



Transfire Services Limited

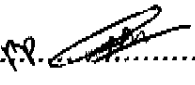
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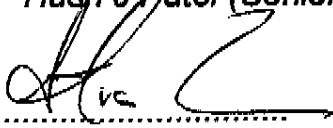
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Issue Date: 9th October 2003

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TEST REPORT

TSL NO. R17773

BS6853: 1999 Annex D.
Clause D.8.3
Code of Practice for fire
precautions in the design
and construction of
passenger carrying
trains.
'three metre cube smoke
emission test'

BS6853: 1999 ANNEX D. CLAUSE D.8.3 "CODE OF PRACTICE FOR FIRE PRECAUTIONS IN THE DESIGN AND CONSTRUCTION OF PASSENGER CARRYING TRAINS". 'THREE METRE CUBE SMOKE EMISSION TEST'



CONDITIONS OF ISSUE OF REPORTS.

THIS REPORT IS ISSUED TO THE CLIENT IN CONFIDENCE AND SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF TRANSFIRE SERVICES LIMITED.

QUERIES OR FURTHER INFORMATION.

ANY QUERIES OR REQUESTS FOR ADDITIONAL INFORMATION ON THE SUBJECT OF THIS REPORT SHOULD BE ADDRESSED TO THE AUTHOR WHO MAY BE CONTACTED AT THE ADDRESS GIVEN ON THE TITLE PAGE.

BS6853: 1999 ANNEX D. CLAUSE D.8.3 "CODE OF PRACTICE FOR FIRE PRECAUTIONS IN THE DESIGN AND CONSTRUCTION OF PASSENGER CARRYING TRAINS". 'THREE METRE CUBE SMOKE EMISSION TEST'



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1. INTRODUCTION

Sample specimen of silicon rubber compound sheets were submitted on 16th July 2003, by Dr P. Jerschow of Wacker-Chemie GmbH, for smoke emission testing in accordance with BS6853: 1999 "Code of Practice for fire precautions in the design and construction of passenger carrying trains".

2. MATERIAL DESCRIPTION

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

Transfire Services Sample reference	Material	Client's sample reference
TSL0029/1	Grey, 3mm thick, silicon rubber compound, referenced "Elastosil R770/50", supplied by Wacker-Chemie GmbH, Germany	ELASTOSIL R770/50
TSL0029/2	White, 3.4mm thick, silicon rubber compound, referenced "Elastosil R770/75", supplied by Wacker-Chemie GmbH, Germany	ELASTOSIL R770/75

The materials were supplied by the sponsor of the test on 16th July 2003 and Transfire Services Ltd was not involved in any selection or sampling procedure.

3. CONDITIONING OF SPECIMENS

The specimens were received on 16th July 2003.

Prior to test the specimens were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 5%.

4. TEST METHOD

4.1 SMOKE EMISSION

The above specimen was tested for smoke emission on 5th and 6th August 2003, in accordance with BS6853: 1999; D8.3 – "Code of Practice for Fire Precautions in the design and construction of passenger carrying trains".

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5. RESULTS

The tests relate to the behaviour of test specimens of the products under particular conditions of test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use. In particular, differences in the thickness, orientation or design may significantly affect fire performance and care should be taken to ensure that any differences between the test conditions and application conditions are not adversely significant.

5.1 SMOKE EMISSION

The measured absorbance A_m is calculated in accordance with the Beer-Lambert Law as follows:

$$A_m = \log_{10} (I_0 / I_t)$$

Where: I_0 = Initial Luminous intensity
 I_t = transmitted Luminous intensity

A_m is converted to Standard absorbance A_o (Figures 1-6; Pages 9-12), using the equation:

$$A_o = (A_m \times V) / (n \times L)$$

Where: V = volume of the cube (27m³)
 L = optical path length (3m)
 N = is the number of units comprising the specimen.

The calculated results (rounded up to 5 d.p) are as follows:

The results obtained were as follows:

Sample Reference	Test Mass (g)	Test	Result $A_o(\text{abs}) \text{ m}^2/\text{g}$
TSL0029/1	42.53	1	0.00717
	46.94	2	0.00831
Average			0.00776
Standard Deviation			0.00084

Sample Reference	Test Mass (g)	Test	Result $A_o(\text{abs}) \text{ m}^2/\text{g}$
TSL0029/2	47.92	1	0.00814
	49.71	2	0.00925
Average			0.00870
Standard Deviation			0.00079

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6. CONCLUSION

The recommended compliance criterion for Category Ia 'Interior minor use materials of mass 100g to 500g is an Ao value of less than 0.017. The materials referenced "Elastosil R770/50" and "Elastosil R770/75" therefore, meets the criterion.

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OBSERVATIONS

SAMPLE REFERENCE TSL0029/1

TEST 1.

Time (min.sec)	Observations
1.50	Marginal flaming of the specimen at edges.
1.50 – 3.40	Specimen continues to flame.
4.20	Material consumed.

TEST 2.

Time (min.sec)	Observations
1.30	Marginal flaming of the specimen at edges.
1.30 – 3.20	Specimen continues to flame.
4.40	Material consumed.

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OBSERVATIONS

SAMPLE REFERENCE TSL0029/2

TEST 1.

Time (min.sec)	Observations
1.45	Marginal flaming of the specimen at edges.
1.45 – 3.25	Specimen continues to flame.
4.35	Material consumed.

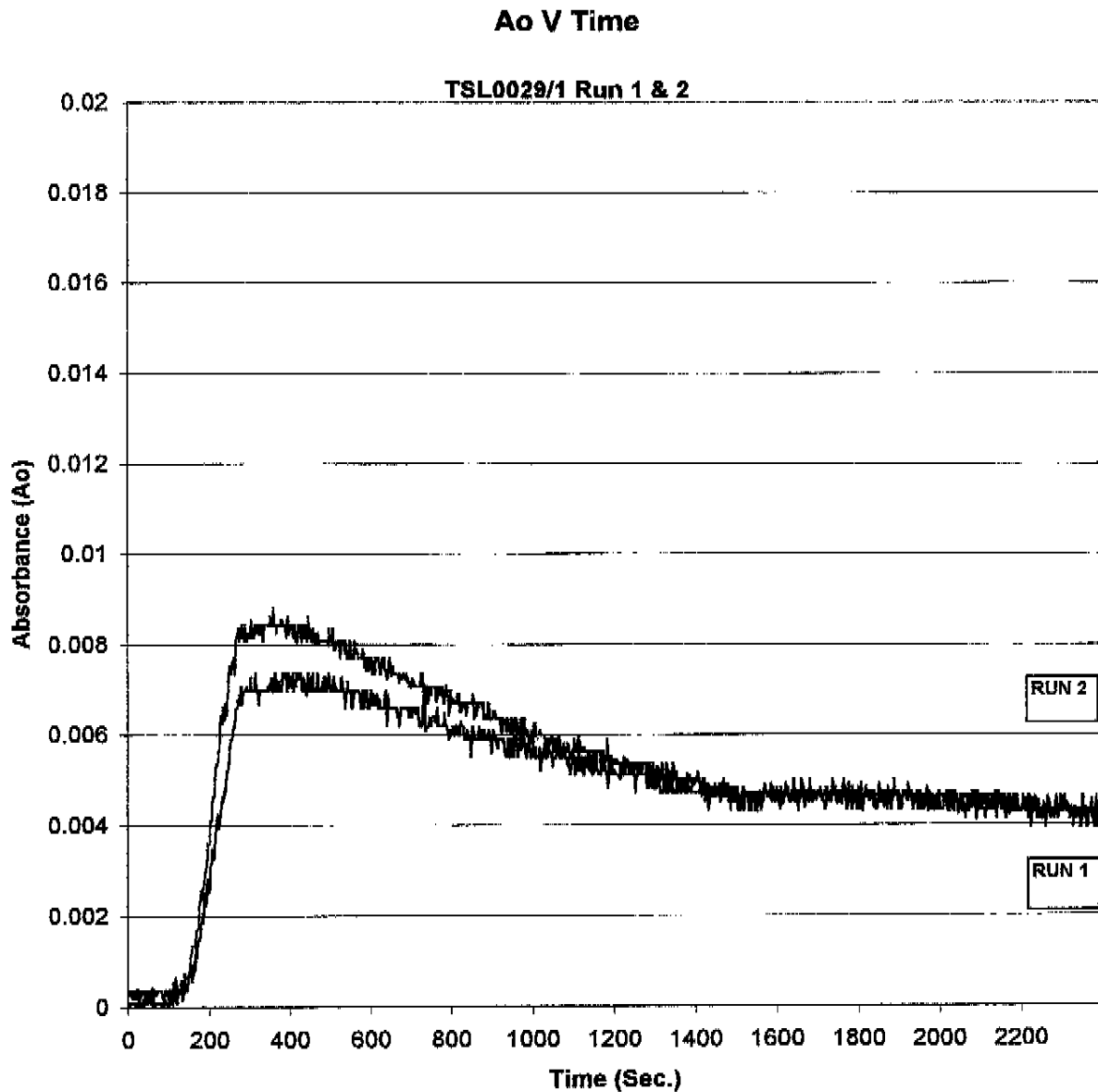
TEST 2.

Time (min.sec)	Observations
1.40	Marginal flaming of the specimen at edges.
1.40 – 3.20	Specimen continues to flame.
4.45	Material consumed.

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Figure 1: Variation of Absorbance (Ao) with Time of two specimens (specimen No.1)



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Figure 2: Variation of Absorbance (Ao) with time (specimen No: 1)

Ao V Time

TSL0029/1 Run 1

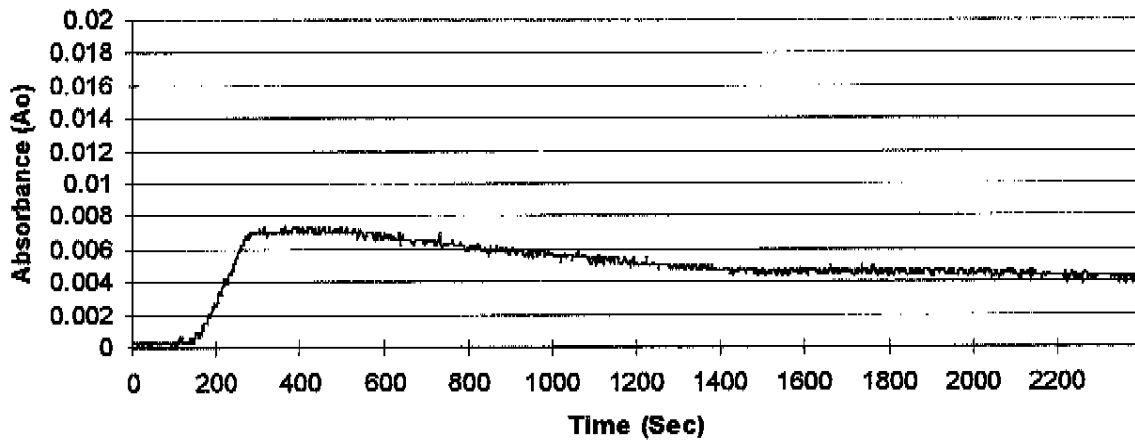
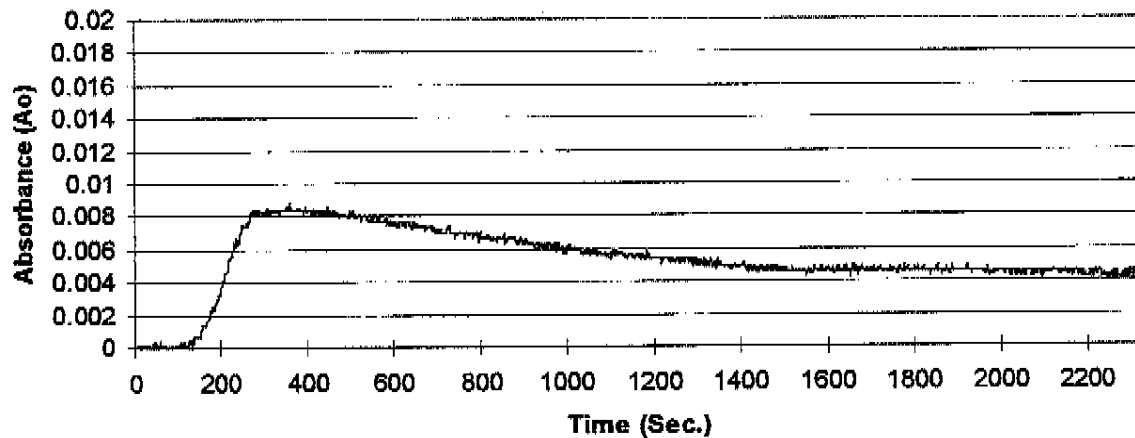


Figure 3: Variation of Absorbance (Ao) with time (specimen No: 1)

Ao V Time

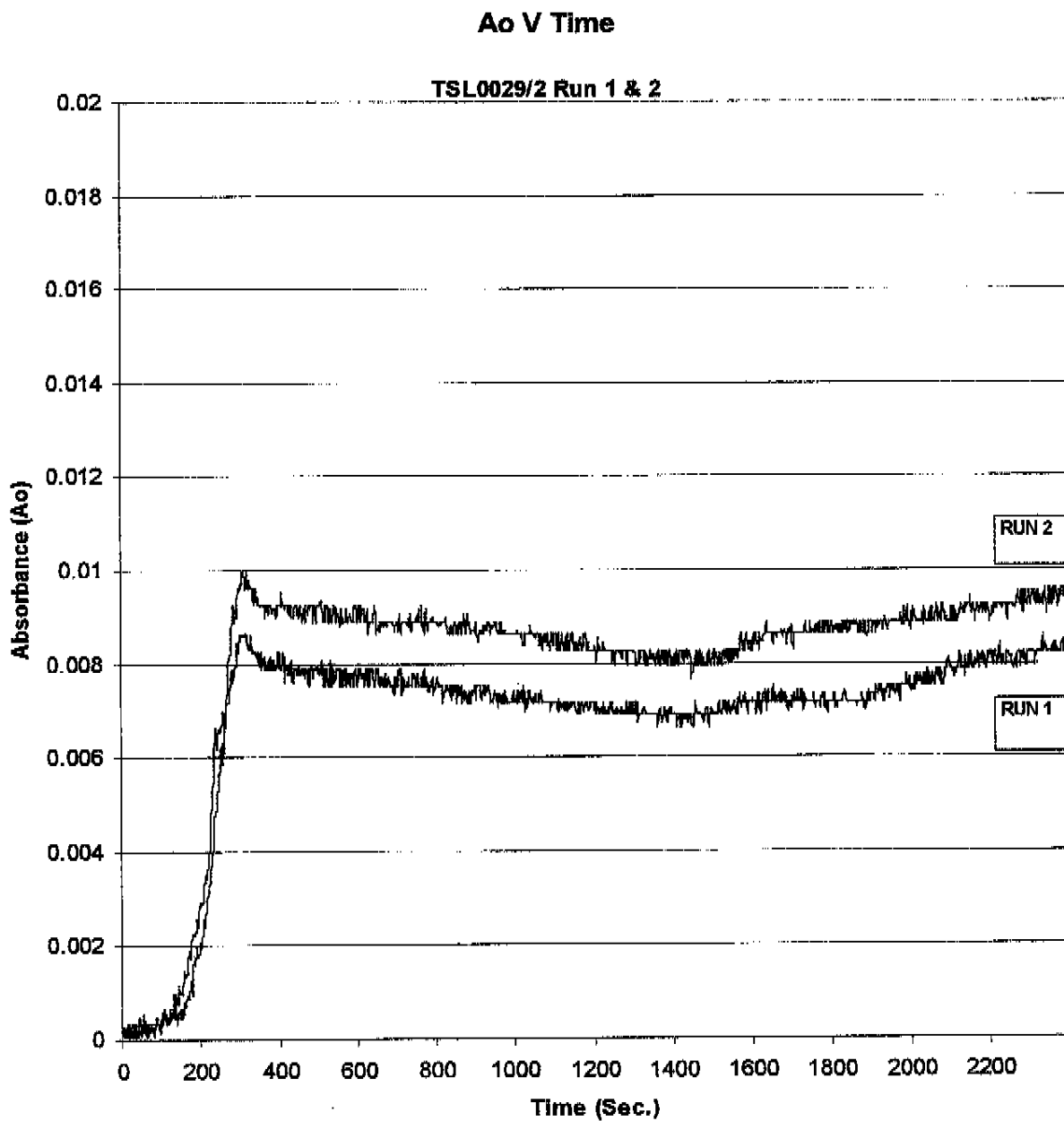
TSL0029/1 Run 2



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Figure 4: Variation of Absorbance (Ao) with two specimens (Specimen No.2)



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Figure 2: Variation of Absorbance (Ao) with time (specimen No: 2)

Ao V Time

TSL0029/2 Run 1

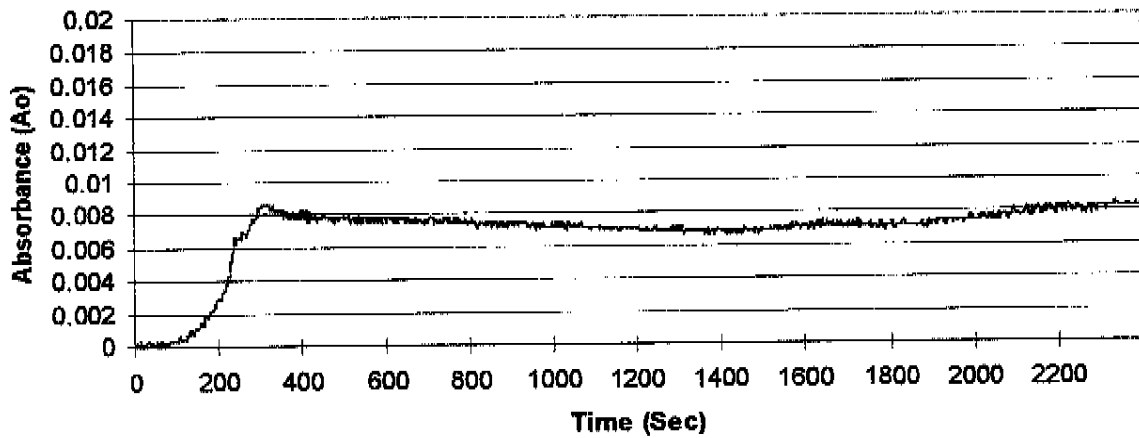


Figure 3: Variation of Absorbance (Ao) with time (specimen No: 2)

Ao V Time

TSL0029/2 Run 2

