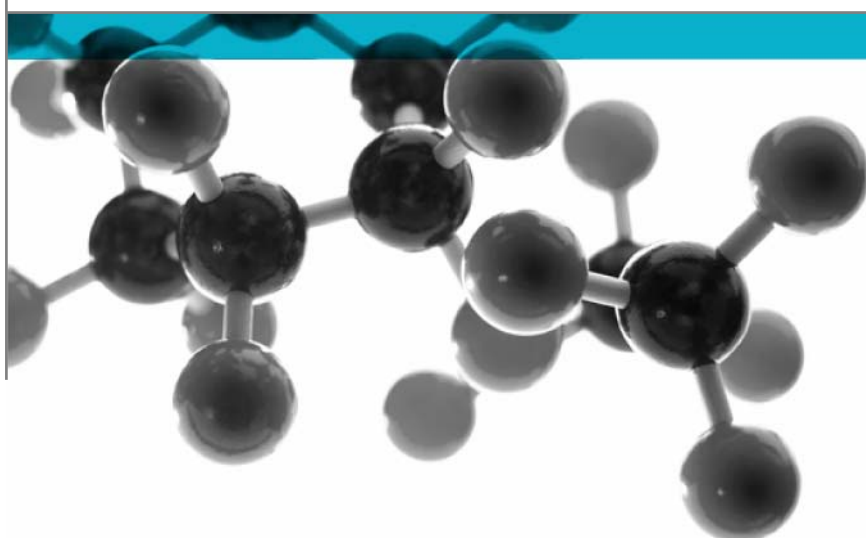


Exova Warringtonfire
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

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



BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Contra Vision

Document Reference: 334871

Date: 28th November 2013

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 / application rate	Weight per unit area or density
Self-adhesive perforated window film adhered to toughened glass substrate	"Contra Vision [®] Performance [™] "	6.16mm *	14.8kg/m ² *
Individual components used to manufacture composite:			
Ply No.1 film (test face)	"Polymeric Calendered PVC"	90 microns	75g/m ²
Ply No.2 film	"Polymeric Calendered PVC"	90 microns	75g/m ²
Adhesive	Unable to provide	28g/m ²	Not stated
Substrate	"6mm Toughened"	6mm	14.61kg/m ² *
*Determined by Exova Warringtonfire			
Please see page 5 of this test report for the full description of the product tested			

Test Sponsor Contra Vision, Victoria House, 19-21 Ack Lane East, Bramhall, Stockport, Cheshire, SK7 2BE

Test Results: **Class 1**

Date of Test 21st & 22nd November 2013

Signatories

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

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

Report Issued: 28th November 2013

This version of the report has been produced from a pdf format electronic file that has been provided by Exova Warringtonfire to the sponsor of the report and must only be reproduced in full Extracts or abridgements of reports must not be published without permission of Exova Warringtonfire

CONTENTS	PAGE NO.
EXECUTIVE SUMMARY	2
SIGNATORIES.....	2
TEST DETAILS.....	4
DESCRIPTION OF TEST SPECIMENS.....	5
TEST RESULTS	6
APPENDIX 1 – TEST RESULTS	7
APPENDIX 2 – CLASSIFICATION CRITERIA	8
REVISION HISTORY	9



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 21 st & 22 nd November 2013 at the request of Contra Vision, the sponsor of the test.
Provision of test specimens	The specimens were supplied by the sponsor of the test. Exova Warringtonfire supplied the substrate and bonded the composite together. 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 18th November 2013</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	Assembly - Fabrication of materials and/or composites that can contain air gaps. Each specimen was placed over 25mm thick by 20mm wide calcium silicate based spacers positioned around its perimeter and mounted onto a backing board so that a 25mm enclosed air gap was provided between the unexposed face of the specimen and the backing board.
Exposed face	The white film 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		Self-adhesive perforated window film adhered to toughened glass substrate
Trade name		"Contra Vision [®] Performance [™] "
Thickness of film		180 microns
Weight per unit area of film inclusive of adhesive		170g/m ²
Thickness of composite		6.16mm (determined by Exova Warringtonfire)
Weight per unit area of composite		14.8kg/m ² (determined by Exova Warringtonfire)
Name of manufacturer		Contra Vision Supplies Ltd
Perforations	Diameter of holes	1.60mm
	Spacing between hole centres	2.40mm
Ply No.1 film (test face)	Generic type	Polyvinyl chloride (PVC)
	Product reference	"Polymeric Calendered PVC"
	Name of manufacturer	Renolit
	Colour	"White"
	Thickness	90 microns
	Weight per unit area	75g/m ²
	Flame retardant details	See Note 1 below
Ply No.2 film	Generic type	PVC
	Product reference	"Polymeric Calendered PVC"
	Name of manufacturer	Renolit
	Colour	"Black"
	Thickness	90 microns
	Weight per unit area	75g/m ²
	Flame retardant details	See Note 1 below
Adhesive	Generic type	Solvent acrylic
	Product reference	See Note 1 below
	Name of manufacturer	See Note 2 below
	Application rate	28g/m ²
	Application method	Transferred from coated release liner
	Flame retardant details	See Note 1 below
Substrate	Generic type	Toughened glass
	Product reference	"6mm Toughened"
	Name of supplier	KLG Glass (Chiwell)
	Colour reference	"Clear"
	Thickness	6mm
	Weight per unit area	14.61kg/m ² (determined by Exova Warringtonfire)
	Flame retardant details	The substrate is inherently flame retardant
Brief description of manufacturing process		White and black layers (ply 1 and ply 2) of calendered PVC, laminated together with heat & pressure, adhesive coated and then perforated.

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

Note 2 - The sponsor was unwilling 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.

This report may only be reproduced in full. Extracts or abridgements shall not be published without permission of **Exova Warringtonfire**.

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:

In the case of each specimen tested all sustained flaming ceased after 1:00. The specimen cracked and shattered during the third minute of the test causing a hole to form across the surface. It was considered this behaviour would not affect the spread flame and so a Y suffix has not been added to the classification.

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)
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 :	Re-issue Date:
Revised By:	Approved By:
Reason for Revision:	

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