28	
10.00	221	194	0.27	2.91
12.00	238	214	0.20	
14.00	249	225	0.17	
16.00	254	233	0.13	
18.00	260	242	0.10	
20.00	265	248	0.09	0.69
<b>Total Index of Performance S</b>			<b>=</b>	<b>8.79</b>

SubIndex s1                      5.19

SubIndex s2                      2.91

SubIndex s3                      0.69

Index of Performance S        8.79



Table 3

Laboratory Record Sheet
**FIRE PROPAGATION TEST - BS476:PART 6:1989+A1:2009**

Specimen No. : 3

Date : 17-Dec-14

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts- Tc/10t	Sub Index Of Performance
0.50	18	12	1.20	4.48
1.00	26	16	1.00	
1.50	33	21	0.80	
2.00	37	25	0.60	2.09
2.50	41	29	0.48	
3.00	46	34	0.40	
4.00	83	69	0.35	0.56
5.00	127	106	0.42	
6.00	155	131	0.40	
7.00	172	152	0.29	7.13
8.00	188	170	0.23	
9.00	202	186	0.18	
10.00	217	194	0.23	0.56
12.00	232	214	0.15	
14.00	245	225	0.14	
16.00	255	233	0.14	0.56
18.00	256	242	0.08	
20.00	259	248	0.06	
<b>Total Index of Performance S</b>			<b>=</b>	<b>7.13</b>

SubIndex s1                      4.48

SubIndex s2                      2.09

SubIndex s3                      0.56

Index of Performance S        7.13

## Revision History

Issue No :	Re-issue Date:
Revised By:	Approved By:
Reason for Revision:	

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Revised By:	Approved By:
Reason for Revision:	