

BRE Global Test Report

**IMO 2010 FTP Code Part 5 - Test For Surface Flammability
MSC.307(88) on PVC film ORAJET 3951-010, printed with solvent
based inks in colour Orange. Laminated with ORAGUARD 290 and
applied on aluminium**

Prepared for: ORAFOL Europe GmbH

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1 Objective

To determine the flame spread characteristics of the sample described in Section 2 in accordance with the test method and criteria for bulkhead wall and ceiling linings, floor coverings, and primary deck coverings, specified in the IMO 2010 FTP Code Part 5 - Test For Surface Flammability (Test For Surface Materials And Primary Deck Coverings). MSC.307(88)¹.

2 Sample

2.1 Traceability

The test samples were supplied by the test sponsor. BRE Global were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market.

2.2 Description of sample and test format.

Unless otherwise stated all measurements are nominal.

Test Sponsor	ORAFOL Europe GmbH Orafolstraße 2 D16515 Oranienburg Germany
Manufacturer of sample	As above
Sample name/reference	PVC film ORAJET 3951-010, printed with solvent based inks in colour Orange. Laminated with ORAGUARD 290 and applied on aluminium
Sample description (as provided by test sponsor/manufacturer)	As above ORAGUARD 290 – Cast PVC film, 50µm thick with solvent polyacrylate permanent adhesive ORAJET 3951-010 - Cast PVC film with gloss surface, 55µm thick with solvent polyacrylate repositionable permanent adhesive On aluminium
Description of sample (as received)	Metal sheet with orange film on one face
Mean sample weight per unit area (kg/m ²)	8.31
Sample thickness (mm)	3.2 (inc. aluminium substrate)
Sample receipt date	06 November 2014
Test face	Film face



Test format	The sample was tested with a calcium silicate backing board
Date of test	10 November 2014

3 Conditioning

The specimens were conditioned as required by the standard.

4 Results

4.1 Flame spread data

Observed ignition time, extinction time, duration of test, final spread of flame for each specimen and time to reach each reference point.

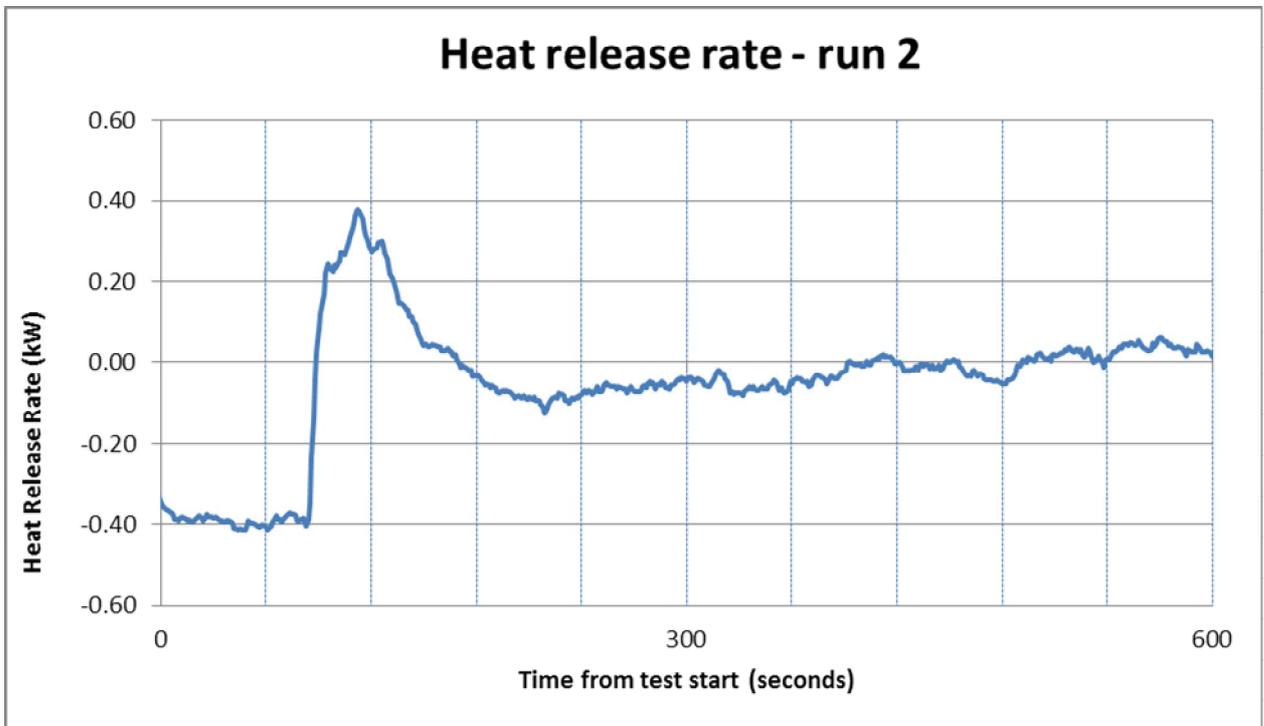
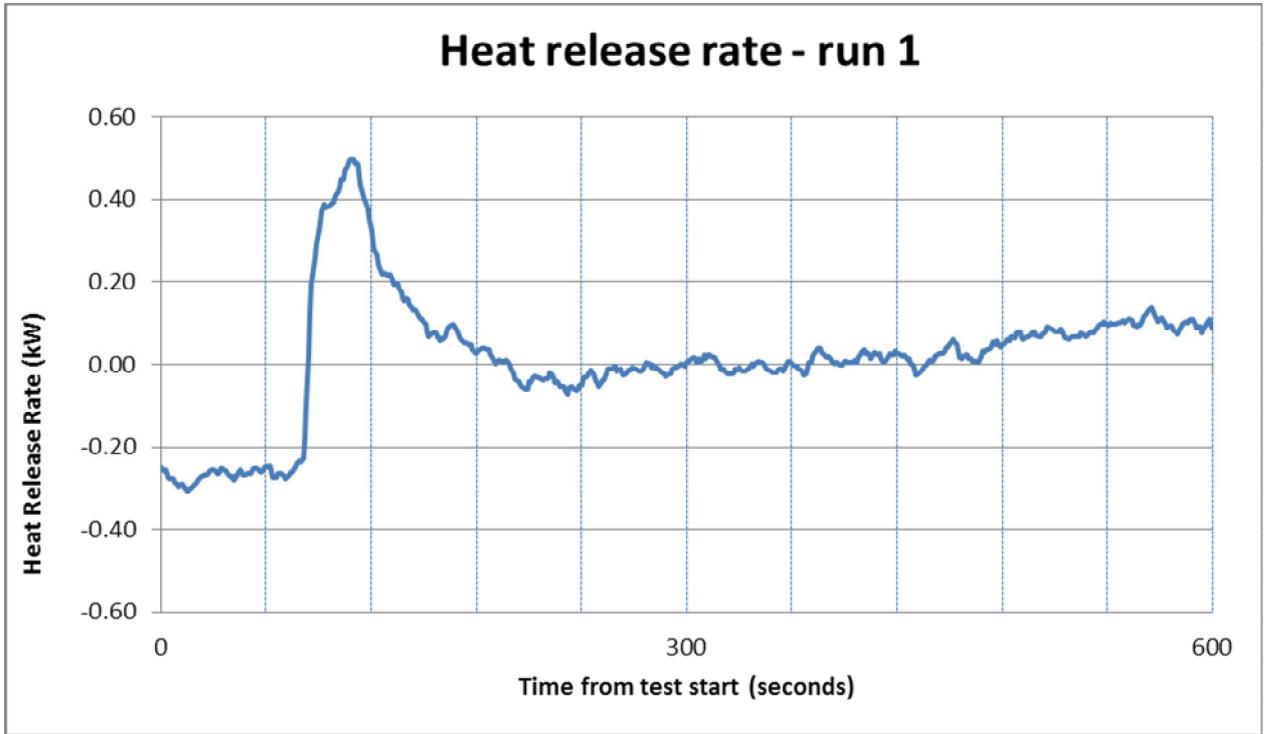
	Flame spread times:					
	Run 1	e7533-2	Run 2	e7533-1	Run 3	e7533-4
Flame spread distance (mm)	minutes	seconds	minutes	seconds	minutes	seconds
50	1	26	1	34	1	24
100	1	26	1	34	1	24
150	1	32	1	41	1	24
200	1	36	1	52	1	34
250	2	14	2	09	1	57
300	2	41	2	39	2	27
350						
400						
450						
500						
550						
600						
650						
700						
750						
Maximum flame spread (mm)	330		340		340	
Time to ignition (minutes : seconds)	01	24	01	29	01	20
Flaming ceased (min:sec)	03	36	03	21	03	17
Test stopped	10	00	10	00	10	00

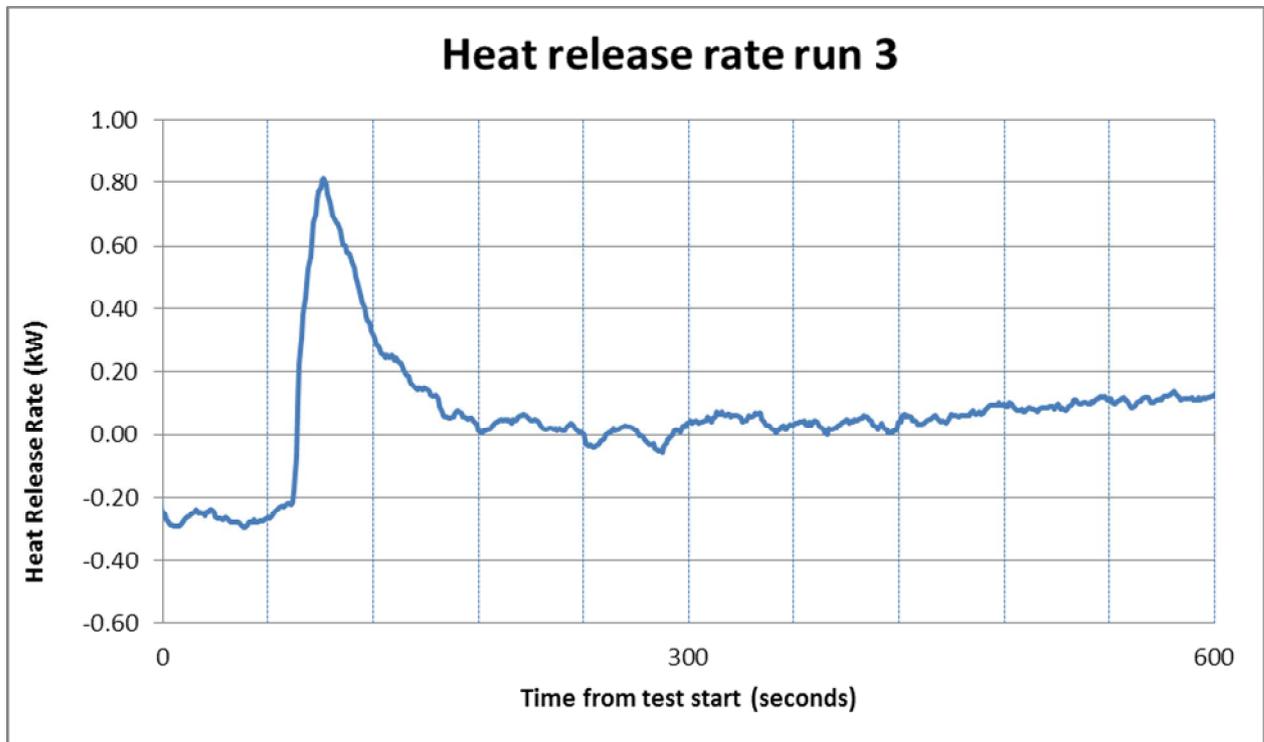
4.2 Observations.

On each of the specimens blistering occurred approximately 2 seconds before ignition

4.3 Heat release curves

Heat release curves for each specimen are given below





4.4 Derived fire characteristics

Derived fire characteristics for each specimen as defined in the objective.

Criteria	Specimen			
	1	2	3	Average
Heat for Ignition (MJ/m ²)	4.10	4.50	3.75	4.12
Critical Flux at Extinguishment ((kW/m ²) <i>CFE</i>	27.28	26.01	26.01	26.43
Average Heat for sustained burning (MJ/m ²) <i>Qsb</i>	4.49	4.69	4.11	4.43
Total Heat release (MJ) <i>Qt</i>	0.03	0.02	0.06	0.04
Peak Heat release (kW) <i>Qp</i>	0.50	0.38	0.81	0.56



5 Criteria

Samples giving average values for all the surface flammability criteria not exceeding those listed below, are considered to meet the requirements for low flame spread.

	Bulkhead, wall and ceiling linings	Floor coverings	Primary deck coverings
<i>CFE</i> (kW/m ²)	≥ 20.0	≥ 7.0	≥ 7.0
<i>Qsb</i> (MJ/m ²)	≥ 1.5	≥ 0.25	≥ 0.25
<i>Qt</i> (MJ)	≤ 0.7	≤ 2.0	≤ 2.0
<i>Qp</i> (kW)	≤ 4.0	≤ 10.0	≤ 10.0
Burning droplets	Not produced	No more than 10 burning drops	Not produced

Where *CFE* = Critical flux at extinguishment
Qsb = Average heat for sustained burning
Qt = Total heat release
Qp = Peak heat release rate

6 Conclusion

The results of this test show that the sample as described in this report, when tested and classified in accordance with IMO 2010 FTP Code. Part 5 - Test For Surface Flammability (Test For Surface Materials And Primary Deck Coverings). MSC.307(88)1 satisfied the requirements for low flame spread for use as:

Bulkhead, wall and ceiling linings

Floor coverings

Primary deck coverings

7 Validity

The test results relate only to behaviour of the test specimens of the product under the particular conditions of test, they are not intended to be the sole criteria for assessing the potential fire hazard of the product in use.



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 5 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.

8 Reference

- 1 Resolution MSC.307(88) Adoption of the International Code for application of fire test procedures 2010, Annex 1, Part 5 Test for surface flammability Test for surface materials and primary deck coverings. International Maritime Organisation: London 2010.