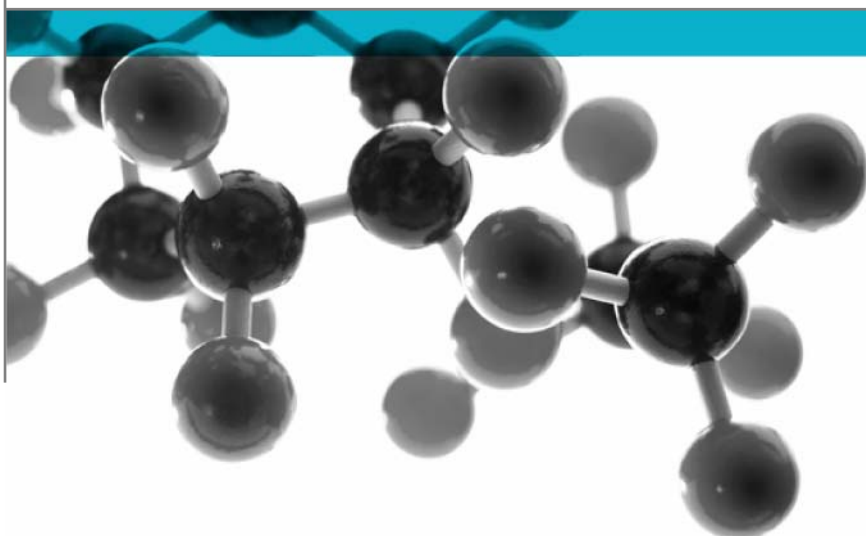


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BS 6853: 1999: Annex D.8.6



Methods For Measuring Smoke Density – Flooring test

A Report To: Applied Media

Document Reference: 317887

Date: 26th April 2012

Issue No.: 1

Page 1

Testing
Advising
Assuring



Executive Summary

Objective To determine the smoke density of the following product when tested in accordance with BS 6853: 1999 incorporating amendment No. 1 Annex D.8.6

Generic Description	Product reference	Thickness	Weight per unit area or density
Self-adhesive printed floor graphic material applied to one face of a fibre cement board substrate	"Applied Media"	7.68mm*	12.99kg/m ² *
Individual components used to manufacture composite:			
Self-adhesive floor graphic	"Applied Media"	1.8mm	3.5kg/m ²
Fibre cement board substrate	"NT D4 604"	6mm	1900±200kg/m ³
* determined by Exova Warringtonfire			
Please see page 6 of this test report for the full description of the product tested			


Test Sponsor Applied Media, 7 Brock Way, Knutton, Newcastle under Lyme, Staffordshire, ST5 6AZ

Test Results:


	Specimen No. 1	Specimen No. 2	Average
A ₀ (max)	175	152	164

Date of Test 23rd April 2012

Signatories



Responsible Officer
T. Kinder *
Testing Officer



Authorised
T. Mort *
Senior Technical Officer

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

Report Issued: 26th April 2012

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Document No.: 317887

Author: T. Kinder

Client: W J Roadmarkings Ltd. T/A Applied Media

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Issue Date: 26th April 2012

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Test Details

Purpose of test	<p>To determine the performance of a specimen when it is subjected to the conditions of test specified in BS 6853: 1999, Incorporating Amendment No. 1, "Code of practice for fire precautions in the design and construction of passenger carrying trains" Annex D.8.6 "Flooring test".</p> <p>The test was performed in accordance with the procedure specified in BS 6853: 1999 Annex D, Incorporating Amendment No. 1, Clause D.8.6 and this report should be read in conjunction with that Standard.</p>
Scope of test	<p>BS 6853: 1989, Incorporating Amendment No. 1, Annex D.8.6 details a test procedure, the results being expressed as A_{O} (max), for the measurement of the density of smoke emitted from a flooring material burning under the defined conditions of test. The results are used to determine compliance with the criteria given in BS 6853: 1999 incorporating amendment No. 1, Tables 1 and 4 and the requirements specified in these tables are detailed in Appendix 2.</p>
Fire test study group/EGOLF	<p>Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and 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.</p>
Instruction to test	<p>The test was conducted on the 23rd April 2012 at the request of W J Roadmarkings Ltd. T/A Applied Media, the sponsor of the test.</p>
Provision of test specimens	<p>The specimens were supplied by the sponsor of the test. Exova Warringtonfire was not involved in any selection or sampling procedure.</p>
Conditioning of specimens	<p>The specimens were received on the 18th April 2012.</p> <p>The test specimens were conditioned by maintaining them in indoor ambient conditions for 72 hours and then for a minimum of 16 hours at $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$.</p>
Exposed face	<p>The decorative face of the specimens was exposed to the flame.</p>
Ignition source	<p>Fire source No. 2, charcoal, as detailed in clause D.4.3 was used</p>

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		Self-adhesive printed floor graphic material applied to one face of a fibre cement board substrate	
Overall thickness		7.58mm (determined by Exova Warringtonfire)	
Overall weight per unit area		13.11kg/m ² (determined by Exova Warringtonfire)	
Self-adhesive floor graphic	Product reference	"Applied Media"	
	Thickness	1.8mm	
	Weight per unit area	3.5kg/m ²	
	Name of manufacturer	W J Roadmarkings Limited t/a Applied Media	
	Soda glass granules	Product reference	"100% Soda Glass Aggregate"
		Generic type	Soda glass granules
		Name of manufacturer	See Note 1 below
		Application thickness	See Note 1 below
		Weight per unit area	See Note 1 below
		Colour	"Transparent"
	Surface coating	Flame retardant details	See Note 2 below
		Product reference	"PU Acrylic Laminate"
		Generic type	PU acrylic laminate
		Name of manufacturer	See Note 1 below
		Number of coats	See Note 1 below
		Application rate / thickness per coat	See Note 1 below
	Printing	Colour	"Transparent"
		Flame retardant details	See Note 2 below
		Product reference	"Solvent Ink"
		Generic type	Inkjet solvent
		Name of manufacturer	See Note 3 below
		Weight per unit area	See Note 3 below
	Polymeric base	Thickness	See Note 3 below
		Colour	See Note 3 below
		Flame retardant details	See Note 2 below
		Product reference	"Polymeric Blend Media"
		Generic type	High quality blend of polymeric elastomers See Note 1 below
Name of manufacturer		See Note 1 below	
Adhesive backing	Weight per unit area	See Note 1 below	
	Thickness	See Note 1 below	
	Colour	"White"	
	Flame retardant details	See Note 2 below	
	Product reference	"Pressure Sensitive Adhesive System"	
	Generic type	Natural rubber	
	Name of manufacturer	See Note 3 below	
	Application rate	36g/m ²	
	Application method	Screed in manufacturing process	
	Flame retardant details	See Note 2 below	

Substrate	Trade name	"NT D4 604"
	Generic Description	Fibre cement board
	Supplier	Scheeders van de Kerkhove (SVK)
	Overall thickness	6mm
	Overall density	1900 ± 200kg/m ³
	Flame retardant details	The substrate is inherently flame retardant
Brief description of manufacturing process of the floor covering		Processed blend of polymers, coated base of adhesive, inkjet solvent print and top coated with PU acrylic and soda glass.

Note 1. The sponsor of the test was unwilling to provide this or further information.

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

Note 3. The sponsor of the test has provided this information but at the specific request of the sponsor, these details have been omitted from the report and are instead held on the confidential file relating to this investigation.

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

Applicability of test results of 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.

Test results

	Specimen No. 1	Specimen No. 2	Average
A _O (max)	175	152	164

Standard Deviation = 16.264

Visual observations made during the test are given in Appendix 1.

The changes in A_O with time and % transmittance with time were continuously recorded and graphs are presented in Figures 1 and 2.

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**Observations during test of Specimen 1**

- 00:01 Ignition of charcoal, test commenced.
- 12:38 The fire source flames reduced in intensity.
- 15:00 No change, the charcoal continued to flame.
- 19:12 All flaming ceased, the charcoal and specimen continued to smoulder.
- 30:00 No change, the charcoal and specimen continued to smoulder.
- 40:00 Test terminated.

Damaged area: 200mm Length x 200mm width x 2mm thickness

Observations during test of Specimen 2

- 00:01 Ignition of charcoal, test commenced.
- 03:30 The surface of the specimen ignited.
- 11:20 The flames on the surface of the specimen continued and the fire source flames reduced in intensity.
- 15:00 No change, the charcoal and specimen continued to flame.
- 19:28 All flaming ceased, the charcoal and specimen continued to smoulder.
- 30:00 No change, the charcoal and specimen continued to smoulder.
- 40:00 Test terminated.

Damaged area: 200mm Length x 200mm width x 2mm thickness

Appendix 2

Table 1 of BS 6853:1999 – Interior Horizontal Supine Surfaces

Test	Parameter	Pass / Fail Criteria		
		Vehicle Cat 1a	Vehicle Cat 1b	Vehicle Cat 2
BS 476 Part 7 OR BS ISO 9239-1	Worst permissible class	Class 2	Class 2	Class 2
	C.F.E (min)	7.5 kW/m ²	7.5 kW/m ²	7.5 kW/m ²
Annex D Smoke test	Ao (max.)	220	350	nc ^a
Annex B Toxicity test	R (max.)	5.0	8.0	18.0
nc: no criterion.				
^a The permissible level is outside the measuring range of the method. The value is so high that it has been decided not to offer a numerical criterion.				

Table 4 of BS 6853:1999 – Exterior Horizontal Supine Surfaces

Test	Parameter	Pass / Fail Criteria		
		Vehicle Cat 1a	Vehicle Cat 1b	Vehicle Cat 2
BS 476 Part 7 OR BS ISO 9239-1	Worst permissible class	Class 2	Class 2	Class 2
	C.F.E (min)	7.5 kW/m ²	7.5 kW/m ²	7.5 kW/m ²
Annex D Smoke test	Ao (max.)	370	590	nc
Annex B Toxicity test	R (max.)	8.5	13.5	nc
nc: no criterion.				

Figure 1

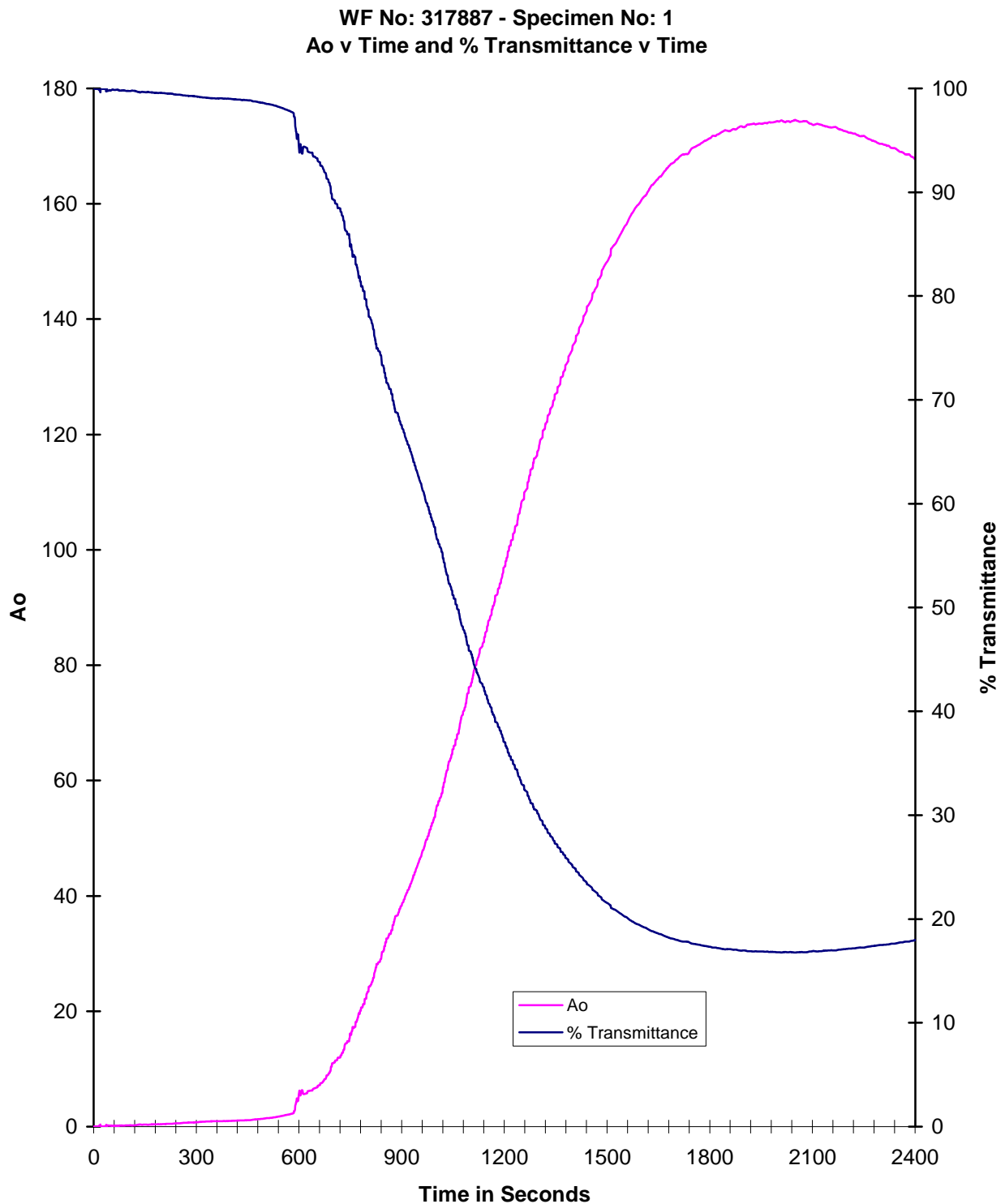
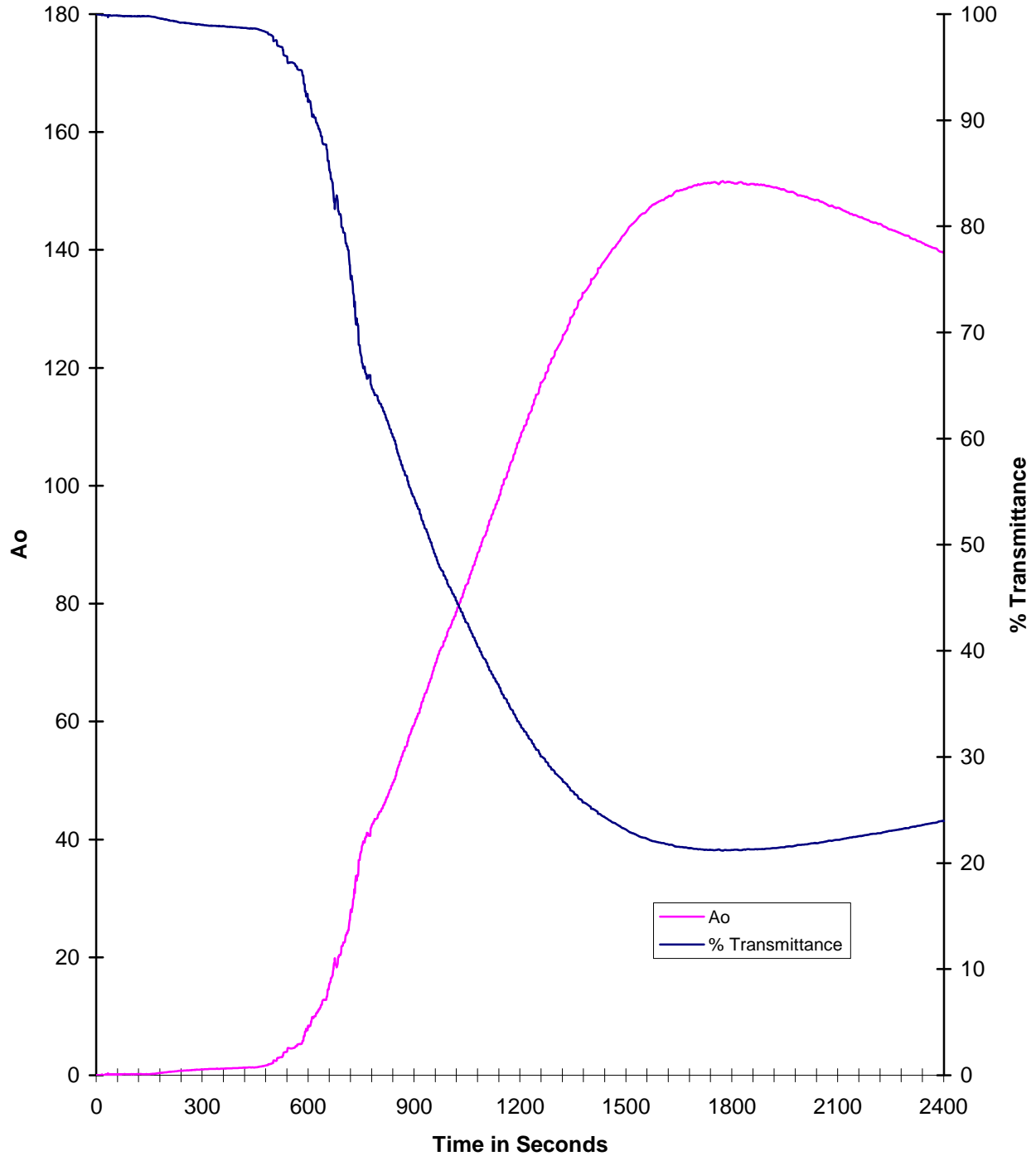


Figure 2

WF No: 317887 - Specimen No: 2
Ao v Time and % Transmittance v Time



Revision History

Issue No :	Issue Date:
Revised By:	Approved By:
Reason for Revision:	

Issue No :	Issue Date:
Revised By:	Approved By:
Reason for Revision:	