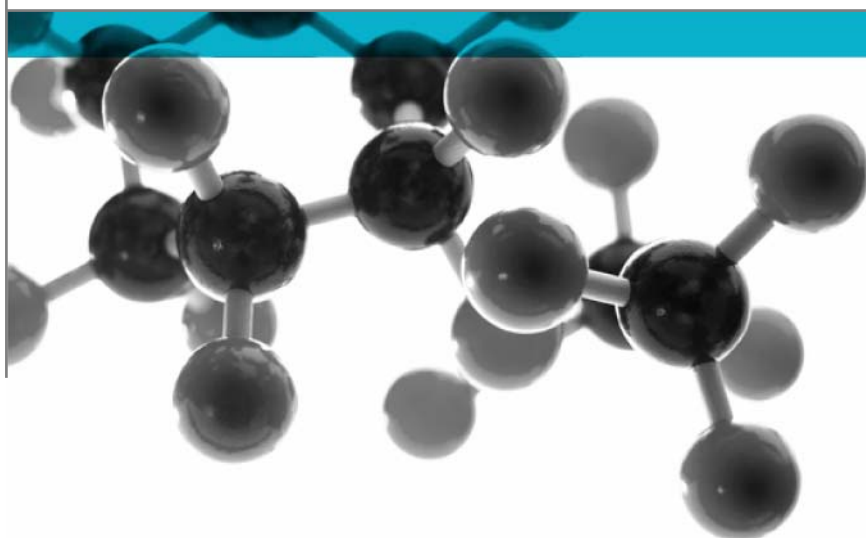


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BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: GRP Building Products Limited

Document Reference: 320303

Date: 17th July 2012

Issue No.: 1

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.

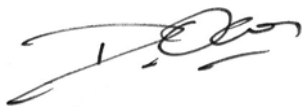

| Generic Description | Product reference | Thickness | Weight per unit area |
|---|--------------------------------|-------------------|--------------------------|
| Flame retardant grade glass fibre reinforced (GRP) laminate | "Brick Effect Cladding" | 9mm | 5.5kg/m ² |
| Individual components used to manufacture composite: | | | |
| Gel-coat | "Neogel 5000-1-1 Firestop" | 500microns | Not stated |
| Resin | "33-55-w-3" | Unable to provide | Not stated |
| Fibre reinforcement | "Owens corningm534-600-0-201B" | Not stated | 600g /m ² x 2 |
| Please see page 5 of this test report for the full description of the product tested | | | |

Test Sponsor GRP Building Products Limited, Unit 2a Ham Lane, Kingswinford, West Midlands DY6 7JU

Test Results: **Class 1**

Date of Test 12th and 16th July 2012

Signatories

| | |
|---|--|
|  |  |
| Responsible Officer D. J. Owen * Senior Technical Officer | Authorised T. Mort * Senior Technical Officer |

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

Report Issued: 17th July 2012

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| CONTENTS | PAGE NO. |
|---|-----------------|
| EXECUTIVE SUMMARY | 2 |
| SIGNATORIES..... | 2 |
| TEST DETAILS..... | 4 |
| DESCRIPTION OF TEST SPECIMENS..... | 5 |
| TEST RESULTS | 6 |
| APPENDIX 1 – TEST RESULTS | 7 |
| APPENDIX 2 – CLASSIFICATION CRITERIA | 8 |
| REVISION HISTORY | 9 |



Test Details

| | |
|--|---|
| Purpose of test | 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. |
| Scope of test | 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. |
| 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 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. |
| Instruction to test | The test was conducted on the 12 th and 16 th July 2012 at the request of GRP Building Products Limited, the sponsor of the test. |
| Provision of test specimens | The specimens were supplied by the sponsor of the test. Exova Warringtonfire was not involved in any selection or sampling procedure. |
| Conditioning of specimens | The specimens were received on the 10 th July 2012 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. |
| Form in which the specimens were tested | 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. |
| Exposed face | The decorative face of the specimens was exposed to the heating conditions of the test. |

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 | | Flame retardant grade glass fibre reinforced (GRP) laminate | |
| Product reference | | "Brick Effect Cladding" | |
| Name of manufacturer | | GRP Building Products | |
| Colour | | "Off white" | |
| Overall thickness | | 9mm (stated by sponsor) 7.5mm (determined by Exova Warringtonfire) | |
| Overall weight per unit area | | 5.5kg/m ² (stated by sponsor) 10.91kg/m ² (determined by Exova Warringtonfire) | |
| Moulded Sheet | Gel-coat | Generic type | Polyester |
| | | Product reference | "Neogel 5000-1-1 Firestop" |
| | | Name of manufacturer | Buffa |
| | | Colour | "Off White" |
| | | Application thickness | 500microns |
| | | Application method | brush |
| | | Flame retardant details | See Note 1 Below |
| | Resin | Generic type | Polyester |
| | | Product reference | "33-55-w-3" |
| | | Name of manufacturer | Bufa |
| | | Specific gravity/density | See Note 1 Below |
| | | Flame retardant details | See Note 1 Below |
| | Fibre reinforcement | Generic type | E-Glass |
| | | Product reference | "Owens corningm534-600-0-201B" |
| | | Number of layers | Two |
| | | Weight per unit area of each layer | 600g/m ² |
| | | Configuration of glass reinforcement | random |
| | | Name of manufacturer | Owens Corning |
| | Resin to glass ratio (by weight) | | 2.5:1 |
| | Percentage glass reinforcement (by weight) | | 30% |
| | Curing process (duration and temperature) | | 3 days air cure / 3 hours @ 80 Celsius |
| Brief description of manufacturing process | | Apply firestop gel coat with a brush apply two layers 600gm ² chopped strand mat impregnated with 3355-w-3 resin. Consolidate using roller and brush. Trim to size using diamond tipped cutting tools then post cure in oven at 80° Celsius. | |

Note 1: The sponsor was unable to provide this information.

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) | 55 | 60 | 60 | 60 | 60 | 60 |

| Distance (mm) | Time to travel to indicated distance (minutes : seconds) | | | | | |
|---|--|------|------|------|------|------|
| 75 | | | | | | |
| 165 | | | | | | |
| 190 | | | | | | |
| 215 | | | | | | |
| 240 | | | | | | |
| 265 | | | | | | |
| 290 | | | | | | |
| 375 | | | | | | |
| 455 | | | | | | |
| 500 | | | | | | |
| 525 | | | | | | |
| 600 | | | | | | |
| 675 | | | | | | |
| 710 | | | | | | |
| 750 | | | | | | |
| 785 | | | | | | |
| 825 | | | | | | |
| Time to reach maximum distance travelled | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 |
| Maximum distance travelled in 10 minutes (mm) | 55 | 60 | 60 | 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 each specimen transitory flaming occurred from 4:20 reaching up to a maximum distance of 190mm.

Document No.: 320303

Page No.: 7 of 9

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0249

Appendix 2 – Classification criteria

| Classification spread of flame | of | Spread of Flame at 1.5 min | | Final Spread of Flame | | |
|-----------------------------------|----|----------------------------|---------------|-----------------------------------|---------------|-----------------------------------|
| | | Classification | 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 |

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

Class 4 Exceeding the limits for class 3

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 : | Re-issue Date: |
| Revised By: | Approved By: |
| Reason for Revision: | |

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