

TEST REPORT

WARRES NO. L12348

**BS 6853: 1987 APPENDIX B, CLAUSE B.5.2
FIRE PRECAUTIONS IN THE DESIGN AND
CONSTRUCTION OF RAILWAY PASSENGER
ROLLING STOCK
THREE METRE CUBE SMOKE EMISSION TEST**

SPONSORED BY

**SMYTH INTERNATIONAL B.V.
Edisonstraat 9c, 2723 RS Zoetermeer, The Netherlands**



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PURPOSE OF TEST

To determine the performance of a specimen of a coated panel when it is subjected to the conditions of test specified in BS 6853: 1987 "Fire precautions in the design and construction of railway passenger rolling stock", Appendix B, Clause B.5.2, "The 60° panel test".

SCOPE OF TEST

BS 6853: 1987 Appendix B, Clause B.5.2 details a test procedure, the results being expressed as Ao(on) and Ao(off) values, for the measurement of the density of smoke emitted from a panel burning under the defined conditions of test. The results are used to determine compliance with the criteria given in BS 6853: 1987 Table 1 "Recommended compliance for flammability and smoke emission testing".

DESCRIPTION OF TEST SPECIMEN

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

The product was a 3.5mm thick coated laminate referenced "Colour phenolic laminate".

The sponsor requested that details of composition of the product should not be included in the test report, however, composition details have been provided and are held in our confidential file relating to this investigation.

The specimen was supplied by the sponsor of the test on 17 March 1993. Warrington Fire Research Centre was not involved in any selection or sampling procedure..

DATE OF TEST

The test was performed on 10 April 1993.

TEST PROCEDURE

The test was performed in accordance with the procedure specified in BS 6853: Appendix B, Clause B.5.2 and this report should be read in conjunction with that Standard. Restraining clips were used to prevent excessive movement of the test specimen.

EXPOSED FACE

One coated face of the specimen was exposed to the flame.

TEST RESULTS

The test results relate only to the behaviour of the specimen of the product under the particular conditions of test; they are not intended to be the sole criterion for assessing the potential smoke hazard of the product in use.

The test results relate only to the specimen of the product in the form in which it was 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 specimen which was tested.

Ao values are calculated as follows:

$$A_o = A_m V / (nl)$$

Where

$$V = 27\text{m}^3 \text{ (volume of the cube)}$$

$$l = 3\text{m} \text{ (length of the optical path between windows)}$$

$$n = 1$$

All figures are rounded down to the second decimal place.

$$A_m(\text{on}) = 0.09 \qquad A_o(\text{on}) = 0.86$$

$$A_m(\text{off}) = 0.12 \qquad A_o(\text{off}) = 1.15$$

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

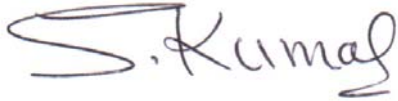
The changes in A_m and A_o with time were continuously recorded and graphs are presented in Figures 1 and 2.

Photographs of the specimen before and after the test are given in Plates 1 and 2.

CONCLUSION

The recommended compliance criteria for Category 1 panelling described as a “Thin coating on inert substrate” are $Ao(on) < 1.0$ and $Ao(off) < 1.5$. This specimen therefore meets this criteria.

Responsible Officer



S. Kumar
Manager - Standard Testing

Approved



pp R. J. SHAW
Director
for and on behalf of
WARRINGTON FIRE RESEARCH CENTRE

Date of issue: 6 May 1993

OBSERVATIONS DURING TEST

TIME (MINS-SEC)	OBSERVATIONS
1-20	Paint charred and falling off.
2-00	Panel delaminating.
25-20	Alcohol fuel consumed.

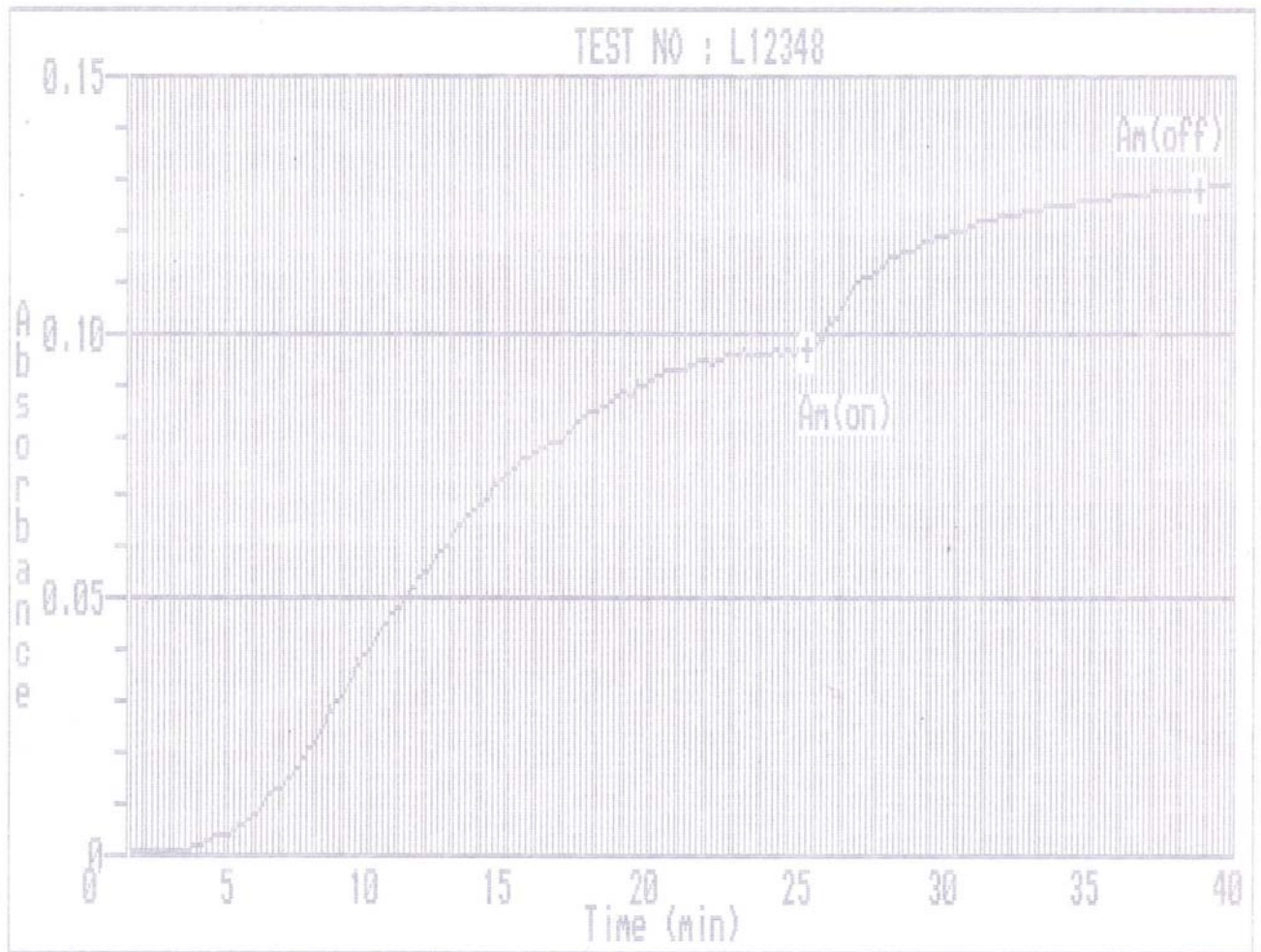


Figure 1 Variations of Absorbance (Am) with time

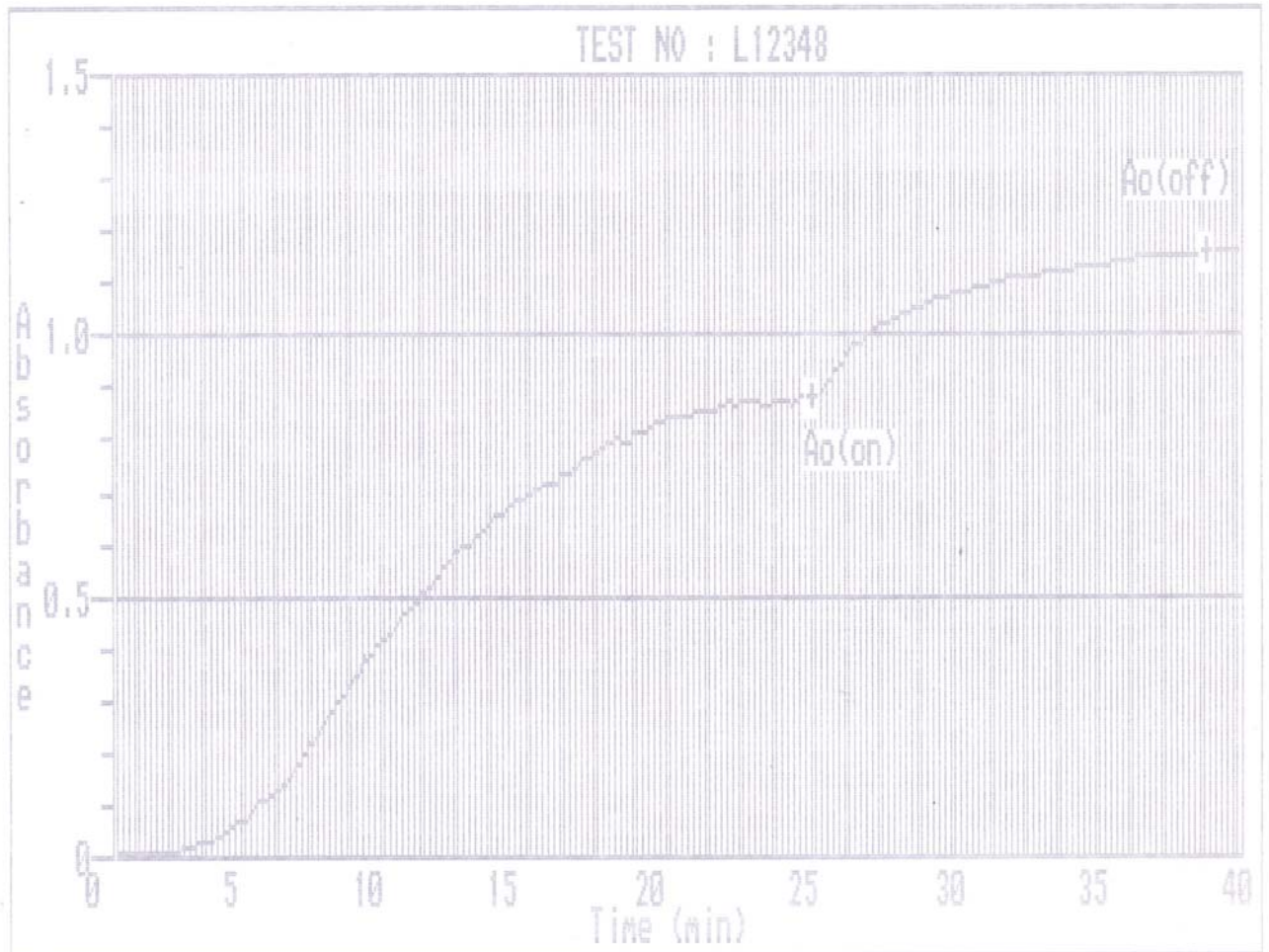


Figure 2 Variation of Absorbance (Ao) with time



Photo 1: Specimen before test



Photo 2: Specimen after test