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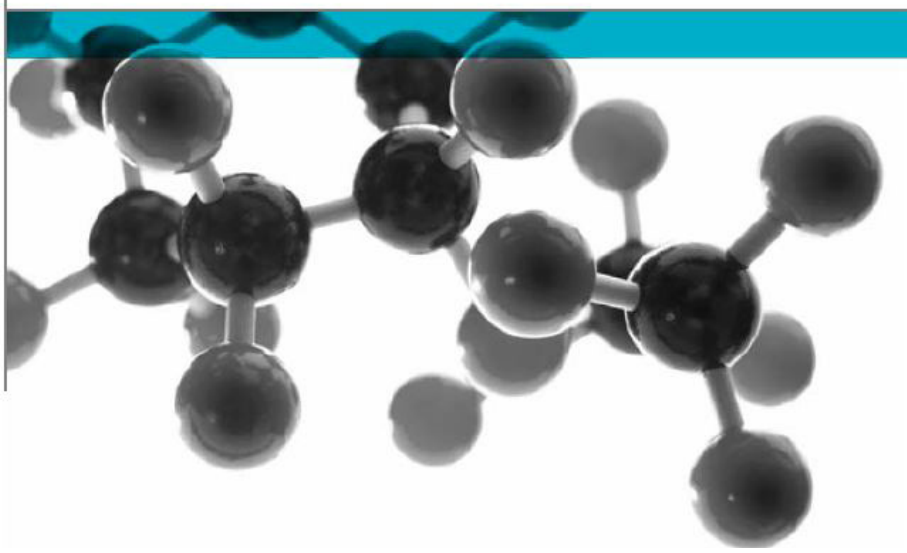
BS EN ISO 9239-1: 2010



Fire Tests For Determination Of The Burning Behaviour of Floorings
Part 1: Determination Of The Burning Behaviour Using A Radiant Heat Source

A Report To: Amtico International

Document Reference: 305442

Date: 24th March 2011

Issue No.: 1

Testing
Advising
Assuring

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Executive Summary

Objective To determine the performance of the following product when tested in accordance with BS EN ISO 9239-1: 2010

Generic Description	Product reference	Thickness	Weight per unit area or density
Decorative vinyl laminated floor tile which was tested adhered to a 6mm fibre cement board substrate utilising "Amtico SF Adhesive"	"Amtico" (floor covering only)	2.5mm (floor covering only)	3.1kg/m^2 (floor covering only)
Individual components used to manufacture composite:			
Vinyl wear layer	Not stated	1.0mm	1.24kg/m^2
Vinyl face	Not stated	0.5mm	0.62kg/m^2
Vinyl backing	Not stated	1.0mm	1.24kg/m^2
Acrylic adhesive	"Amtico SF Adhesive"	Not applicable	300 to 350g/m^2
Fibre cement board	"NT D4 604"	6mm	1800kg/m^3
Please see page 6 of this test report for the full description of the product tested			

Test Sponsor Amtico International, Kingfield Road, Coventry, CV6 5AA

Test Results:

Orientation of test specimens : Production direction		
Average critical radiant flux	**=**	**10.0kW/m^2**
Average smoke development	**=**	**250.47% min**

Date of Test 22nd March 2011

Signatories

Responsible Officer C. Jacques * Acting Testing Officer	**PP – S. Deeming** Authorised C. Dean * Operations Manager

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

Report Issued: 24th March 2011

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Test Details

Purpose of test

To determine the performance of specimens of a product when they are subjected to the conditions of the test procedure defined in the document BS EN ISO 9239-1:2010 - Reaction To Fire Tests For Floorings – Part 1: Determination Of The Burning Behaviour Using A Radiant Heat Source.

The test was performed in accordance with the procedure defined in BS EN ISO 9239-1:2010 and this report should be read in conjunction with that Standard.

Scope of test

BS EN ISO 9239-1:2010 describes a European test procedure for assessing the burning behaviour, spread of flame and smoke development of horizontally mounted floorcovering systems exposed to a radiant heat gradient in a test chamber, when ignited with a pilot flame.

The measurements provide a basis for estimating one aspect of fire exposure behaviour of floor covering systems. The imposed radiant flux simulates the thermal radiation levels likely to impinge on the floors of a building whose upper surfaces are heated by flames or hot gases or both, from a fire in an adjacent room or compartment.

This method is applicable to all types of floorcoverings such as textile carpet, cork, wood, rubber and plastic coverings as well as coatings. Results obtained by this method reflect the performance of the total floor covering system as tested. Modifications of the backing, bonding to a substrate, underlay, or other changes to the system may affect the test results.

The test is intended for regulatory purposes, specification acceptance, design purposes, classification, or development and research.

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 has 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 22nd March 2011 at the request of The Amtico Company Limited, the sponsor of the test.

Provision of test specimens

The specimens and adhesive were supplied by the sponsor of the test. **Exova Warringtonfire** was not involved in any selection or sampling procedure. **Exova Warringtonfire** supplied the adh3esive and substrate and bonded the composite together.

Conditioning of specimens

The specimens were received on the 10th March 2011

Prior to test the specimens were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 5%.

Number of specimens tested

A total of four specimens were tested. Initial tests were carried out on one specimen in the production direction and one specimen in a direction perpendicular to that direction to establish the worse case condition. The results of these tests indicated that the worse case was with the specimens in the production direction and the formal test was then completed with the specimens in that direction.

Exposed face

The decorative face of the specimens was exposed to the radiant heat of the test when the specimens were mounted in the test position.

Substrate

The specimens were tested adhered to a nominally 6mm thick fibre cement board substrate utilising "Amtico SF Adhesive".

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			Decorative vinyl laminated floor tile which was tested adhered to a 6mm fibre cement board substrate utilising "Amtico SF Adhesive"
Overall thickness of composite			8.42mm (determined by **Exova Warringtonfire**)
Overall weight per unit area composite			14.1kg/m^2 (determined by **Exova Warringtonfire**)
Floorcovering	Product reference		"Amtico"
	Generic type		Decorative vinyl laminated floor tile
	Name of manufacturer		Amtico International
	Overall thickness of floor covering		2.5mm
	Overall weight per unit area floor covering		3.1kg/m^2
	Colour reference		"Brown" (observed by **Exova Warringtonfire**)
	Pattern reference		"R-W760"
	Wear layer	Product reference	**See Note 1 Below**
		Generic type	Plasticized vinyl
		Name of manufacturer	Amtico International
		Thickness	1.0mm
		Weight per unit area	1.24kg/m^2
		Application method	Lamination
		Flame retardant details	**See Note 2 Below**
	Face	Product reference	**See Note 1 Below**
		Generic type	Plasticized vinyl
		Name of manufacturer	Amtico International
		Thickness	0.5mm
		Weight per unit area	0.62kg/m^2
		Flame retardant details	**See Note 2 Below**
	Backing	Product reference	**See Note 1 Below**
		Generic type	Plasticized vinyl
		Name of manufacturer	Amtico International
		Thickness	1.0mm
		Weight per unit area	1.24kg/m^2
		Application method	Lamination
		Flame retardant details	**See Note 2 Below**
Adhesive		Product reference	"Amtico SF Adhesive"
		Generic type	Acrylic
		Name of manufacturer	**See Note 2 Below**
		Application rate	Between 300 and 350g/m^2
		Application method	Trowel
		Flame retardant details	**See Note 2 Below**

Continued on next page

Substrate	Product reference	"NT D4 604"
	Generic type	Fibre cement board
	Name of supplier	Scheerders van de Kerkhove (SVK)
	Overall thickness	6mm
	Density	1800kg/m³
Brief description of manufacturing process of the floor covering		Film production by calender followed by heat lamination of separate layers

Note 1: The sponsor of the test was unwilling to provide this information.

Note 2: The sponsor of the test has confirmed no flame retardants were used in the production of the product / component.

Test Results

The test results relate to the behaviour of the test specimens of a 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.

The distance between the flame front and the zero point at 10 minute intervals together with the observations recorded during the tests in respect of each specimen tested, are given in Table 1.

In accordance with the procedure defined in BS EN ISO 9239-1:2010: the following average results were obtained for the specimens cut in the production direction (↑):

Average maximum flame front distance	=	17cm
Average critical radiant flux	=	10.0kW/m^2
Average smoke development	=	250.47% min
Average maximum light attenuation	=	69.45%

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

SPECIMEN NO.	1	2	3	4
Orientation (Production direction (↑) or 90° to production direction (→))	↑	→	↑	↑
DISTANCE (cm)	**TIME TO TRAVEL TO INDICATED DISTANCE** (minutes : seconds)			
5	2:55	2:59	3:58	2:50
10	3:48	3:50	4:08	3:49
15	5:20	5:38	5:12	5:31
20				
25				
30				
35				
40				
45				
50				
55				
60				
65				
70				
75				
80				
85				
90				
95				
100				
Maximum flame front distance (cm)	19	16	17	16
Critical radiant flux (kW/m^2)	9.6	10.3	10.1	10.3
Smoke Development (%.min)	246.45	255.75	255.02	249.94
Maximum light attenuation (%)	70.43	69.68	69.98	67.94

Specimen Number	1	2	3	4
Flame front distance at 10 min (cm)	3	3	3	3
Flame front distance at 20 min (cm)	-	-	-	-
Flame front distance at 30 min (cm)	-	-	-	-
Radiant flux at 10 minutes, Rf_{10} (kW/m^2)	≥11.3	≥11.3	≥11.3	≥11.3
Radiant flux at 20 minutes, Rf_{20} (kW/m^2)	-	-	-	-
Radiant flux at 30 minutes, Rf_{30} (kW/m^2)	-	-	-	-

Observations of the burning characteristics of the specimens during the testing exposure

In the case of each specimen tested, flash flaming was observed, extending up to a maximum distance of 200mm

Revision History

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

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