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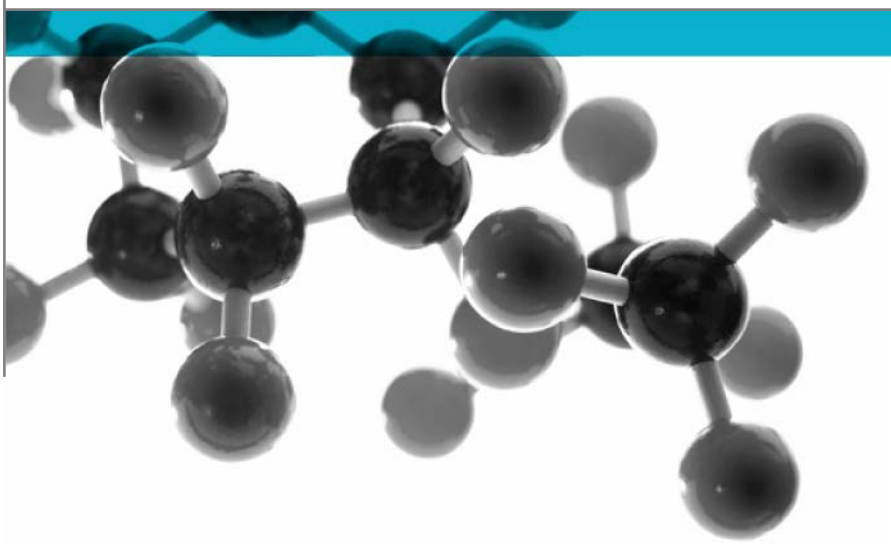
BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Abet Ltd

Document Reference: 361355

Date: 24th February 2016

Issue No.: 1

Testing
Advising
Assuring

UKAS TESTING
0249

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 / application rate	Weight per unit area / density / specific gravity
Coated standard grade compact laminate		"1104 -2-Décor"	3.0mm	1.43g/cm^3
Individual components used to manufacture composite:				
Coating (test / reverse face)		Unwilling to provide	Unwilling to provide	Unwilling to provide
Facing / Backing	Paper	"1104"	0.18±0.02mm	275 - 285g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Core	Paper	Unwilling to provide	0.17mm	268 - 275g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Please see pages 5, 6 & 7 of this test report for the full description of the product tested				

Test Sponsor Abet Ltd, 70 Roding Road, London Industrial Estate, E6 6LS.

Test Results: **Class 2**

Date of Test 3rd February 2016

Signatories

Responsible Officer C. Meachin * Technical Officer	Authorised T. Mort * Senior Technical Officer

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

Report Issued: 24th February 2016

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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 3rd February 2016 at the request of Abet Ltd, 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 27th January 2016 and were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 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

One of two identical faces 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			Coated standard grade compact laminate
Product reference			"1104 -2-Décor"
Name of manufacturer			Abet Laminati SpA
Thickness			3.0mm (stated by sponsor) 3.0mm (determined by **Exova Warringtonfire**)
Density			1.43g/cm³ (stated by sponsor) 1.46g/cm³ (determined by **Exova Warringtonfire**)
Coating (test face)		Generic type	Melamine resin
		Product reference	**See Note 1 Below**
		Name of manufacturer	**See Note 1 Below**
		Colour reference	"Clear"
		Number of coats	**See Note 1 Below**
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Lay-up
		Curing process per coat	Polymerisation 9mPa 150°C
		Flame retardant details	**See Note 2 Below**
High pressure laminate	Product reference		"1104-2—Decorative"
	Name of manufacturer		Abet Laminati SpA
	Thickness		3.0mm
	Density		1.43g/cm³
	Facings – Paper	Generic type	Décor paper
		Product reference	"1104"
		Name of manufacturer	**See Note 1 Below**
		Thickness	0.18±0.02mm
		Density	275 - 285g/cm³
		Colour reference	"1104"
		Flame retardant details	**See Note 2 Below**
	Facings – Resin	Generic type	Melaminic
		Product reference	The sponsor has confirmed that no specific reference is used for this component
		Name of manufacturer	**See Note 1 Below**
		Colour reference	**See Note 1 Below**
		Number of coats	1 overlay
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Impregnation
		Flame retardant details	**See Note 2 Below**

Continued on next page

	Core	Paper	Generic type	Kraft
			Product reference	**See Note 1 Below**
			Detailed description	Wood pulp
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.17mm
			Density	268 - 275g/cm³
			Colour reference	“BK”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Phenolic resin
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	“Clear”
			Number of coats	1 layer
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Reverse face	Paper	Generic type	Décor paper
			Product reference	“1104”
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.18±0.02mm
			Density	275 - 285g/cm³
			Colour reference	“1104”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Melaminic
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	**See Note 1 Below**
			Number of coats	1 overlay
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Press details			Pressed 9mpa at150°C

Continued on next page

Coating (back face)	Generic type	Melamine resin
	Product reference	**See Note 1 Below**
	Name of manufacturer	**See Note 1 Below**
	Colour reference	"Clear"
	Number of coats	**See Note 1 Below**
	Application thickness per coat	**See Note 1 Below**
	Specific gravity	**See Note 1 Below**
	Application method	Lay-up
	Curing process per coat	Polymerisation 9mPa 150°C
	Flame retardant details	**See Note 2 Below**
Brief description of manufacturing process		Material consisting of layers of kraft paper impregnated with thermosetting resins and an outer layer on both sides of decorative paper impregnated with aminoplastic resins; All bonded together by means of high pressure (9 MPa) and heat (150 °C)

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

Note 2: The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

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 2.

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.

Appendix 1 – Test Results

SPECIMEN No.	1	2	3	4	5	6
Maximum distance travelled at 1.5 minutes (mm)	<50	55	<50	60	55	55
Distance (mm)	Time to travel to indicated distance (minutes : seconds)					
75	4:39	3:17	4:17	3:36	3:48	2:35
165	7:27	3:34	8:30		7:05	
190	9:16	3:47				
215		6:12				
240						
265						
290						
375						
455						
500						
525						
600						
675						
710						
750						
785						
825						
Time to reach maximum distance travelled	10:00	10:00	10:00	10:00	7:05	10:00
Maximum distance travelled in 10 minutes (mm)	210	235	170	155	165	155

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 tested all sustained flaming ceased after 1:00.

In the case of specimen 1, re-ignition occurred above the reference line at 2:40, extending down to the reference line at 4:39.

In the case of specimens 2, 3, 4, 5 and 6 re-ignition occurred on the reference line at 1:48, 2:38, 2:14, 2:26 and 1:50 respectively.

Appendix 2 – Classification criteria

Classification of spread of flame

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

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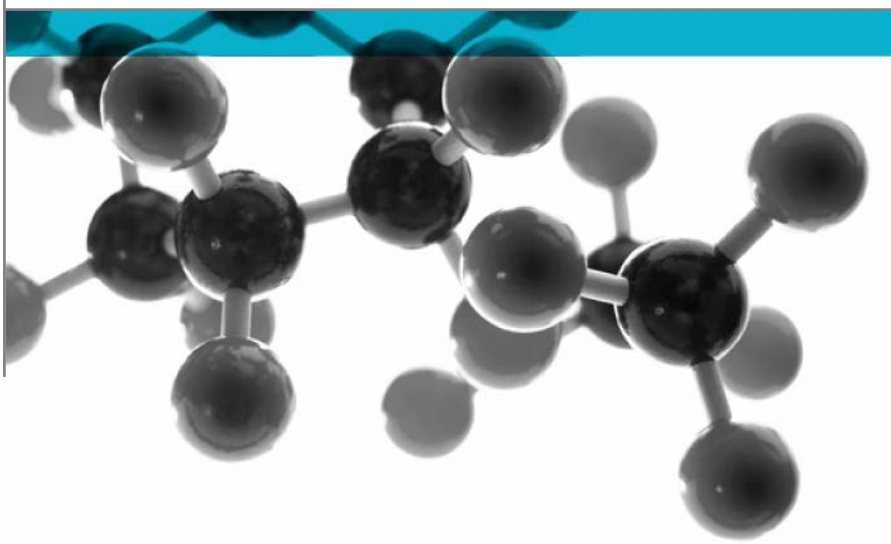
BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Abet Ltd

Document Reference: 361357

Date: 24th February 2016

Issue No.: 1

Testing
Advising
Assuring

UKAS TESTING
0249

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 / application rate	Weight per unit area / density / specific gravity
Coated standard grade compact laminate		"1104 -2-Décor"	4.0mm	1.43g/cm^3
Individual components used to manufacture composite:				
Coating (test / reverse face)		Unwilling to provide	Unwilling to provide	Unwilling to provide
Facing / Backing	Paper	"1104"	0.18±0.02mm	275 - 285g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Core	Paper	Unwilling to provide	0.17mm	268 - 275g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Please see pages 5, 6 & 7 of this test report for the full description of the product tested				

Test Sponsor Abet Ltd, 70 Roding Road, London Industrial Estate, E6 6LS.

Test Results: **Class 2**

Date of Test 3rd February 2016

Signatories

Responsible Officer C. Meachin * Technical Officer	Authorised T. Mort * Senior Technical Officer

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

Report Issued: 24th February 2016

CONTENTS **PAGE NO.**

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 3rd February 2016 at the request of Abet Ltd, 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 27th January 2016 and were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 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

One of two identical faces 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			Coated standard grade compact laminate
Product reference			"1104 -2-Décor"
Name of manufacturer			Abet Laminati SpA
Thickness			4.0mm (stated by sponsor) 3.93mm (determined by **Exova Warringtonfire**)
Density			1.43g/cm³ (stated by sponsor) 1.27g/cm³ (determined by **Exova Warringtonfire**)
Coating (test face)		Generic type	Melamine resin
		Product reference	**See Note 1 Below**
		Name of manufacturer	**See Note 1 Below**
		Colour reference	"Clear"
		Number of coats	**See Note 1 Below**
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Lay-up
		Curing process per coat	Polymerisation 9mPa 150°C
		Flame retardant details	**See Note 2 Below**
High pressure laminate	Product reference		"1104-2—Decorative"
	Name of manufacturer		Abet Laminati SpA
	Thickness		4.0mm
	Density		1.43g/cm³
	Facings: Paper	Generic type	Décor paper
		Product reference	"1104"
		Name of manufacturer	**See Note 1 Below**
		Thickness	0.18±0.02mm
		Density	275 - 285g/cm³
		Colour reference	"1104"
		Flame retardant details	**See Note 2 Below**
	Facings: Resin	Generic type	Melaminic
		Product reference	The sponsor has confirmed that no specific reference is used for this component
		Name of manufacturer	**See Note 1 Below**
		Colour reference	**See Note 1 Below**
		Number of coats	1 overlay
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Impregnation
		Flame retardant details	**See Note 2 Below**

Continued on next page

	Core	Paper	Generic type	Kraft
			Product reference	**See Note 1 Below**
			Detailed description	Wood pulp
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.17mm
			Density	268 - 275g/cm³
			Colour reference	“BK”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Phenolic resin
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	“Clear”
			Number of coats	1 layer
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Reverse face	Paper	Generic type	Décor paper
			Product reference	“1104”
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.18±0.02mm
			Density	275 - 285g/cm³
			Colour reference	“1104”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Melaminic
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	**See Note 1 Below**
			Number of coats	1 overlay
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Press details			Pressed 9mpa at150°C

Continued on next page

Coating (back face)	Generic type	Melamine resin
	Product reference	**See Note 1 Below**
	Name of manufacturer	**See Note 1 Below**
	Colour reference	"Clear"
	Number of coats	**See Note 1 Below**
	Application thickness per coat	**See Note 1 Below**
	Specific gravity	**See Note 1 Below**
	Application method	Lay-up
	Curing process per coat	Polymerisation 9mPa 150°C
	Flame retardant details	**See Note 2 Below**
Brief description of manufacturing process		Material consisting of layers of kraft paper impregnated with thermosetting resins and an outer layer on both sides of decorative paper impregnated with aminoplastic resins; All bonded together by means of high pressure (9 MPa) and heat (150 °C)

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

Note 2: The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

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 2.

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.

Appendix 1 – Test Results

SPECIMEN No.	1	2	3	4	5	6
Maximum distance travelled at 1.5 minutes (mm)	<50	<50	<50	55	<50	<50
Distance (mm)	Time to travel to indicated distance (minutes : seconds)					
75	3:27	4:39	5:18	4:52	3:54	4:20
165		5:31	5:34	6:33	4:52	5:18
190					5:14	
215						
240						
265						
290						
375						
455						
500						
525						
600						
675						
710						
750						
785						
825						
Time to reach maximum distance travelled	6:00	5:31	5:54	7:15	5:14	5:18
Maximum distance travelled in 10 minutes (mm)	140	165	175	185	190	165

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 tested all sustained flaming ceased after 1:00. Re-ignition occurred at 2:08, 2:10, 2:34, 2:50, 2:12, 2:30 respectively.

Appendix 2 – Classification criteria

Classification of spread of flame

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

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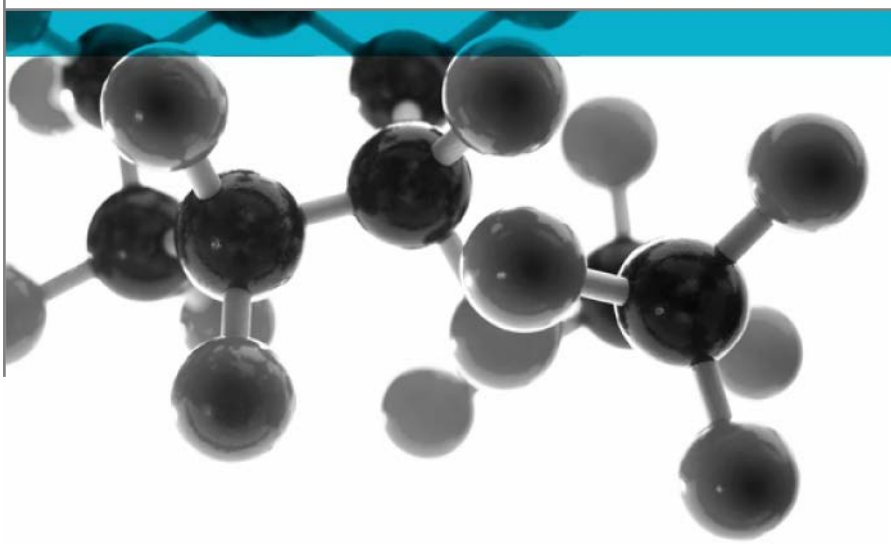
BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Abet Ltd

Document Reference: 361358

Date: 24th February 2016

Issue No.: 1

Testing
Advising
Assuring

UKAS TESTING
0249

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 / application rate	Weight per unit area / density / specific gravity
Coated standard grade compact laminate		"1104 -2-Décor"	2.0mm	1.43g/cm^3
Individual components used to manufacture composite:				
Coating (test / reverse face)		Unwilling to provide	Unwilling to provide	Unwilling to provide
Facing / Backing	Paper	"1104"	0.18±0.02mm	275 - 285g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Core	Paper	Unwilling to provide	0.17mm	268 - 275g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Please see pages 5, 6 & 7 of this test report for the full description of the product tested				

Test Sponsor Abet Ltd, 70 Roding Road, London Industrial Estate, E6 6LS.

Test Results: **Class 2**

Date of Test 5th February 2016

Signatories

Responsible Officer C. Meachin * Technical Officer	Authorised T. Mort * Senior Technical Officer

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

Report Issued: 24th February 2016

CONTENTS **PAGE NO.**

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 5th February 2016 at the request of Abet Ltd, 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 27th January 2016 and were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 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

One of two identical faces 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			Coated standard grade compact laminate
Product reference			"1104 -2-Décor"
Name of manufacturer			Abet Laminati SpA
Thickness			2.0mm (stated by sponsor) 2.43mm (determined by **Exova Warringtonfire**)
Density			1.43g/cm³ (stated by sponsor) 1.30g/cm³ (determined by **Exova Warringtonfire**)
Coating (test face)		Generic type	Melamine resin
		Product reference	**See Note 1 Below**
		Name of manufacturer	**See Note 1 Below**
		Colour reference	"Clear"
		Number of coats	**See Note 1 Below**
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Lay-up
		Curing process per coat	Polymerisation 9mPa 150°C
		Flame retardant details	**See Note 2 Below**
High pressure laminate	Product reference		"1104-2—Decorative"
	Name of manufacturer		Abet Laminati SpA
	Thickness		2.0mm
	Density		1.43g/cm³
	Facings – Paper	Generic type	Décor paper
		Product reference	"1104"
		Name of manufacturer	**See Note 1 Below**
		Thickness	0.18±0.02mm
		Density	275 - 285g/cm³
		Colour reference	"1104"
		Flame retardant details	**See Note 2 Below**
	Facings – Resin	Generic type	Melaminic
		Product reference	The sponsor has confirmed that no specific reference is used for this component
		Name of manufacturer	**See Note 1 Below**
		Colour reference	**See Note 1 Below**
		Number of coats	1 overlay
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Impregnation
		Flame retardant details	**See Note 2 Below**

Continued on next page

	Core	Paper	Generic type	Kraft
			Product reference	**See Note 1 Below**
			Detailed description	Wood pulp
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.17mm
			Density	268 - 275g/cm³
			Colour reference	“BK”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Phenolic resin
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	“Clear”
			Number of coats	1 layer
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Reverse face	Paper	Generic type	Décor paper
			Product reference	“1104”
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.18±0.02mm
			Density	275 - 285g/cm³
			Colour reference	“1104”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Melaminic
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	**See Note 1 Below**
			Number of coats	1 overlay
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Press details			Pressed 9mpa at150°C

Continued on next page

Coating (back face)	Generic type	Melamine resin
	Product reference	**See Note 1 Below**
	Name of manufacturer	**See Note 1 Below**
	Colour reference	"Clear"
	Number of coats	**See Note 1 Below**
	Application thickness per coat	**See Note 1 Below**
	Specific gravity	**See Note 1 Below**
	Application method	Lay-up
	Curing process per coat	Polymerisation 9mPa 150°C
	Flame retardant details	**See Note 2 Below**
Brief description of manufacturing process		Material consisting of layers of kraft paper impregnated with thermosetting resins and an outer layer on both sides of decorative paper impregnated with aminoplastic resins; All bonded together by means of high pressure (9 MPa) and heat (150 °C)

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

Note 2: The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

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 2.

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.

Appendix 1 – Test Results

SPECIMEN No.	1	2	3	4	5	6
Maximum distance travelled at 1.5 minutes (mm)	65	60	60	60	75	65
Distance (mm)	Time to travel to indicated distance (minutes : seconds)					
75	2:21	2:12	3:34	2:10	2:53	2:01
165	4:10	--:--	--:--	3:20	5:03	2:24
190		6:39	--:--	5:36		--:--
215			4:17			--:--
240						7:42
265						
290						
375						
455						
500						
525						
600						
675						
710						
750						
785						
825						
Time to reach maximum distance travelled	4:10	6:43	4:17	5:36	5:42	7:56
Maximum distance travelled in 10 minutes (mm)	165	195	215	190	185	255

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 1 all sustained flaming ceased after 1:00. Re-ignition occurred above the reference line at 1:24 at a distance of 150mm, the sustained flame front extended down to the reference line at 2:21. Sustained flaming occurred at the top of the specimen at 5:19 extending up to a maximum distance of 210mm.

In the case of specimens 2, 3, 4, 5 and 6 sustained flaming continued above the reference line from 1:00, extending down to the reference line at 2:12, 3:34, 2:10, 2:53 and 2:01 respectively.

Appendix 2 – Classification criteria

Classification of spread of flame

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

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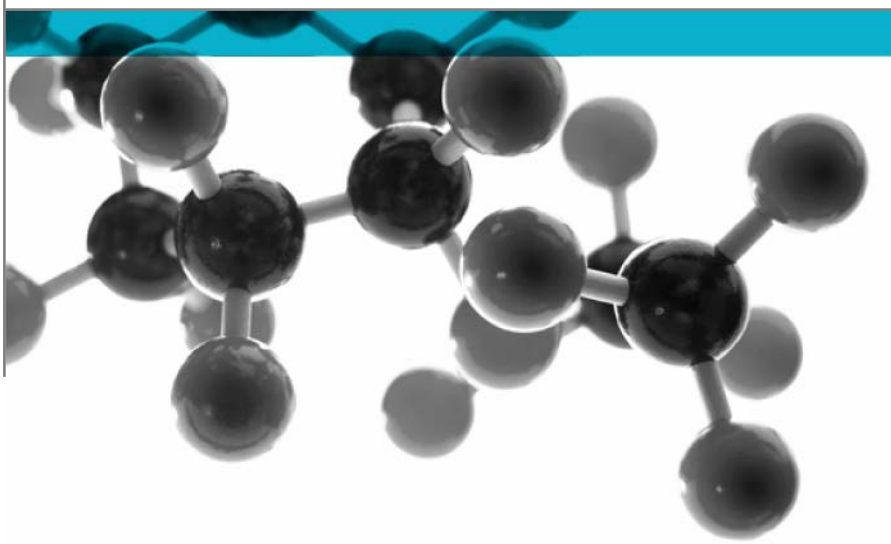

Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Abet Ltd

Document Reference: 361354

Date: 24th February 2016

Issue No.: 1

Testing
Advising
Assuring

UKAS TESTING
0249

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 / application rate	Weight per unit area / density / specific gravity
Coated standard grade compact laminate		"1104 -2-Décor"	1.5mm	1.43g/cm^3
Individual components used to manufacture composite:				
Coating (test / reverse face)		Unwilling to provide	Unwilling to provide	Unwilling to provide
Facing / Backing	Paper	"1104"	0.18±0.02mm	275 - 285g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Core	Paper	Unwilling to provide	0.17mm	268 - 275g/cm^3
	Resin	No specific product reference	Unwilling to provide	Unwilling to provide
Please see pages 5, 6 & 7 of this test report for the full description of the product tested				

Test Sponsor Abet Ltd, 70 Roding Road, London Industrial Estate, E6 6LS.

Test Results: **Class 1**

Date of Test 5th February 2016

Signatories

C Meachin	T Mort
Responsible Officer C. Meachin * Technical Officer	Authorised T. Mort * Senior Technical Officer

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

Report Issued: 24th February 2016

CONTENTS **PAGE NO.**

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 5th February 2016 at the request of Abet Ltd, 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 27th January 2016 and were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 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

One of two identical faces 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			Coated standard grade compact laminate
Product reference			"1104 -2-Décor"
Name of manufacturer			Abet Laminati SpA
Thickness			1.5mm (stated by sponsor) 1.35mm (determined by **Exova Warringtonfire**)
Density			1.43g/cm³ (stated by sponsor) 1.56g/cm³ (determined by **Exova Warringtonfire**)
Coating (test face)		Generic type	Melamine resin
		Product reference	**See Note 1 Below**
		Name of manufacturer	**See Note 1 Below**
		Colour reference	"Clear"
		Number of coats	**See Note 1 Below**
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Lay-up
		Curing process per coat	Polymerisation 9mPa 150°C
		Flame retardant details	**See Note 2 Below**
High pressure laminate	Product reference		"1104-2—Decorative"
	Name of manufacturer		Abet Laminati SpA
	Thickness		1.5mm
	Density		1.43g/cm³
	Facings: Paper	Generic type	Décor paper
		Product reference	"1104"
		Name of manufacturer	**See Note 1 Below**
		Thickness	0.18±0.02mm
		Density	275 - 285g/cm³
		Colour reference	"1104"
		Flame retardant details	**See Note 2 Below**
	Facings: Resin	Generic type	Melaminic
		Product reference	The sponsor has confirmed that no specific reference is used for this component
		Name of manufacturer	**See Note 1 Below**
		Colour reference	**See Note 1 Below**
		Number of coats	1 overlay
		Application thickness per coat	**See Note 1 Below**
		Specific gravity	**See Note 1 Below**
		Application method	Impregnation
		Flame retardant details	**See Note 2 Below**

Continued on next page

	Core	Paper	Generic type	Kraft
			Product reference	**See Note 1 Below**
			Detailed description	Wood pulp
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.17mm
			Density	268 - 275g/cm³
			Colour reference	“BK”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Phenolic resin
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	“Clear”
			Number of coats	1 layer
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Reverse face	Paper	Generic type	Décor paper
			Product reference	“1104”
			Name of manufacturer	**See Note 1 Below**
			Thickness	0.18±0.02mm
			Density	275 - 285g/cm³
			Colour reference	“1104”
			Flame retardant details	**See Note 2 Below**
		Resin	Generic type	Melaminic
			Product reference	The sponsor has confirmed that no specific reference is used for this component
			Name of manufacturer	**See Note 1 Below**
			Colour reference	**See Note 1 Below**
			Number of coats	1 overlay
			Application thickness per coat	**See Note 1 Below**
			Specific gravity	**See Note 1 Below**
			Application method	Impregnation
			Flame retardant details	**See Note 2 Below**
	Press details			Pressed 9mpa at150°C

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Coating (back face)	Generic type	Melamine resin
	Product reference	**See Note 1 Below**
	Name of manufacturer	**See Note 1 Below**
	Colour reference	"Clear"
	Number of coats	**See Note 1 Below**
	Application thickness per coat	**See Note 1 Below**
	Specific gravity	**See Note 1 Below**
	Application method	Lay-up
	Curing process per coat	Polymerisation 9mPa 150°C
	Flame retardant details	**See Note 2 Below**
Brief description of manufacturing process		Material consisting of layers of kraft paper impregnated with thermosetting resins and an outer layer on both sides of decorative paper impregnated with aminoplastic resins; All bonded together by means of high pressure (9 MPa) and heat (150 °C)

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

Note 2: The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

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.

Appendix 1 – Test Results

SPECIMEN No.	1	2	3	4	5	6
Maximum distance travelled at 1.5 minutes (mm)	70	60	80	60	70	65
Distance (mm)	Time to travel to indicated distance (minutes : seconds)					
75	--:--	--:--	0:51			2:03
165	3:24	3:47				
190						
215						
240						
265						
290						
375						
455						
500						
525						
600						
675						
710						
750						
785						
825						
Time to reach maximum distance travelled	3:24	3:50	0:56	0:43	0:55	2:03
Maximum distance travelled in 10 minutes (mm)	165	170	80	60	70	75

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 1 sustained flaming continued above the reference line until 1:06 extending up to a maximum distance of 85mm. Re-ignition occurred above the reference line at 1:35 at a distance of 145mm.
In the case of specimen 2 transitory flaming occurred above the reference from 1:00 extending up to a maximum distance of 75mm at 2:30. Sustained flaming occurred above the reference line at 2:30 extending up to a maximum distance of 165mm.
In the case of specimen 3 re-ignition occurred at the top of the specimen at 1:40 extending up to a maximum distance of 90mm. Transitory flaming occurred at the top of the specimen from 2:52 extending up to a maximum distance of 90mm at 4:18.
In the case of specimens 4, 5 and 6 re-ignition occurred above the line at 3:24, 1:57 and 1:43 extending up a maximum distance of 160mm, 150mm and 160mm respectively.

Appendix 2 – Classification criteria

Classification of spread of flame

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