

**BS EN ISO 9239-1:
2002**

**Fire Tests For
Determination Of The
Burning Behaviour of
Floorings**

WF Report Number:

161319

Date:

2nd March 2007

Test Sponsor:

**NanTong Composite Super
Material
Company Limited**

**Bodycote warringtonfire Test
Report No. 161319**

**BS EN ISO 9239-1: 2002 – Reaction
To Fire Tests For Floorings – Part 1:
Determination Of The Burning
Behaviour
Using A Radiant Heat Source**

Sponsored By

**NANTONG SUPER COMPOSITE
MATERIAL COMPANY LIMITED
NO. 188 MIANJI ROAD
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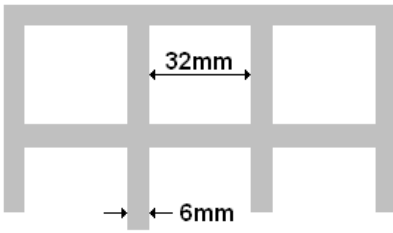
Test Details

Purpose of test	<p>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 9239-1:2002 - Reaction To Fire Tests For Floorings – Part 1: Determination Of The Burning Behaviour Using A Radiant Heat Source.</p> <p>The test was performed in accordance with the procedure defined in BS EN ISO 9239-1:2002 and this report should be read in conjunction with that Standard.</p>
Scope of test	<p>BS EN ISO 9239-1:2002 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.</p> <p>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.</p> <p>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.</p> <p>The test is intended for regulatory purposes, specification acceptance, design purposes, classification, or development and research.</p>
Fire test study group/EGOLF	<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>
Instruction to test	<p>The test was conducted on the 27th January 2007 at the request of NanTong Super Composite Material Company Limited, the sponsor of the test.</p>
Provision of test specimens	<p>The specimens of grating were supplied by the sponsor of the test. Bodycote warringtonfire was not involved in any selection or sampling procedure. Bodycote warringtonfire supplied the particleboard substrate.</p>

Conditioning of specimens	<p>The specimens were received on the 19th January 2007</p> <p>Prior to test the specimens were conditioned to constant mass at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$.</p>
Number of specimens tested	<p>A total of three specimens were tested.</p>
Exposed face	<p>One of two identical faces of the specimens was exposed to the radiant heat of the test when the specimens were mounted in the test position.</p>
Substrate	<p>The specimens were tested with an 18mm thick non flame retardant grade particleboard substrate present.</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		A flame retardant grade, fibre reinforced resin grating	
Product reference		"SUPERFRP-IFR"	
Thickness		15mm	
Weight per unit area		12.0 kg/m ²	
Colour reference		"Grey"	
Name of manufacturer		NanTong Super Composite Material Co., Ltd.	
Diagram of grating		 <p style="text-align: center;">Note: Not to scale</p>	
Fibre reinforced resin grating	Resin	Generic type	Isophthalic polyester resin
		Product reference	"SUPERFRP-IFR"
		Name of manufacturer	See Note 1 Below
		Composition details	See Note 2 Below
		Trade name of flame retardant	See Note 1 Below
		Generic type of flame retardant	See Note 1 Below
		Amount of flame retardant (%)	See Note 2 Below
	Reinforce-ment	Generic type	Fibre glass
		Product reference	"100% Fibergalss"
		Name of manufacturer	See Note 1 Below
		Composition details	100% no- alkaline fiberglass
		Configuration of reinforcement	Randomly dispersed throughout the product
		Flame retardant details	See Note 1 Below
	Percentage reinforcement (by weight)		See Note 1 Below
Resin to reinforcement ratio (by weight)		See Note 1 Below	
Substrate	Product reference	Particle Board	
	Overall thickness	18mm	
	Density	680±50 Kg/m ³	
	Flame retardant details	No Flame retardant present	
Brief description of manufacturing process of fibre reinforce resin grating		Moulded product. The sponsor did not provide any further information relating to the manufacturing process	

Note 1 – The sponsor was unwilling to provide this information

Note 2 – 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 given above is not as complete as would normally be the case for descriptions included in Bodycote warringtonfire test reports, and the description does not fully comply with the requirements of the standard. In all other respects, however, the tests were conducted fully in accordance with the requirements of the standard and the test results are valid.

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 9239-1:2002, the following results were obtained:

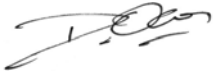
Average maximum flame front distance	=	15 cm
Average critical radiant flux	=	10.8 kW/m ²
Average smoke development	=	274.0 % min
Average maximum light attenuation	=	23.7 %


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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* For and on behalf of **Bodycote warringtonfire**.

Report Issued: 2 nd March 2007

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Table 1

SPECIMEN NO.	1	2	3
DISTANCE (cm)	TIME TO TRAVEL TO INDICATED DISTANCE (minutes, seconds)		
5	6:53	7:19	6:09
10	15:38	15:21	17:40
15	26:02	24:59	27:52
20			
25			
30			
35			
40			
45			
50			
55			
60			
65			
70			
75			
80			
85			
90			
95			
100			
Max. flame front distance (cm)	15	15	15
Critical radiant flux (kW/m^2)	10.8	10.8	10.8
Smoke Development (%.min)	270.3	284.6	267.3
Max. light attenuation (%)	17.4	25.8	28.0

Specimen Number	1	2	3
Flame front distance at 10 min (cm)	7	7	7
Flame front distance at 20 min (cm)	12	12	12
Flame front distance at 30 min (cm)	15	15	15
Radiant flux at 10 minutes, $R_{f_{10}}$ (kW/m^2)	≥ 11.2	≥ 11.2	≥ 11.2
Radiant flux at 20 minutes, $R_{f_{20}}$ (kW/m^2)	≥ 11.2	≥ 11.2	≥ 11.2
Radiant flux at 30 minutes, $R_{f_{30}}$ (kW/m^2)	10.8	10.8	10.8

Observations Of The Burning Characteristics Of The Specimens During The Testing Exposure

None.



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