

Testing. Advising. Assuring.

Ms M Schiller
3m Deutschland GmbH
Carl-Schurz-Str. 1
41453 Neuss
Germany

26th October 2017
Our ref: 385415/26/36/45/530

Dear Ms Schiller

We confirm that the indicative tests in accordance with BS EN 45545-2:2013+A1:2015 on your nominally 4.3mm composite comprising you adhesive (product reference "VBH 4991") sandwiched between two 1mm thick aluminium sheets have now been carried out.

We consider the results of the tests indicate that the product, as tested, complies:

Requirement Set (detailed in Table 5 of EN 45545-2: 2013 + A1:2015)	Indicated Hazard Level Classification
R1	HL1, HL2 and HL3
R2	HL1, HL2 and HL3
R3	HL1, HL2 and HL3
R6	HL1, HL2 and HL3
R7	HL1, HL2 and HL3
R10	HL1, HL2 and HL3
R11	HL1, HL2 and HL3
R12	HL1, HL2 and HL3
R17	HL1, HL2 and HL3

The above is based on the following indicative results that have been achieved:

WF Number: 385436

ISO 5659-2 / EN 45545-2 Annex C Smoke and Toxicity Test, Test mode: 50kW/m² in the absence of a pilot flame

Smoke density at 4 minutes test duration, Ds (4) = 0

Smoke accumulation, VOF4 = 0

Maximum smoke density within first 10 minutes of test, Ds (max) within 10 minutes = 0

Maximum smoke density within first 20 minutes of test, Ds (max) within 20 minutes = 140

Critical Index of Toxicity, CIT value (4 minutes) = 0.00

Critical Index of Toxicity, CIT value (8 minutes) = 0.00

Gas	CO	CO ₂	SO ₂	HCl	HBr	HF	HCN	NO _x
4 minutes (mg/m ³)	1	57	ND	ND	ND	ND	ND	2
8 minutes (mg/m ³)	3	60	ND	ND	ND	ND	ND	2

WF Number: 385530

ISO 5659-2 / EN 45545-2 Annex C Smoke and Toxicity Test, Test mode: 25kW/m² in the presence of a pilot flame

Smoke density at 4 minutes test duration, Ds (4) = 0

Smoke accumulation, VOF4 = 1

Maximum smoke density within first 10 minutes of test, Ds (max) within 10 minutes = 0

Maximum smoke density within first 20 minutes of test, Ds (max) within 20 minutes = 0

Critical Index of Toxicity, CIT value (4 minutes) = 0.01

Critical Index of Toxicity, CIT value (8 minutes) = 0.02

Gas	CO	CO ₂	SO ₂	HCl	HBr	HF	HCN	NO _x
4 minutes (mg/m ³)	3	2091	ND	ND	ND	ND	ND	2
8 minutes (mg/m ³)	5	4608	ND	ND	ND	ND	ND	5

WF Number: 385445

BS EN ISO 9239-1 Test

Maximum Flame-out Distance (cm)	Critical Heat Flux, CHF (kW/m ²)	Smoke Development (% minute)
≤5	≥10.8	0.00

WF Number: 385426

BS EN ISO 5660-1 Test

Maximum average rate of heat Release (MARHE) kW/m ²	43.7
Time to MARHE seconds	760

WF Number: 385415

BS EN ISO 5658-2 Test

Critical flux at extinguishment, CFE (kW/m ²)	Heat for sustained burning, Qsb (MJ/m ²)
50.0	*

*Could not be calculated due to flame travel not reaching 180mm

The specimens were supplied by yourselves on the 26th June 2017. **Exova Warringtonfire** was not involved in any sampling or selection procedure.

These test results relate to exploratory investigations which utilised the test methodology given in BS EN 45545-2:2013+A1:2015 the full requirements of the Standard were not, however, complied with. The information is provided for your information only and should not be used to demonstrate performance against the Standard nor compliance with a regulatory requirement. The test was not conducted under the requirements of UKAS accreditation.

If you require any further assistance regarding the interpretation of these test results, please do not

hesitate to contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Beth Dean', with a stylized, cursive script.

Beth Dean
Technical Leader
Reaction to Fire Testing