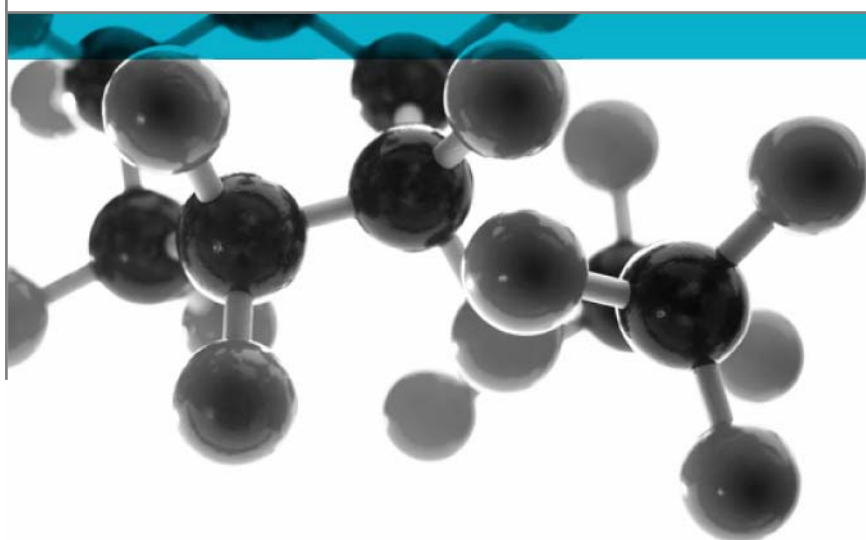


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# BS 476: Part 7: 1997



## Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Geaves Surface Solutions Ltd

Document Reference: 325452

Date: 4<sup>th</sup> April 2013

Issue No.: 2

Page 1

Testing  
Advising  
Assuring



## Executive Summary

**Objective** To determine the surface spread of flame classification of the following product when tested in accordance with BS 476: Part 7: 1997.

| Generic Description  | Product reference    | Thickness         | Weight per unit area or density |
|--|----------------------|-------------------|---------------------------------|
| Stylam flame retardant high pressure laminate (HPL) adhered to medium density fibreboard (MDF) on both sides | "Stylam FR Laminate" | 20mm              | 750kg/m <sup>3</sup>            |
| <b>Individual components used to manufacture composite:</b>  |                      |                   |                                 |
| Laminate (facings)   | "113 Palm Green HPL" | 0.9mm             | 1000kg/m <sup>3</sup>           |
| • Paper  | "113"                | Unable to provide | Unable to provide               |
| • Resin  | Unable to provide    | Unable to provide | Unable to provide               |
| Core paper   | Unable to provide    | Unable to provide | Unable to provide               |
| Core resin   | Unable to provide    | Unable to provide | Unable to provide               |
| Adhesive   | "CP12"               | Unable to provide | Unable to provide               |
| MDF  | Unable to provide    | Unable to provide | Unable to provide               |
| <b>Please see page 5 of this test report for the full description of the product tested</b>                  |                      |                   |                                 |



**Test Sponsor** Geaves Surface Solutions Ltd, Lyon House, 81 Haltwhistle Road, South Woodham Ferrers, Essex, CM3 5ZA.

**Test Results:** **Class 1**

**Date of Test** 1<sup>st</sup> February 2013

**Reason for revision** This document replaces issue 1 (dated 25<sup>th</sup> February 2013) of the same number which has been withdrawn. The product reference of the composite has been changed at the request of the sponsor. The product reference has been amended in this issue 2 report.

## Signatories

|   |  |
|---|--|
|  |  |
| Responsible Officer<br>C. Meachin *<br>Acting Testing Officer                       | Authorised<br>M. Dale *<br>Deputy Operations Manager                                 |

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

Report Issued: 4<sup>th</sup> April 2013

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|               |                              |             |                            |
|---------------|------------------------------|-------------|----------------------------|
| Document No.: | 325452                       | Page No.:   | 2 of 11                    |
| Author:       | C. Meachin                   | Issue Date: | 4 <sup>th</sup> April 2013 |
| Client:       | Geaves Surface Solutions Ltd | Issue No.:  | 2                          |



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## Test Details

|  |   |
|--|---|
| <b>Purpose of test</b>                         | To determine the performance of a product when it is subjected to the conditions of the test specified in BS 476: Part 7: 1997, "Fire tests on building materials and structures, method for classification of the surface spread of flame of products". This test was therefore performed in accordance with the procedure specified in BS 476: Part 7: 1997, and this report should be read in conjunction with that British Standard.        |
| <b>Scope of test</b>                           | BS 476: Part 7: 1997 specifies a method of test for measuring the lateral spread of flame along the surface of a specimen of a product orientated in the vertical position, and a classification system based on the rate and extent of flame spread. It provides data suitable for comparing the performances of essentially flat materials, composites, or assemblies, which are used primarily as the exposed surfaces of walls or ceilings. |
| <b>Fire test study group/EGOLF</b>             | 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.   |
| <b>Instruction to test</b>                     | The test was conducted on the 1 <sup>st</sup> February 2013 at the request of Geaves Surface Solutions Ltd, the sponsor of the test.  |
| <b>Provision of test specimens</b>             | The specimens were supplied by the sponsor of the test. <b>Exova Warringtonfire</b> was not involved in any selection or sampling procedure.  |
| <b>Conditioning of specimens</b>               | The specimens were received on the 14 <sup>th</sup> January 2013 and were conditioned to constant mass at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$ prior to testing.   |
| <b>Form in which the specimens were tested</b> | Assembly - Fabrication of materials and/or composites that can contain air gaps. Each specimen was placed over 25mm thick by 20mm wide calcium silicate based spacers positioned around its perimeter and mounted onto a backing board so that a 25mm enclosed air gap was provided between the unexposed face of the specimen and the backing board.   |
| <b>Exposed face</b>                            | One of two identical faces of the specimens was exposed to the heating conditions of the test.  |

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Author: C. Meachin

Issue Date: 4<sup>th</sup> April 2013

Client: Geaves Surface Solutions Ltd

Issue No.: 2



## 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               |                    | Stylam flame retardant high pressure laminate adhered to MDF on both sides  |  |                             |
| Product reference of composite    |                    | "Stylam FR Laminate"  |  |                             |
| Name of manufacturer of composite |                    | Geaves Surface Solutions  |  |                             |
| Thickness of composite            |                    | 20mm (stated by sponsor)<br>19.69mm (determined by <b>Exova Warringtonfire</b> )  |  |                             |
| Density of composite              |                    | 750kg/m <sup>3</sup> (stated by sponsor)<br>713.4kg/m <sup>3</sup> (determined by <b>Exova Warringtonfire</b> )                                     |  |                             |
| Product configuration             |                    | <ul style="list-style-type: none"> <li>• Laminate (test face)</li> <li>• Adhesive</li> <li>• MDF</li> <li>• Adhesive</li> <li>• Laminate</li> </ul> |  |                             |
| Laminate                          | Facing (test face) | Product reference   |  | "113 Palm Green HPL"        |
|                                   |                    | Name of manufacturer  |  | Stylam                      |
|                                   |                    | Thickness of laminate   |  | 0.9mm                       |
|                                   |                    | Density of laminate   |  | 1000kg/m <sup>3</sup>       |
|                                   | Paper              | Generic type  |  | Kraft paper and décor paper |
|                                   |                    | Product reference   |  | "113"                       |
|                                   |                    | Detailed description / composition details  |  | Kraft paper and décor paper |
|                                   |                    | Name of manufacturer  |  | <b>See Note 1 below</b>     |
|                                   |                    | Thickness   |  | <b>See Note 1 below</b>     |
|                                   |                    | Density / weight per unit area  |  | <b>See Note 1 below</b>     |
|                                   |                    | Colour reference  |  | "113"                       |
|                                   | Resin              | Flame retardant details   |  | <b>See Note 1 below</b>     |
|                                   |                    | Generic type  |  | Melamine                    |
|                                   |                    | Product reference   |  | <b>See Note 1 below</b>     |
|                                   |                    | Name of manufacturer  |  | <b>See Note 1 below</b>     |
| Application rate / thickness      |                    | <b>See Note 1 below</b>   |  |                             |
| Application method                |                    | <b>See Note 1 below</b>   |  |                             |
| Flame retardant details           |                    | <b>See Note 1 below</b>   |  |                             |
| Curing process                    |                    | <b>See Note 1 below</b>   |  |                             |

- Continued on next page

|  |  |                         |  |                             |
|--|--|-------------------------|--|-----------------------------|
| Laminate continued                         | Core   | Paper                   | Generic type                               | Kraft                       |
|  |  |                         | Product reference                          | <b>See Note 1 below</b>     |
|  |  |                         | Detailed description / composition details | Kraft paper                 |
|  |  |                         | Name of manufacturer                       | <b>See Note 1 below</b>     |
|  |  |                         | Thickness                                  | <b>See Note 1 below</b>     |
|  |  |                         | Density / weight per unit area             | <b>See Note 1 below</b>     |
|  |  |                         | Colour reference                           | <b>See Note 1 below</b>     |
|  |  |                         | Flame retardant details                    | <b>See Note 1 below</b>     |
|  |  | Resin                   | Generic type                               | Phenolic                    |
|  |  |                         | Product reference                          | <b>See Note 1 below</b>     |
|  |  |                         | Name of manufacturer                       | <b>See Note 1 below</b>     |
|  |  |                         | Application rate / thickness               | <b>See Note 1 below</b>     |
|  |  |                         | Application method                         | <b>See Note 1 below</b>     |
|  |  |                         | Flame retardant details                    | <b>See Note 1 below</b>     |
|  | Curing process   | <b>See Note 1 below</b> |  |                             |
|  | Reverse face   | Paper                   | Generic type                               | Kraft paper and décor paper |
|  |  |                         | Product reference                          | "113"                       |
|  |  |                         | Detailed description / composition details | Kraft paper and décor paper |
|  |  |                         | Name of manufacturer                       | <b>See Note 1 below</b>     |
|  |  |                         | Thickness                                  | <b>See Note 1 below</b>     |
|  |  |                         | Density / weight per unit area             | <b>See Note 1 below</b>     |
|  |  |                         | Colour reference                           | "113"                       |
|  |  |                         | Flame retardant details                    | <b>See Note 1 below</b>     |
|  |  | Resin                   | Generic type                               | Melamine                    |
|  |  |                         | Product reference                          | <b>See Note 1 below</b>     |
|  |  |                         | Name of manufacturer                       | <b>See Note 1 below</b>     |
|  |  |                         | Application rate / thickness               | <b>See Note 1 below</b>     |
|  |  |                         | Application method                         | <b>See Note 1 below</b>     |
|  |  |                         | Flame retardant details                    | <b>See Note 1 below</b>     |
|  | Curing process   | <b>See Note 1 below</b> |  |                             |
|  | Adhesive   | Generic type            | Water based vinyl                          |                             |
|  |  | Product reference       | "CP12"                                     |                             |
|  |  | Name of manufacturer    | Ace Adhesives                              |                             |
| Colour reference                           |  | <b>See Note 1 below</b> |  |                             |
| Application rate / thickness               |  | <b>See Note 1 below</b> |  |                             |
| Application method                         |  | <b>See Note 1 below</b> |  |                             |
| Flame retardant details                    |  | <b>See Note 1 below</b> |  |                             |
| Curing process                             |  | <b>See Note 1 below</b> |  |                             |
| MDF  | Generic type   | Euro class C MDF        |  |                             |
|  | Product reference  | <b>See Note 1 below</b> |  |                             |
|  | Timber species   | <b>See Note 1 below</b> |  |                             |
|  | Thickness  | <b>See Note 1 below</b> |  |                             |
|  | Density / weight per unit area                                       | <b>See Note 1 below</b> |  |                             |
|  | No. of Ply's (plywood only)  | <b>See Note 1 below</b> |  |                             |
|  | Trade name of adhesive used to bond the wood together (plywood only) | <b>See Note 1 below</b> |  |                             |
|  | Name of manufacturer / supplier                                      | Medite                  |  |                             |
|  | Flame retardant details  | <b>See Note 1 below</b> |  |                             |
|  | Cycle details  | <b>See Note 1 below</b> |  |                             |
| Brief description of manufacturing process |  |                         | <b>See Note 1 below</b>                    |                             |

**Note 1 - The sponsor was unable to provide this information.**

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 and observations** The test results for the individual specimens, together with observations made during the test and comments on any difficulties encountered during the test are given in Appendix 1.

**Classification** **In accordance with the class definitions given in BS 476: Part 7: 1997, the specimens tested are classified as Class 1.**

**Criteria for classification** If the prefix 'D' or suffix 'R' or 'Y' is included in the classification, this indicates that the results should be treated with caution. An explanation of the reason for the prefix and suffixes is given in Appendix 2, together with the classification limits specified in the Standard.

**Applicability of test result** The test results relate only to the behaviour of the test specimens of the 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.

### 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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## Appendix 1 – Test Results

| SPECIMEN No.                                   | 1  | 2     | 3     | 4    | 5    | 6    |
|--|--|-------|-------|------|------|------|
| Maximum distance travelled at 1.5 minutes (mm) | 60   | 60    | 60    | 60   | 60   | 60   |
| Distance (mm)                                  | Time to travel to indicated distance (minutes : seconds) |       |       |      |      |      |
| 75   |  | 6:39  | 7:48  |      |      |      |
| 165  |  |       |       |      |      |      |
| 190  |  |       |       |      |      |      |
| 215  |  |       |       |      |      |      |
| 240  |  |       |       |      |      |      |
| 265  |  |       |       |      |      |      |
| 290  |  |       |       |      |      |      |
| 375  |  |       |       |      |      |      |
| 455  |  |       |       |      |      |      |
| 500  |  |       |       |      |      |      |
| 525  |  |       |       |      |      |      |
| 600  |  |       |       |      |      |      |
| 675  |  |       |       |      |      |      |
| 710  |  |       |       |      |      |      |
| 750  |  |       |       |      |      |      |
| 785  |  |       |       |      |      |      |
| 825  |  |       |       |      |      |      |
| Time to reach maximum distance travelled       | 1:00   | 10:00 | 10:00 | 1:00 | 1:00 | 1:00 |
| Maximum distance travelled in 10 minutes (mm)  | 60   | 140   | 140   | 60   | 60   | 60   |

Note: Six specimens are usually tested. If the test on any specimen is deemed to be invalid, as defined in the Standard, it is permissible for up to a maximum of nine specimens to be tested in order to obtain the six valid test results.

### Observations made during test and comments on any difficulties encountered during the test:

In the case of specimen 2, sustained flaming occurred above the reference line at 6:15 extending to a distance of 165mm.

In the case of specimen 3, re-ignition occurred above the reference line at 7:50 extending to distance 250mm.

## Appendix 2 – Classification criteria

| Classification of spread of flame | Spread of Flame at 1.5 min |                             | Final Spread of Flame |                             |
|-----------------------------------|----------------------------|-----------------------------|-----------------------|-----------------------------|
|                                   | Limit (mm)                 | Limit for one specimen (mm) | Limit (mm)            | Limit for one specimen (mm) |
| Class 1                           | 165                        | 165 + 25                    | 165                   | 165 + 25                    |
| Class 2                           | 215                        | 215 + 25                    | 455                   | 455 + 45                    |
| Class 3                           | 265                        | 265 + 25                    | 710                   | 710 + 75                    |

Class 4 Exceeding the limits for class 3

### Explanation of prefix and suffixes which may be added to the classification

1. A suffix R is added to the classification if more than six specimens are required in order to obtain six valid test results (e.g. class 2R).
2. A prefix D is added to the classification of any product which does not comply with the surface characteristics specified in the Standard and has therefore been tested in a modified form (e.g. class D3).
3. A suffix Y is added to the classification if any softening and/or other behaviour that may affect the flame spread occurs (e.g. class 3Y).

For example, a classification of D3RY could be achieved indicating (a) a modified surface has been used; (b) a class 3 result has been obtained; (c) additional specimens have been used to obtain 6 valid results and; (d) softening and/or other behaviour has occurred which is considered to have affected the test result.

## Revision History

|   |   |
|---|---|
| Issue No : 2  | Re-issue Date: 4 <sup>th</sup> April 2013 |
| Revised By: C. Meachin  | Approved By: M. Dale                      |
| Reason for Revision: This document replaces issue 1 (dated 25 <sup>th</sup> February 2013) of the same number which has been withdrawn. The product reference of the composite has been changed at the request of the sponsor. The product reference has been amended in this issue 2 report. |   |

|                      |                |
|----------------------|----------------|
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| Revised By:          | Approved By:   |
| Reason for Revision: |                |