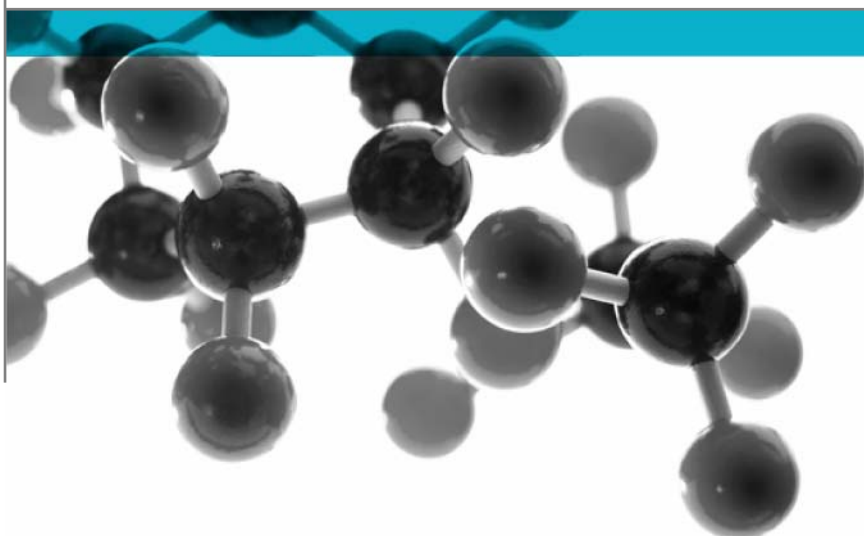


BS EN ISO 9239-1: 2010



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: Mannington Mills

Document Reference: Additional test report No. 335083

Date: 16th December 2013

Issue No.: 1

Page 1

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 | Weight per unit area or density |
|---|---|---------------------|--------------------------------------|
| A homogenous slip resistant plasticised PVC flooring | "Biospec SR / Assurance II" (flooring only) | 2mm (flooring only) | 3.2kg/m ² (flooring only) |
| Individual components used to manufacture composite: | | | |
| Floor covering | "Biospec SR / Assurance II" | 2mm | 3.2kg/m ² |
| Substrate | "Particle Board" | 18mm | 600kg/m ³ |
| Please see page 6 of this test report for the full description of the product tested | | | |

Test Sponsor Mannington Mills, 75 Mannington Mills Road, Salem, New Jersey 08079, USA

Test Results:



| | | |
|--------------------------------------|---|----------------------------|
| Average critical radiant flux | = | 9.0kW/m² |
| Average smoke development | = | 165.92% min |

Date of Test 28th August 2013

This test report is additional to that issued as 332499 dated the 10th September 2013 and has been issued at the request of the sponsor. The original test report remains valid and is not replaced by this additional test report. The product referred to in the original report and this additional test report has not been re-tested since the original test and neither has a technical review of the original test report resulting in any technical changes been carried out.

The original product reference has been removed and the reference "Biospec SR / Assurance II" has been inserted. The original sponsor's name has been removed and "Mannington Mills" has been inserted. The sponsor of the test has stated that the material described in this additional report is identical to the material which was tested. Both the original and the alternative trade names of the product and the original and alternative names and addresses of the sponsor have been documented and the documentation is maintained in the confidential file covering this investigation.

Signatories

| | |
|---|--|
|  |  |
| Responsible Officer C. Jacques * Technical Officer | Authorised S. Deeming * Operations Manager |

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

Report Issued: 16th December 2013

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| | | | |
|---------------|-----------------------------------|-------------|--------------------------------|
| Document No.: | Additional test report No. 335083 | Page No.: | 2 of 9 |
| Author: | C. Jacques | Issue Date: | 16 th December 2013 |
| Client: | Mannington Mills | Issue No.: | 1 |



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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 28th August 2013 at the request of the original sponsor of the test.

Provision of test specimens

The specimens were supplied by the original 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 August 2013

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 $50 \pm 5\%$.

| | |
|-----------------------------------|--|
| Number of specimens tested | The specimens had no directional quality so only three specimens were tested |
| 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 an nominally 18mm thick particleboard substrate |

Description of Test Specimens

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

| | | |
|--|-------------------------|--|
| General description | | A homogenous slip resistant plasticised PVC flooring |
| Floor covering (Test face) | Product reference | "Biospec SR / Assurance II", |
| | Generic type | Vinyl tile |
| | Name of supplier | Mannington Mills |
| | Weight per unit area | 3.2kg/m ² (stated by sponsor) 3.21kg/m ² (determined by Exova Warringtonfire) |
| | Thickness | 2.00mm (stated by sponsor) 1.99mm (determined by Exova Warringtonfire) |
| | Colour | Any colour / pattern |
| | Flame retardant details | See Note 1 Below |
| Substrate | Trade name | "Particle Board" |
| | Generic type | Particle Board |
| | Name of supplier | SA Joinery |
| | Thickness | 18mm |
| | Density | 600kg/m ³ |
| Brief description of manufacturing process of the floor covering | | The sponsor of the test was unwilling to provide this information |

Note 1: The original sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the 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.

| | | |
|--------------------------------------|---|----------------------|
| Average maximum flame front distance | = | 22cm |
| Average critical radiant flux | = | 9.0kW/m ² |
| Average smoke development | = | 165.92% min |
| Average maximum light attenuation | = | 52.40% |

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 |
|---|--|----------------|----------------|
| Orientation (Production direction (↑) or 90° to production direction (→)) | Not applicable | Not applicable | Not applicable |
| DISTANCE (cm) | TIME TO TRAVEL TO INDICATED DISTANCE (minutes : seconds) | | |
| 5 | 2:12 | 2:12 | 2:13 |
| 10 | 2:32 | 2:34 | 2:30 |
| 15 | 3:08 | 2:58 | 2:56 |
| 20 | 3:50 | 3:47 | 4:07 |
| 25 | | | |
| 30 | | | |
| 35 | | | |
| 40 | | | |
| 45 | | | |
| 50 | | | |
| 55 | | | |
| 60 | | | |
| 65 | | | |
| 70 | | | |
| 75 | | | |
| 80 | | | |
| 85 | | | |
| 90 | | | |
| 95 | | | |
| 100 | | | |
| Maximum flame front distance (cm) | 21 | 22 | 23 |
| Critical radiant flux (kW/m ²) | 9.2 | 9.0 | 8.8 |
| Smoke Development (%.min) | 149.31 | 165.15 | 183.28 |
| Maximum light attenuation (%) | 49.49 | 56.27 | 51.44 |

| Specimen Number | 1 | 2 | 3 |
|---|-------|------|-----|
| Flame front distance at 10 min (cm) | 8 | 12 | 21 |
| Flame front distance at 20 min (cm) | - | - | - |
| Flame front distance at 30 min (cm) | - | - | - |
| Radiant flux at 10 minutes, Rf ₁₀ (kW/m ²) | ≥11.0 | 10.8 | 9.2 |
| 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

None

Revision History

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

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| Reason for Revision: | |