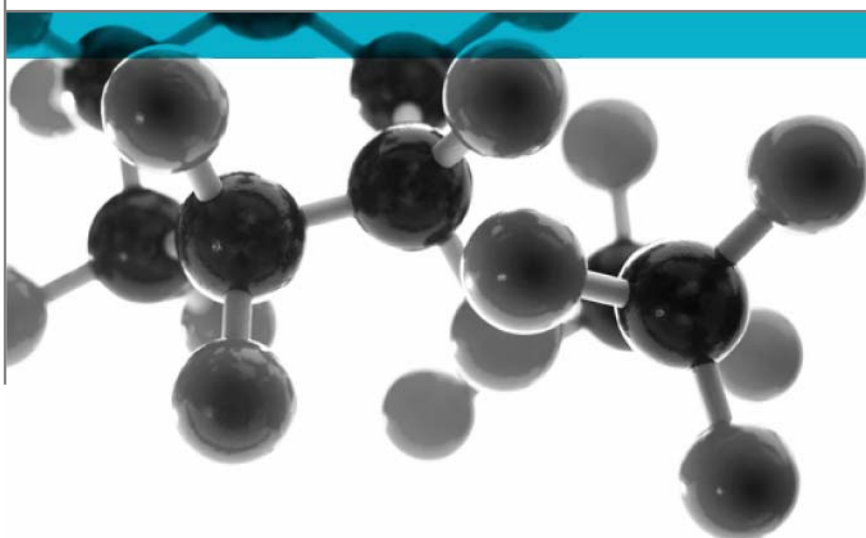


ENV 1187: 2002 Test 4



Incorporating Amendment No.1 – Test 4 – Two stage test method incorporating burning brands, wind and supplementary radiant heat

A Report To: Carlisle Syntec Europe B.V.

Document Reference: 316071

Date: 14th May 2012

Issue No.: 1

Page 1

Testing
Advising
Assuring

Executive Summary

Objective To determine the fire performance of the following product when tested in accordance with ENV 1187:2002 Test 4

Generic Description	Product reference	Thickness	Weight per unit area or density
A composite waterproof roofing material	"PIR Ply Faced"	148mm	19.5kg/m ²
Individual components used to manufacture composite:			
Waterproofing membrane (test face)	"RubberBond FleeceBack EPDM"	2.54mm	2.1kg/m ²
Adhesive	"WBA"	Not stated	250ml/m ²
Plywood faced insulation	"PIR Ply Faced"	126mm	6.3kg/m ²
Mechanical fixings	"Carlisle HP Fasteners / 75mm Plate washers"	Not stated	3 per m ²
OSB deck (reverse face)	"OSB3"	18mm	11.1kg/m ²
Please see pages 5 & 6 of this test report for the full description of the product tested			


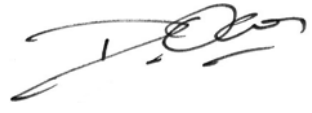

Test Sponsor Carlisle Syntec Europe B.V., P.O. Box 110, AC Zevenaar, 6900, The Netherlands

Test Results

	Specimen number	Time to fire penetration (min:sec)	Duration of flaming after withdrawal of test flame (min:sec)	Maximum flame spread distance (mm)
Stage 1	1	Did not penetrate	02:00	Zero
Stage 2	2	Did not penetrate	N/A	N/A
	3	Did not penetrate	N/A	N/A
	4	Did not penetrate	N/A	N/A

Date of Test: 13th April 2012

Signatories

	
Responsible Officer K. Hughes * Technical Officer	Approved D. J. Owen * Senior Technical Officer
	* For and on behalf of Exova Warringtonfire.
Authorised S. Deeming * Operations Manager	Report Issued: 14 th May 2012

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Test Details

Purpose of test

To determine the performance of specimens of a roof construction when they are subjected to the conditions of the test specified in ENV 1187:2002 Incorporating Amendment No.1 - Test 4 – Two stage test method incorporating burning brands, wind and supplementary radiant heat. This report should be read in conjunction with that European Standard.

The test data utilised in the preparation of this report has also been utilised for similar purposes in the case of the **Exova Warringtonfire** report WF No. 316070

The **Exova Warringtonfire** report WF No. 316070 utilises the data to evaluate and categorise the same product against the requirements of BS 476: Part 3: 2004, Incorporating Amendment 1 – “External Fire Exposure Roof Test”.

Scope of test

A two stage test method incorporating burning brands, wind and supplementary radiant heat which is designed to assess:

- a) the capacity of the roof construction to withstand fire penetration
- b) the capacity of the roof construction to produce flaming droplets or debris which fall from the underside or from the exposed surface

The test specimens are tested at an angle of 45° to the horizontal (sloping position) unless the roof construction is used at an angle of 10° or less to the horizontal, in which case the specimens are tested horizontally (flat position).

Fire test study group

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 13th April 2012 at the request of Carlisle Syntec Europe B.V., 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 20th February 2012. Prior to testing the specimens were conditioned to equilibrium in an atmosphere having a temperature of 23 ±2°C and a relative humidity of 45 to 55%.

Orientation of specimens

The specimens were tested in the flat position.

Description of Test Specimens

The description of the specimens given below has been prepared from information provided by a representative of the sponsor of the test. All values quoted are nominal, unless tolerances are given.

General description		A composite waterproof roofing material		
Product reference		"PIR Ply Faced"		
Overall thickness		148mm (stated by sponsor) 146.2mm (determined by Exova Warringtonfire)		
Overall weight per unit area		19.5kg/m ² (stated by sponsor) 21.3kg/m ² (determined by Exova Warringtonfire)		
Specimen configuration		<ul style="list-style-type: none"> • RubberBond FleeceBack EPDM • Adhesive • Plywood faced PIR • Mechanical fixing • OSB3 		
Waterproof membrane	Generic type		Waterproof membrane comprising EPDM coated polyester fleece	
	Product reference		"RubberBond FleeceBack EPDM"	
	Name of manufacturer		Carlisle Syntec	
	Thickness		2.54mm	
	Weight per unit area		2.1kg/m ²	
	EPDM	Generic type		EPDM
		Product reference		See Note 1 below
		Name of manufacturer		See Note 1 below
		Number of coats		One
		Thickness per coat		1.14mm
		Weight per unit area / density		See Note 1 below
		Colour reference		"Slate Grey"
		Flame retardant details		See Note 2 below
	Polyester fleece	Generic type		Polyester fleece
		Product reference		See Note 1 below
		Name of manufacturer		See Note 1 below
		Thickness		1.4mm
		Weight per unit area / density		See Note 1 below
		Colour reference		See Note 1 below
		Flame retardant details		See Note 2 below
Adhesive	Product reference		"WBA"	
	Generic type		Acrylic adhesive	
	Name of manufacturer		See Note 3 below	
	Application rate		250ml/m ²	
	Colour reference		"White"	
	Flame retardant details		See Note 2 below	

Continued on next page

Plywood faced insulation	Generic type		Plywood faced PIR insulation	
	Product reference		"PIR Ply Faced"	
	Name of manufacturer		See Note 3 below	
	Thickness		126mm	
	Weight per unit area		6.3kg/m ²	
	Product configuration		<ul style="list-style-type: none"> • Plywood • Insulation 	
	Plywood facing	Product reference		See Note 1 below
		Generic type		Plywood
		Name of manufacturer		See Note 1 below
		Thickness		6mm
		Number of ply's		See Note 1 below
		Density / weight per unit area		See Note 1 below
		Colour reference		"Brown"
	Flame retardant details		See Note 2 below	
	Bonding details		The facing is auto-adhesively bonded to the foam during the manufacturing process	
	Insulation	Product reference		See Note 1 below
		Generic type		PIR insulation
Name of manufacturer		See Note 1 below		
Thickness		See Note 1 below		
Density / weight per unit area		See Note 1 below		
Colour reference		"Yellow"		
Flame retardant details		See Note 2 below		
Mechanical fixings (Insulation layer to OSB deck)	Product reference		"Carlisle HP Fasteners / 75mm Plate Washers"	
	Generic type		Steel fastener / plate washers	
	Name of manufacturer		Carlisle Syntec	
	Application rate		3 per m ²	
	Colour reference		"Grey"	
	Flame retardant details		See Note 2 below	
Deck (reverse face)	Product reference		"OSB3"	
	Generic type		OSB3	
	Species		See Note 1 below	
	Name of manufacturer		See Note 1 below	
	Weight per unit area		11.1kg/m ²	
	Thickness		18mm	
	Flame retardant details		See Note 2 below	
Brief description of manufacturing process		See Note 1 below		

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 product / component.

Note 3. The sponsor of the test has provided this information but at the specific request of the sponsor, these details have been omitted from the report and are instead held on the confidential file relating to this investigation.

The description of the specimens as given above is not as detailed as would usually be the case for descriptions included in **Exova Warringtonfire** test reports and the description may not fully comply with the requirements of the test standard. In all other respects however the tests were conducted fully in accordance with the requirements of the test standard and the test results are valid.

Test Results

Results of test

The test results relate only to the behaviour of the test specimens of the construction under the particular conditions of test, they are not intended to be the sole criterion for assessing the potential fire hazard of the construction in use.

The test results relate only to the specimens of the roof construction which were tested. Small differences in the composition or thickness of the construction may significantly affect the results of the test and may therefore invalidate the test results. Care should be taken to ensure that any construction which is supplied or used is fully represented by the specimens which were tested.

The results of the tests on each of the specimens are given in Table 1.

Validity

The specification and interpretation of fire test methods is 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

PRELIMINARY IGNITION TEST WITH BURNING BRANDS (STAGE 1)	Specimen No:	
		1
Room temperature at start of test (°C)	24	
Time to fire penetration (if applicable) (min:sec)	Did not penetrate	
Duration of flaming after withdrawal of the test flame (if applicable) (min:sec)	02:00	
Maximum flame spread distance (if applicable) (mm)	Nil	

PENETRATION TEST WITH BURNING BRANDS, WIND AND SUPPLEMENTARY RADIANT HEAT (STAGE 2)	Specimen No:		
	2	3	4
Room temperature at start of test (°C)	28	29	29
Time to fire penetration (if applicable) (min:sec)	Did not penetrate	Did not penetrate	Did not penetrate
Additional observations:			
In the case of all three specimens tested, penetration did not occur.			

Table 2 Classes of External Fire Performance for Roofs/Roof Coverings In Accordance With 13501-5: 2005

Test Method	Class	Classification criteria
ENV 1187:2002, test 1	B _{Roof} (t1)	All of the following conditions shall be satisfied for any one test: <ul style="list-style-type: none"> - external and internal fire spread upwards <0.700m; - external and internal fire spread downwards<0.600m; - maximum burned length external and internal<0.800m; - no burning material (droplets or debris)falling from exposed side; - no burning/glowing particles penetrating the roof construction; - no single through opening>25mm² - sum of all through openings,4500mm² - lateral fire spread does not reach the edges of the measuring zone; - no internal glowing combustion; - maximum radius of fire spread on 'horizontal' roofs, external and internal <0.200m
	F _{Roof} (t1)	No performance determined
ENV 1187:2002, test 2	B _{Roof} (t2)	For both test series at 2m/s and 4m/s wind speed: <ul style="list-style-type: none"> - mean damaged length of the roof covering and substrate ≤ 0.550m; - max damaged length of the roof covering and substrate ≤ 0.800m.
	F _{Roof} (t2)	No performance determined
ENV 1187:2002, test 3	B _{Roof} (t3)	T _E ≥ 30 min and T _p ≥ 30 min
	C _{Roof} (t3)	T _E ≥ 10 min and T _p ≥ 15 min
	D _{Roof} (t3)	T _p > 5 min
	F _{Roof} (t3)	No performance determined
ENV 1187:2002, test 4	B _{Roof} (t4)	<ul style="list-style-type: none"> - No penetration of roof system within 1 h - In preliminary test after withdrawal of the test flame, specimens burn for <5 min - In preliminary test, flame spread <0.38m across region of burning.
	C _{Roof} (t4)	<ul style="list-style-type: none"> - No penetration of roof system within 30 min - In preliminary test after withdrawal of the test flame, specimens burn for <5 min - In preliminary test, flame spread <0.38m across region of burning.
	D _{Roof} (t4)	<ul style="list-style-type: none"> - Roof system is penetrated within 30 min but is not penetrated in the preliminary test. - In preliminary test after withdrawal of the test flame, specimens burn for <5 min - In preliminary test, flame spread <0.38m across region of burning.
	E _{Roof} (t4)	<ul style="list-style-type: none"> - Roof system is penetrated within 30 min but is not penetrated in the preliminary test. - Flame spread is not controlled
	F _{Roof} (t4)	No performance determined

Revision History

Issue No :	Issue Date:
Revised By:	Approved By:
Reason for Revision:	

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