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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: Ecodek

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Testing
Advising
Assuring



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	Density
Wood and high density polyethylene (HDPE) composite	"Ecodek"	21mm	1.11±0.05g/cm ³
Please see page 6 of this test report for the full description of the product tested			


Test Sponsor Ecodek, Unit 13, Abenbury Way, Wrexham Industrial Estate, Wrexham, LL13 9UZ

Test Results: **Orientation of test specimens : Production direction**


Average critical radiant flux	=	2.9kW/m²
Average smoke development	=	147.67% min

Date of Test 20th October 2017


Signatories



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

Report Issued: 20th November 2017

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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 9239-1:2010 - 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 9239-1:2010 and this report should be read in conjunction with that Standard.</p>
Scope of test	<p>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.</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 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.</p>
Instruction to test	<p>The test was conducted on the 20th October 2017 at the request of Ecodek, the sponsor of the test.</p>
Provision of test specimens	<p>The specimens were supplied by the sponsor of the test. Exova Warringtonfire was not involved in any selection or sampling procedure.</p>
Conditioning of specimens	<p>The specimens were received on the 22nd September 2017.</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

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 loose laid over a nominally 8mm thick fibre cement board substrate (as specified in EN 13238: 2010) present.

Description of Test Specimens

The description of the system given below has been prepared from information provided by the sponsor of the test. This information has not been independently verified by **Exova Warringtonfire**.

All values quoted are nominal, unless tolerances are given.

General description	Wood and high density polyethylene (HDPE) composite
Product reference	"Ecodek"
Name of manufacturer	Vannplastic
Thickness	21mm (stated by sponsor) 20.34mm (determined by Exova Warringtonfire)
Density	1.11±0.5g/cm ³ (stated by sponsor) 1.04g/cm ³ (determined by Exova Warringtonfire)
Colour reference	"Grey" (determined by Exova Warringtonfire)
Flame retardant details	See Note 1 Below
Brief description of manufacturing process	Extrusion

Note 1: The sponsor of the test confirmed that no flame retardants were used in the production of this product.

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	=	56cm
Average critical radiant flux	=	2.9kW/m ²
Average smoke development	=	147.67% min

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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Table 1

SPECIMEN NO.	1	2	3	4
Orientation (Production direction (↑) or 90° to production direction (→))	↑	→	↑	↑
DISTANCE (cm)	TIME TO TRAVEL TO INDICATED DISTANCE (seconds)			
5	180	261	204	204
10	282	357	309	309
15	357	432	402	372
20	426	501	483	471
25	498	573	558	546
30	547	663	657	633
35	672	786	795	726
40	819	1026	966	915
45	957	1317	1221	1140
50	1137	1659	1464	1428
55	1392			
60	1671			
65				
70				
75				
80				
85				
90				
95				
100				
Maximum flame front distance (cm)	61	51	54	54
Critical radiant flux (kW/m ²)	2.4	3.6	3.2	3.2
Smoke Development (%.min)	145.79	158.55	147.37	149.83

Specimen Number	1	2	3	4
Flame front distance at 10 min (cm)	31	26	28	29
Flame front distance at 20 min (cm)	50	43	44	45
Flame front distance at 30 min (cm)	61	51	54	54
Radiant flux at 10 minutes, Rf ₁₀ (kW/m ²)	7.2	8.4	7.8	7.0
Radiant flux at 20 minutes, Rf ₂₀ (kW/m ²)	3.6	4.8	4.6	4.4
Radiant flux at 30 minutes, Rf ₃₀ (kW/m ²)	2.4	3.6	3.2	3.2

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

None

Revision History

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

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