REPORT
issued by an Accredited Testing Laboratory

1002
ISO/IEC 17025

Handled by, department
Marina C Andersson
Fire Technology
+46 10 516 52 92, marinac.andersson@sp.se

Date 2009-06-14
Reference P902159D / rev 3
Page 1 (4)
Rev.date 2011-01-04

Dansk Dekor-Laminat A/S
Grönlandsvej 197
DK-7100 VEJLE
DANMARK

Reaction to fire classification report according to CEN/TS 45545-2

Introduction

SP has by request of Dansk Dekor-Laminat A/S performed fire tests according to ISO 5660 and ISO 5659-2. The purpose of the tests is basis for technical fire classification.

This classification report replaces SP classification report P902159D / rev 2, dated June 25, 2009.

Product description

The product, "Alunit type F", is fully described below.

According to the client:
Product called "Alunit type F", consisting of surface material of HPL laminate and a core of Aluminium and backing of coating. Nominal amount of coating 10 g/m^2. The product has a nominal thickness of $\leq$ 2.1 mm.

Test reports & test results in support of classification

This classification is based on test reports listed below:

Name of laboratory	Name of sponsor	Test report ref no	Accredited test method
SP	Dansk Dekor-Laminat A/S	P902159C / rev 2	ISO 5659-2
SP	Dansk Dekor-Laminat A/S	P902159	ISO 5660
SP	Dansk Dekor-Laminat A/S	F611944	ISO 5658-2

Test results

Test method	Parameter	Number of tests	Results	
			Mean value (m)	Hazard level classification, Table 7, R1
ISO 5658-2		3		
Lateral flame spread	CFE (kW/m^2)		46.6	HL3
ISO 5659-2		3		
50 kW/m^2				
Specific optical density of smoke	$D_s(4)$		152	HL2
Cumulative value of specific optical densities in the first 4 min of the test	VOF_4 (min)		364	HL2
Conventional Index of Toxicity	CIT_G		0.23	HL3
ISO 5660		3		
Maximum average rate of heat emission	MARHE (kW/m^2)		37	HL3

Criteria

According to "Railway application – Fire protection on railway vehicles – Part 2: Requirements for fire behaviour of materials and components", CEN/TS 45545-2, 2009.

To meet set of material requirements, table 7, R1, interior components have to meet the following limits when tested according to ISO 5658-2.

HL1
- Lateral flame spread (CFE) shall be minimum 20 kW/m^2.

HL2
- Lateral flame spread (CFE) shall be minimum 20 kW/m^2.

HL3
- Lateral flame spread (CFE) shall be minimum 20 kW/m^2.

To meet set of material requirements, table 7, R1, interior components have to meet the following limits when tested according to ISO 5660: heat flux 50 kW/m^2.

HL1
- Maximum average rate of heat emission (MARHE) no limit.

HL2
- Maximum average rate of heat emission (MARHE) does not exceed 90 kW/m^2.

HL3
- Maximum average rate of heat emission (MARHE) does not exceed 60 kW/m^2.

To meet set of material requirements, table 7, R1, interior components have to meet the following limits when tested according to EN ISO 5659-2: 50 kW/m^2 in the presence of pilot flame.

HL1
- Specific optical density of smoke ($D_s(4)$) does not exceed 600.
- Conventional Index of Toxicity (CIT_G) does not exceed 1.2.
- Cumulative value of specific optical densities in the first 4 min of the test (VOF4) does not exceed 1200 min.

HL2
- Specific optical density of smoke ($D_s(4)$) does not exceed 300.
- Conventional Index of Toxicity (CIT_G) does not exceed 0.9.
- Cumulative value of specific optical densities in the first 4 min of the test (VOF4) does not exceed 600 min.

HL3
- Specific optical density of smoke ($D_s(4)$) does not exceed 150.
- Conventional Index of Toxicity (CIT_G) does not exceed 0.75.
- Cumulative value of specific optical densities in the first 4 min of the test (VOF4) does not exceed 300 min.

Classification

The tested product called "Alunit type F", having a nominal thickness of ≤ 2.1 mm meets the technical fire requirements for R1, hazard level 2, according to the criteria mentioned above.

Reaction to fire classification: *R1, HL2*

SP Technical Research Institute of Sweden
Fire Technology - Fire Dynamics

Per Thureson
Technical Manager

Marina C Andersson
Technical Officer