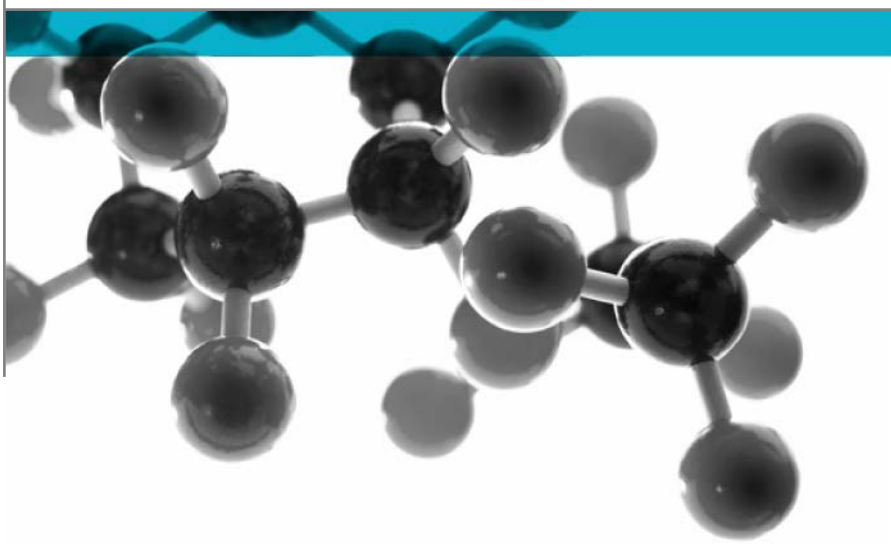
Exova Warringtonfire
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

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: L'Isolante K-Flex S.p.A.

Document Reference: 363376

Date: 29th April 2016

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 / application rate	Weight per unit area or density
A thermal insulation product comprising a rubber foil adhered to a steel substrate	"K-Flex IN CLAD"	2.2mm *	9.55kg/m^2 *
Individual components used to manufacture composite:			
Facing	"K-Flex IN CLAD"	1mm	1.6kg/m^2
Adhesive	"Loctite Super Glue"	Unwilling to provide	Not stated
Substrate	Unwilling to provide	1mm	14.80kg/m^2
***Determined by Exova Warringtonfire**			
Please see page 5 of this test report for the full description of the product tested			

Test Sponsor L'Isolante K-Flex S.p.A., Via Leonardo da Vinci 36, 20877, Roncello (MB), Italy.

Test Results:

Fire propagation index, I	**=**	**6.2**
Sub index, i_1	**=**	**1.1**
Sub index, i_2	**=**	**3.9**
Sub index, i_3	**=**	**1.2**

Date of Test 6th April 2016

Signatories

Responsible Officer C. Meachin * Technical Officer	Authorised S. Deeming * Business Unit Head

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

Report Issued: 29th April 2016

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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 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 6th April 2016 at the request of L'Isolante K-Flex S.p.A., 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 30th March 2016 and were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 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.

Exposed face

The rubber foil 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 thermal insulation product comprising a rubber foil adhered to a steel substrate
Product reference		"K-Flex IN CLAD"
Name of manufacturer		L'Isolante K-Flex SpA Via Leonardo da Vinci, 36 20877 Roncello (MB) Italy
Thickness		2.2mm (determined by **Exova Warringtonfire**)
Weight per unit area		9.55kg/m^2 (determined by **Exova Warringtonfire**)
Facing	Generic type	Polymeric based rubber foil
	Product reference	"K-Flex IN CLAD"
	Detailed description	**See Note 1 Below**
	Name of manufacturer	L'Isolante K-Flex SpA
	Thickness	1mm
	Density	1.6kg/m^3
	Colour reference	"Grey"
	Flame retardant details	**See Note 1 Below**
Adhesive	Generic type	Cyanoacrylate
	Product reference	"Loctite Super Glue"
	Name of manufacturer	Loctite
	Application rate	**See Note 1 Below**
	Application method	Brush
	Flame retardant details	**See Note 2 below**
	Curing process	**See Note 1 Below**
Substrate	Generic type	Steel
	Product reference	**See Note 1 Below**
	Name of manufacturer	Carpenterie Sala
	Thickness	1mm
	Weight per unit area	14.80kg/m^2
	Colour reference	"Silver"
	Flame retardant details	The component is inherently flame retardant
Brief description of manufacturing process		**See Note 1 Below**

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

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	**=**	**6.2**
Sub index, i_1	**=**	**1.1**
Sub index, i_2	**=**	**3.9**
Sub index, i_3	**=**	**1.2**

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 - BS476:PART 6:1989+A1:2009

Specimen No. : 1 **Date : 6-Apr-16**

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts- Tc/10t	Sub Index Of Performance
0.50	**12**	**13**	**0.00**	
1.00	**20**	**19**	**0.10**	
1.50	**27**	**24**	**0.20**	
2.00	**34**	**28**	**0.30**	
2.50	**40**	**33**	**0.28**	
3.00	**45**	**37**	**0.27**	**1.15**
4.00	**79**	**72**	**0.18**	
5.00	**126**	**110**	**0.32**	
6.00	**161**	**140**	**0.35**	
7.00	**202**	**163**	**0.56**	
8.00	**223**	**179**	**0.55**	
9.00	**244**	**194**	**0.56**	
10.00	**265**	**204**	**0.61**	**3.12**
12.00	**278**	**221**	**0.48**	
14.00	**282**	**229**	**0.38**	
16.00	**265**	**237**	**0.18**	
18.00	**255**	**242**	**0.07**	
20.00	**253**	**249**	**0.02**	**1.12**
Total Index of Performance S			**=**	**5.39**

SubIndex s1 **1.15**

SubIndex s2 **3.12**

SubIndex s3 **1.12**

Index of Performance S **5.39**

Table 2

Laboratory Record Sheet

FIRE PROPAGATION TEST - BS476:PART 6:1989+A1:2009

Specimen No. : 2 **Date : 6-Apr-16**

Time mins t	Specimen Temperature Deg C Ts	Calibration Temperature Deg C Tc	Ts-Tc/10t	Sub Index Of Performance
0.50	12	13	0.00	
1.00	20	19	0.10	
1.50	26	24	0.13	
2.00	32	28	0.20	
2.50	38	33	0.20	
3.00	46	37	0.30	0.93
4.00	81	72	0.23	
5.00	132	110	0.44	
6.00	170	140	0.50	
7.00	199	163	0.51	
8.00	229	179	0.63	
9.00	259	194	0.72	
10.00	283	204	0.79	3.82
12.00	282	221	0.51	
14.00	259	229	0.21	
16.00	262	237	0.16	
18.00	265	242	0.13	
20.00	263	249	0.07	1.08
Total Index of Performance S			**=**	**5.83**

SubIndex s1 **0.93**

SubIndex s2 **3.82**

SubIndex s3 **1.08**

Index of Performance S **5.83**

Table 3

Laboratory Record Sheet

FIRE PROPAGATION TEST - BS476:PART 6:1989+A1:2009

Specimen No. : 3 **Date : 6-Apr-16**

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	**20**	**19**	**0.10**	
1.50	**28**	**24**	**0.27**	
2.00	**34**	**28**	**0.30**	
2.50	**40**	**33**	**0.28**	
3.00	**46**	**37**	**0.30**	**1.25**
4.00	**85**	**72**	**0.33**	
5.00	**135**	**110**	**0.50**	
6.00	**173**	**140**	**0.55**	
7.00	**210**	**163**	**0.67**	
8.00	**244**	**179**	**0.81**	
9.00	**281**	**194**	**0.97**	
10.00	**299**	**204**	**0.95**	**4.78**
12.00	**306**	**221**	**0.71**	
14.00	**278**	**229**	**0.35**	
16.00	**260**	**237**	**0.14**	
18.00	**255**	**242**	**0.07**	
20.00	**252**	**249**	**0.02**	**1.29**
Total Index of Performance S			**=**	**7.31**

SubIndex s1 **1.25**

SubIndex s2 **4.78**

SubIndex s3 **1.29**

Index of Performance S **7.31**

Revision History

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