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Testing. Advising. Assuring.

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

17<sup>th</sup> October 2017 Our ref: 387350/1/2/3/4

#### Dear Ms Schiller

We confirm that the indicative tests in accordance with BS EN 45545-2:2013+A1:2015 on your nominally 3mm composite comprising you adhesive (product reference "Carbon Bonder DP6330NS") 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	Indicated Hazard Level Classification			
45545-2: 2013 + A1:2015)				
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			

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

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

R10

R11

R12 R17

#### WF Number: 387353

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

HL1, HL2 and HL3

HL1, HL2 and HL3 HL1, HL2 and HL3

HL1, HL2 and HL3

Smoke density at 4 minutes test duration, Ds (4) = 0Smoke accumulation, VOF4 = 1 Maximum smoke density within first 10 minutes of test, Ds (max) within 10 minutes = 1 Maximum smoke density within first 20 minutes of test, Ds (max) within 20 minutes = 204 Critical Index of Toxicity, CIT value (4 minutes) = 0.00 Critical Index of Toxicity, CIT value (8 minutes) = 0.00

Gas	CO	CO <sub>2</sub>	SO <sub>2</sub>	HCI	HBr	HF	HCN	NO <sub>x</sub>
4 minutes (mg/m <sup>3</sup> )	1	172	ND	ND	ND	ND	ND	2
8 minutes (mg/m <sup>3</sup> )	1	226	ND	ND	ND	ND	ND	2

# WF Number: 387354

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

Smoke density at 4 minutes test duration, Ds (4) = 0Smoke 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 = 0 Critical Index of Toxicity, CIT value (4 minutes) = 0.01 Critical Index of Toxicity, CIT value (8 minutes) = 0.02

Gas	CO	CO <sub>2</sub>	SO <sub>2</sub>	HCI	HBr	HF	HCN	NO <sub>x</sub>
4 minutes (mg/m <sup>3</sup> )	2	2813	ND	ND	ND	ND	ND	5
8 minutes (mg/m <sup>3</sup> )	4	5850	ND	ND	ND	ND	ND	8

#### WF Number: 387350 BS EN ISO 9239-1 Test

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

# WF Number: 387352 BS EN ISO 5660-1 Test

Maximum average rate of heat Release (MARHE)	kW/m <sup>2</sup>	31.5
Time to MARHE	seconds	502

WF Number: 387351 BS EN ISO 5658-2 Test

Critical flux at extinguishment, CFE	Heat for sustained burning, Qsb	
(kW/m²)	(MJ/m²)	
50.0	*	

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

The specimens were supplied by yourselves on the 7<sup>th</sup> August 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

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**Beth Dean** Technical Leader Reaction to Fire Testing