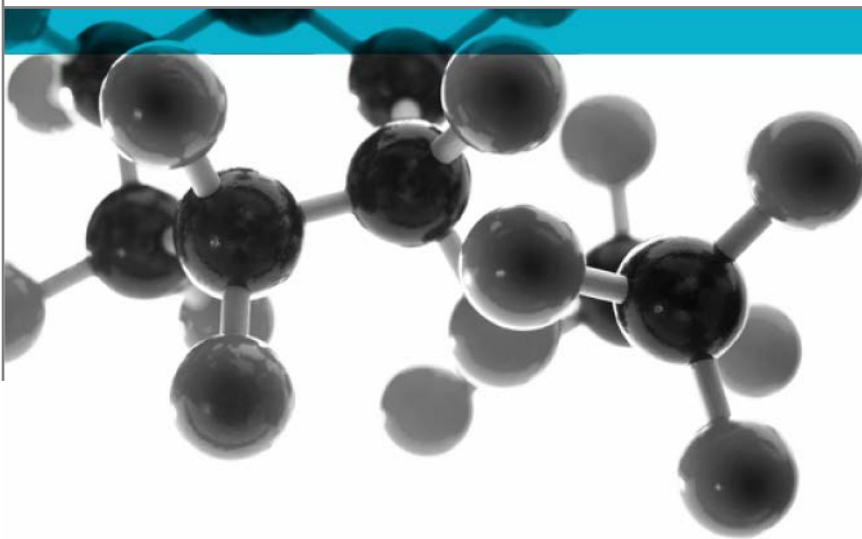


EN 45545-2: 2013 + A1:2015



Summary Test Report – Requirement Table 5 (R1 & R7)

Test Method References “T02” (ISO 5658-2:2006+A1:2011. Spread of Flame - Lateral Spread of flame test on Building and Transport Products in Vertical Configuration), “T03.01” (ISO 5660-1: 2015; Heat release rate (Cone Calorimeter Method) & Smoke Production Rate (Dynamic Measurement), “T10.01” / “T10.02” / “T10.04” (ISO 5659-2: 2017; Plastics – Smoke Generation. Part 2 Determination of Optical Density by a Single Chamber Method) and “T11.01” (Gas Analysis in the Smoke Box EN ISO 5659-2, using FTIR Technique)

A Report To: Smyth Composites Ltd

Document Reference: 422294

Date: 28th January 2020

Issue No.: 1

Page 1

Executive Summary

Objective

To assess the results of tests performed in accordance with methods T02, T03.01, T10.01 / T10.02 / T10.04 and T11.01 as defined in EN 45545-2: 2013 + A1:2015 at an irradiance level of 50kW/m² without a pilot flame, on specimens of a product and to provide an opinion of compliance with the requirements for R1 & R7, as defined in EN 45545-2: 2013 + A1:2015.

Generic Description		Product reference	Thickness	Weight per unit area
Coated fibre reinforced phenolic resin sheet		"Phenclad"	3.5mm	3.4kg/m ²
Individual components used to manufacture composite:				
Coating		"AE 265/8"	Unable to provide	Unable to provide
Moulded sheet	Phenolic resin	"Cellobond"	Not applicable	Not applicable
	Fibre reinforcement	"Dong Yu"	Not applicable	2 x 600g/m ²
Please see page 6 of this test report for the full description of the product tested				

Test Sponsor


Smyth Composites Ltd, Panmure Industrial Estate, Carnoustie, Angus, DD7 7NP

Opinion


We consider the results of the tests confirmed in reports referenced 422291, 422292 & 422293 to the test methods detailed above demonstrate that the product, as tested, complies with the requirements of R1 (detailed in Table 5 of EN 45545-2: 2013 + A1:2015) for a HL1, HL2 and HL3 Hazard Level Classification.

We consider the results of the tests confirmed in reports referenced 422291, 422292 & 422293 to the test methods detailed above demonstrate that the product, as tested, complies with the requirements of R7 (detailed in Table 5 of EN 45545-2: 2013 + A1:2015) for a HL1, HL2 and HL3 Hazard Level Classification.

Signatories



Responsible Officer
S. Jones *
Technical Officer



Authorised
T. Mort *
Senior Technical Officer

* For and on behalf of [Warringtonfire](#).

Report Issued: 28th January 2020

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Author: S. Jones

Client: Smyth Composites Ltd.

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Test Details

Terms Of Reference

To assess the results of tests performed in accordance with methods T02, T03.01, T10.01 / T10.02 / T10.04 and T11.01 as defined in EN 45545-2: 2013 + A1:2015 at an irradiance level of 50kW/m² without a pilot flame, on specimens of a product and to provide an opinion of compliance with the requirements for R1 & R7, as defined in EN 45545-2: 2013 + A1:2015.

Note – Method ‘T02’ requires testing in accordance with ISO 5658-2:2006. Warringtonfire conduct the test in accordance with the latest version of this standard (ISO 5658-2:2006 + A1:2011).

The only difference is the calculation used to determine the Qsb value. This is not required to classify in accordance with EN 45545-2:2015, and will therefore have no affect on the overall classification.

Introduction

Specimens of a product have been tested in accordance with the test methods “T02” (ISO 5658-2:2006+A1:2011. Spread of Flame - Lateral Spread of flame test on Building and Transport Products in Vertical Configuration), “T03.01” (ISO 5660-1: 2015; Heat release rate (Cone Calorimeter Method) & Smoke Production Rate (Dynamic Measurement), “T10.01” / “T10.02” / “T10.04” (ISO 5659-2: 2017; Plastics – Smoke Generation. Part 2 Determination of Optical Density by a Single Chamber Method) and “T11.01” (Gas Analysis in the Smoke Box EN ISO 5659-2, using FTIR Technique) as specified in EN 45545-2:2013 + A1:2015 “Requirements for Fire Behaviour of Materials and Components”. The results of the tests are fully reported in the Warringtonfire test reports No's. 422291, 422292 & 422293.

This summary report has been prepared at the request of the sponsor and relates the results of the tests to the requirements for R1 & R7, as defined in Table 5 of EN 45545-2: 2013 + A1:2015.

This summary should be read in conjunction with, and not accepted as a substitute for the Warringtonfire test reports No's. 422291, 422292 & 422293.

Those test reports may include additional information which may be relevant to the assessment of the potential fire hazard of the product. Where this assessment covers a system used on European rolling stock covered by the Technical Specification for Interoperability (LOC&PAS TSI (Commission Regulation (EU) No. 1302/2014)) all tests must have been conducted within the last 5 years or the test reports must have been reviewed within the last five years.

Face subjected to tests

The specimens were mounted in the test positions such that the smooth face was exposed to the heating conditions of the tests.

Results of test

The following results were obtained for the specimens, which were tested.

“T02” ISO 5658-2:2006+A1:2011

Critical flux at extinguishment (CFE) = 40.57 kW/m²
Flaming droplets with sustained flaming (>10s) = No

“T03.01” ISO 5660-1: 2015

MARHE = 29.1 kW/m²

“T10.01” / “T10.02” / T10.04 ISO 5659-2: 2017

Ds (4) = 60
VOF4 = 93
Ds max. = 142

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“T11.01” Gas Analysis in the Smoke Box ISO, Using FTIR Technique

CIT_{4mins} = 0.11
CIT_{8mins} = 0.25

Applicability of test results

The test results relate only to the behaviour of the test specimens of the product under the particular conditions of the test, they are not intended to be the sole criterion for assessing the potential 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 will therefore invalidate the test results. It is the responsibility of the supplier of the product to ensure that the product which is supplied is identical with the specimens which were tested.

Description of Test Specimens

The description of the specimens given below has been prepared from information provided by the sponsor of the test. This information has not been independently verified by Warringtonfire. All values quoted are nominal, unless tolerances are given.

General description		Coated fibre reinforced phenolic resin sheet	
Product reference		"Phenclad"	
Name of manufacturer		Smyth Composites	
Colour		"White"	
Thickness		3.5mm (stated by sponsor) 3.83mm (determined by Warringtonfire)	
Weight per unit area		3.4kg/m ² (stated by sponsor) 4.77kg/m ² (determined by Warringtonfire)	
Coating	Generic type	2 pack polyurethane	
	Product reference	"AE 265/8"	
	Name of manufacturer	"Trimite"	
	Number of layers	See Note 1 Below	
	Specific gravity	See Note 1 Below	
	Application method	Spray	
	Colour reference	"Ral 9010" "White" (observed by Warringtonfire)	
	Flame retardant details	See Note 1 Below	
Moulded sheet	Resin	Generic type	Phenolic
		Product reference	"Cellobond"
		Name of manufacturer	Hexion
		Specific gravity/density	See Note 1 Below
		Flame retardant details	See Note 2 Below
	Glass reinforcement	Generic type	Powder bound chopped strand matt
		Product reference	"Dong Yu"
		Number of layers	2
		Weight per unit area of each layer	600g/m ²
		Configuration of glass reinforcement	See Note 1 Below
		Name of manufacturer	Dong Yu
	Resin to glass ratio (by weight)		2.7:1
	Percentage glass reinforcement (by weight)		27%
	Curing process (duration and temperature)		2 hours at 90°C
Brief description of manufacturing process		Hand lay	

Note 1: The sponsor of the test was unable to provide this information.

Note 2: The sponsor of the test has confirmed that no flame retardants were used in the production of this component.

Classification

Opinion

We consider the results of the tests confirmed in reports referenced 422291, 422292 & 422293 to the test methods detailed above demonstrate that the product, as tested, complies with the requirements of R1 (detailed in Table 5 of EN 45545-2: 2013 + A1:2015) for a HL1, HL2 and HL3 Hazard Level Classification.

We consider the results of the tests confirmed in reports referenced 422291, 422292 & 422293 to the test methods detailed above demonstrate that the product, as tested, complies with the requirements of R7 (detailed in Table 5 of EN 45545-2: 2013 + A1:2015) for a HL1, HL2 and HL3 Hazard Level Classification.

Validity of opinion

This opinion is based on the requirements of EN 45545-2: 2013 + A1:2015 at the date of this report. If EN 45545-2 is revised or amended in any way subsequent to that date, care must be taken to ensure that this opinion is not invalidated by those revisions or amendments.

The opinion has been formulated on the assumption that the specimens are representative of the product in practice. Warringtonfire was not involved in any sampling or selection procedures which would confirm this or in any audit testing which would provide confidence in the consistency of the product in the tests.

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Revision History

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