

# **BRE Global Test Report**

EN 13823 Single Burning Item (SBI) test on ARMARK PUREZONE60

Prepared for: Armadillo Marketing Limited T/A Armadillo Lighting

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BRE Global Ltd Watford, Herts WD25 9XX

Customer Services 0333 321 8811

From outside the UK: T + 44 (0) 1923 664000 F + 44 (0) 1923 664010 E enquiries@bre.co.uk www.bre.co.uk Prepared for:

Armadillo Marketing Limited T/A Armadillo Lighting Bigods Hall Bigods Lane Great Dunmow Essex CM6 3BE England



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#### **Prepared by**

Name C A Rock

Position Senior Consultant

Signature

#### **Authorised by**

Name J Hunter

Position Section Leader – Reaction to Fire

ARock

Date 26 January 2021

Signature

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#### 1 Objective

To assess the performance of the sample described in Section 2 of this report when subjected to the tests specified in EN 13823: 2010 + A1: 2014<sup>1</sup>.

#### 2 Sample

#### 2.1 Traceability

The test sample was supplied by the test sponsor. BRE Global was not involved in the sample selection process and therefore cannot comment upon the relationship between the sample supplied for test and the product supplied to market. The results apply to the sample as received.

#### 2.2 Description of sample and test format

Unless otherwise stated all measurements are nominal.

Parameter	Details
Test sponsor	Armadillo Marketing Limited T/A Armadillo Lighting Bigods Hall Bigods Lane Great Dunmow Essex, CM6 3BE England
Prepared for	Armadillo Marketing Limited T/A Armadillo Lighting Bigods Hall Bigods Lane Great Dunmow Essex, CM6 3BE England
Manufacturer of sample	Hexis S.A. ZI Horizons Sud 34110 Frontignan France
Place of manufacture	Note 1
Trade name	ARMARK PUREZONE60
Sample reference	ARMARK PUREZONE60
Sample description (as provided by test sponsor/manufacturer)	Self-adhesive anti-microbial film made of:  • Acrylic adhesive  • PVC film
Description of sample (as received)	A transparent film applied to a nominal 2 mm-thick aluminium sheet.
Test sponsor's product data	
Generic type of product	Cast polymeric PVC containing antimicrobial agents coated with pressure-sensitive acrylic adhesive.



Parameter	Details		
Nominal thickness (mm)	0.105		
Nominal mass per unit area (kg/m²)	0.120		
Colour	Transparent		
Flame retardant treatment added, or organic content limited during production (yes/no)	Note 1		
European product standard, if applicable	Note 1		
Film			
Generic type of film	Cast polymeric PVC containing antimicrobial agents		
Manufacturer	Note 1		
Finish	Gloss		
Nominal thickness (µm)	60		
Nominal density (kg/m³)	Note 1		
Nominal mass per unit area (kg/m²)	Note 1		
Colour	Transparent		
Adhesive			
Generic type of adhesive	Solvent-based, pressure-sensitive, acrylic-based adhesive (present on the film).		
Manufacturer	Note 1		
Nominal thickness (µm)	40		
Nominal density (kg/m³)	Note 1		
Nominal mass per unit area (g/m²)	40		
Colour	Transparent		
Substrate and ventilation conditions			
Generic type of substrate	Aluminium sheet		
Manufacturer	Note 1		
Nominal thickness (mm)	2		
Nominal density (kg/m³)	2700		
Nominal mass per unit area (kg/m²)	5.4		
Type of air gap	None		
Measured sample data, determined by BRE at a relative humidity of 50 $\pm$ 5 %	Global, measured at a temperature of 23 ± 3 °C and		
Mean sample thickness (mm)	EN 13823: 2.00 EN ISO 11925-2: 2.01 (range 2.00 to 2.01) Substrate: 1.91 Dry film: 0.10 (range 0.09 to 0.10)		



Parameter	Details
Mean sample mass per unit area (kg/m²)	EN 13823: 5.26 (range 5.26 to 5.27) EN ISO 11925-2: 5.27 (range 5.26 to 5.27) Substrate: 5.15 (range 5.14 to 5.15) Film: 0.12
Mean sample mass per unit area of dry film (g/m²)	117.22 (range 116.37 to 118.08)
Test information	
Face to be tested	Film face
Orientation aspects	Not applicable
Test sponsor's sampling identification	Note 1
BRE Global sample number	E13163
Sample receipt date	02 November 2020
Date into conditioning	02 November 2020
Date of test	18 November 2020
Additional information	Purchase Order: PROD.:10527 dated 14/10/2020

Note 1: This information was not supplied by the test sponsor.

#### 2.3 Description of substrate and fixing

The test specimen was self-adhered to a nominal 2 mm-thick, 2700 kg/m³ aluminium sheet using a solvent-based, pressure-sensitive, acrylic-based adhesive (present on the back face of the film).

#### 2.4 Jointing details

There were no joints in the test specimen, other than the corner joint.

#### 2.5 Mounting technique

The back face of the test specimen (sample and substrate) were mounted directly against the front face of a calcium silicate backing board.

#### 3 Conditioning

The test specimens were conditioned as required by the test standard.



#### 4 Results

#### 4.1 Tabulated data

**Table 1: Event summary** 

Event	Occurrence of event (Yes/No)			
Run Number	1	2	3	
Calorimeter code	S181120c	S181120d	S181120e	
Occurrence of a surface flash	No	No	No	
Smoke from the specimen not entering the hood during the test	No	No	No	
Falling of parts of the specimen	No	No	No	
Development of a gap in the corner (mutual fixing of backing boards fails)	No	No	No	
Occurrence of one or more conditions which justify an early termination of the test	No	No	No	
Distortion (1) or collapse (2) of the specimen	Yes (1)*	Yes (1)*	Yes (1)*	
Test duration (s)	1560	1560	1560	
Any other event	See observations			

<sup>\*</sup> The aluminium substrate on the short wing bowed during the test.

#### Note:

Specimens with an average rate of smoke production value, RSP<sub>av</sub>, of not more than 0.1 m²/s during the total test period or a total smoke production value of not more than 6 m² over the total test period have a SMOGRA value of zero.

The fire growth rate indices are calculated only for that part of the exposure period in which the threshold levels for  $RHR_{av}(t)$  and THR have been exceeded. If one or both threshold values are not exceeded during the exposure period, FIGRA is equal to zero. The threshold value used for  $RHR_{av}(t)$  is 3 kW. Two different THR threshold values are used, resulting in  $FIGRA_{0.2MJ}$  and  $FIGRA_{0.4MJ}$ .

Values of  $THR_{600s}$  and  $TSP_{600s}$  refer to a time of 600 s after the flame has been applied to the specimen. This is 300 s after the start of the test, and therefore represents a time of 900 s in the graphs presented below.

The results of a test are not valid for classification purposes when an early termination of the test has occurred.



#### 4.2 Observations

Run	Comm	ents
	301s:	The main burner was ignited.
	360s:	The film had begun to delaminate in the corner area. The short wing was slightly bowed.
	393s:	Surface flaming was observed along the periphery of the damaged area.
1	579s:	Non-flaming debris was observed on the trolley floor, this consisted of the charred polymeric film.
	633s:	Surface flaming was observed along the periphery of the damaged area.
	768s:	Non-flaming debris was observed on the trolley floor.
	1272s:	Non-flaming debris was observed on the trolley floor.
	302s:	The main burner was ignited.
	351s:	The film had delaminated in the flame impingement area.
	372s:	Surface flaming was observed along the periphery of the damaged area.
2	399s:	The short wing was slightly bowed in the corner area.
	693s:	Non-flaming debris was observed on the trolley floor.
	810s:	Non-flaming debris was observed on the trolley floor.
	876s:	Non-flaming debris was observed on the trolley floor.
	894s:	Non-flaming debris was observed on the trolley floor.
	301s:	The main burner was ignited.
	357s:	The film had delaminated in the flame impingement area.
	396s:	Surface flaming was observed along the periphery of the damaged area.
3	570s:	Surface flaming was observed for a duration of approximately two to three seconds.
	651s:	Surface flaming was observed at the edge of the damaged area for a duration of approximately five seconds.
	1062s:	Non-flaming debris was observed within the burner zone.
	1329s:	Non-flaming debris was observed on the trolley floor.



# 4.3 Graphical outputs and summary data

General Information		Product		
Product Identification	ARMARK PUREZONE60 self-adhesive PVC film	Sample number	E13163	
		Substrate	2mm aluminium sheet	
Standard used	BS EN 13823	Mounting	Self-adhesive	
Date of test	18/11/2020	Joints	None	
ilename	s181120c.rw1			
Report reference	P119024-1000			
		Conditioning		
aboratory		Conditioned	Yes	
aboratory name	BRE Global	Time interval	Held on file	
Operator	C A Rock	Weight 1 (g)	Held on file	
		Weight 2 (g)	Held on file	
Test Results		Wolgh 2 (g)	ricia on me	
HR <sub>600</sub>	0.84	Additional Information	1	
GRA <sub>0.2MJ</sub>	28.5	Time to FIGRA <sub>0.2MJ</sub> (s)	414	
FIGRA <sub>0.4MJ</sub>	0.0	Time to $FIGRA_{0.4MJ}$ (s)	#N/A	
SP <sub>600</sub>	6.2	Time to SMOGRA (s)	#N/A	
BMOGRA	0.0	. ,	411	
Comments	Na			
.FSedge {Y/N}	No			
FDP (f =< 10s) {Y/N}	No	Chart Lengend		
FDP (f > 10s) {Y/N}	No	B FIGRA Threshold ···		
full test duration/performed {Y/N}	Yes	C FIGRA Threshold		
Smoke Correction Used	Yes	D FIGRA Threshold		
3 2 1 0 0 0 900	1200 1500 300	360 420	480 540 600	
300 600 900	1200 1500 300	360 420		
FLC.D.A. 200c. 15:	000	TUD 2006		
FIGRA 300s-15		THR 300s		
1 0.8 0.6 0.4 0.2 0	1.5 1 0.5	THR 300s	-1500s	
1 0.8 0.6 0.4 0.2 0	1.5 1 0.5 0 30 30		-1500s 0 1100 1300 1500	



General Information		Product	
Product Identification	ARMARK PUREZONE60 self-adhesive PVC film	Sample number	E13163
	Self-auriesive PVC IIIIII	Substrate	2mm aluminium sheet
Standard used	BS EN 13823	Mounting	Self-adhesive
Date of test	18/11/2020	Joints	None
Filename	P119024-1000		
Report reference	s181120d		
		Conditioning	
Laboratory		Conditioned	Yes
Laboratory name	BRE Global	Time interval	Held on file
Operator	C A Rock	Weight 1 (g)	Held on file
To at Do suite		Weight 2 (g)	Held on file
Test Results	4.00	A LPP LL . f	
THR <sub>600</sub>	1.00	Additional Information	
FIGRA <sub>0.2MJ</sub>	31.2	Time to FIGRA <sub>0.2MJ</sub> (s)	
FIGRA <sub>0.4MJ</sub>	0.0	Time to FIGRA <sub>0.4MJ</sub> (s)	) #N/A
TSP <sub>600</sub>	24.7	Time to SMOGRA (s)	#N/A
SMOGRA	0.0		
_			
Comments	No		
LFSedge {Y/N}	No No	Chartlanand	
FDP (f =< 10s) {Y/N} FDP (f > 10s) {Y/N}	No	Chart Lengend B FIGRA Threshold	
Full test duration/performed {Y/N}	Yes	C FIGRA Threshold	
Smoke Correction Used	Yes	D FIGRA Threshold	
HRR <sub>av</sub> Specimen kW	5 4		nen kW 300-600
5 4 3 2 1	5 4 3 2 1 0		
5 4 3 2 1 0 300 600 900	1200 1500 5 4 3 2 1 1 300 300	0 360 420	480 540 600
5 4 3 2 1 0 300 600 900 FIGRA 300s-1	1200 1500 300 5500s		480 540 600
5 4 3 2 1 0 300 600 900 FIGRA 300s-1	1200 1500 5 4 3 2 1 1 300 300	0 360 420	480 540 600
FIGRA 300s-1	1200 1500 300 5500s	0 360 420	480 540 600
FIGRA 300s-1	1200 1500 2 1500s 2	0 360 420	480 540 600
5 4 3 2 1 0 300 600 900 FIGRA 300s-1	1200 1500 5 1200 1500 300	0 360 420	480 540 600
FIGRA 300s-1	1200 1500 2 1500 2 1500 2 1500 2	0 360 420	480 540 600
FIGRA 300s-1	1200 1500 1500 .500s 2 1.5 1 0.5 0	THR 300	480 540 600 Os-1500s
FIGRA 300s-1	1200 1500 1500 .500s 2 1.5 1 0.5 0	THR 300	480 540 600
FIGRA 300s-1  0  300  600  900  FIGRA 300s-1  0.8  0.6  0.4  0.2  0  300  500  700  900	1200 1500 1500 1500 1500 1500 1500 1500	THR 300	480 540 600 Os-1500s
FIGRA 300s-1  SPR <sub>av</sub> 300s-1	1200 1500 1500 1500 1500 1500 1500 1500	THR 300	480 540 600 0s-1500s 000 1100 1300 1500 GRA 300s-1500s
FIGRA 300s-1  0  300  600  900  FIGRA 300s-1  0.8  0.6  0.4  0.2  0  300  500  700  900	1200 1500 1500 1500 1500 1500 1500 1500	THR 300	480 540 600 0s-1500s 000 1100 1300 1500 6RA 300s-1500s
FIGRA 300s-1  SPR <sub>av</sub> 300s-1	1200 1500 1500 1500 1500 1500 1500 1500	THR 300	480 540 600 0s-1500s 000 1100 1300 1500 6RA 300s-1500s
FIGRA 300s-1  0.8 0.6 0.4 0.2 0.300 500 700 900  SPR <sub>av</sub> 300s-1	1200 1500 1500 5 1200 1500 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	THR 300	480 540 600 0s-1500s 000 1100 1300 1500 6RA 300s-1500s
FIGRA 300s-1  0.8 0.6 0.4 0.2 0.300 500 700 900  SPRav 300s-1	1200 1500 2 1200 1500 300 500s 2 1.5 1 0.5 0 30 500s 40 30 20	THR 300	480 540 600 0s-1500s 000 1100 1300 1500 6RA 300s-1500s
FIGRA 300s-1  0  300  600  900  FIGRA 300s-1  0.8  0.6  0.4  0.2  0  300  500  700  900  SPR <sub>av</sub> 300s-1	1200 1500 1500 1500 1500 1500 1500 1500	THR 300	480 540 600  DS-1500s  GRA 300s-1500s  1.0 0.8 0.6 0.4
FIGRA 300s-1  0.8 0.6 0.4 0.2 0.300 500 700 900  SPRav 300s-1	1200 1500 2 1200 1500 300 500s 2 1.5 1 0.5 0 30 500s 40 30 20	THR 300	480 540 600 0s-1500s 000 1100 1300 1500 6RA 300s-1500s



roduct ample number	E13163
ampio namboi	L13103
ubstrate	2mm aluminium sheet
ounting	Self-adhesive
· ·	None
ii ii 3	None
onditioning	
	Yes
me interval	Held on file
eight 1 (g)	Held on file
eight 2 (g)	Held on file
dditional Information	
me to FIGRA <sub>0.2MJ</sub> (s)	#N/A
me to FIGRA <sub>0.4MJ</sub> (s)	#N/A
	-
me to SMOGRA (s)	#N/A
nart Lengend FIGRA Threshold	
FIGRA Threshold	
FIGRA Threshold	••••
HRR <sub>av</sub> Specimer	n kW 300-600
360 420 THR 300s-	480 540 600 1500s
500 700 900	1100 1300 1500
TSP and SMOGRA	A 300s-1500s
500 700 900	1.0 0.8 - 0.6 - 0.4 - 0.2 0.0 1100 1300 1500
/	500 700 900

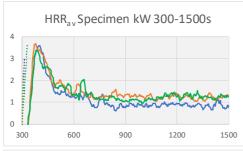


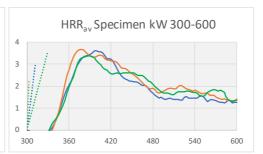
Product Identification	Run 1	Run 2	Run 3
Specimen number	E13163	E13163	E13163
Operator	C A Rock	C A Rock	C A Rock
Date of test	18-Nov-20	18-Nov-20	18-Nov-20
Filename	s181120c.rw1	P119024-1000	s181120e.rw1
THR <sub>600</sub>	0.84	1.00	0.94
FIGRA <sub>0.2MJ</sub>	28.5	31.2	0.0
FIGRA <sub>0.4MJ</sub>	0.0	0.0	0.0
TSP <sub>600</sub>	6.2	24.7	10.3
SMOGRA	0.0	0.0	0.0
Time of FIGRA <sub>0.2MJ</sub> (s)	414	408	#N/A
Time of FIGRA <sub>0.4MJ</sub> (s)	#N/A	#N/A	#N/A
LFSedge {Y/N}	N	N	N
FDP (f =< 10s) {Y/N}	N	N	N
FDP (f > 10s) {Y/N}	N	N	N
Smoke Correction Used	Yes	Yes	Yes

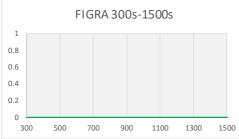
# Chart Legend Run 1 — Run 2 —

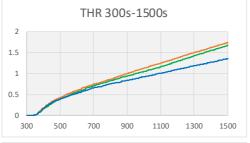
B FIGRA Threshold
C FIGRA Threshold
D FIGRA Threshold

Test Averages	
THR <sub>600</sub>	0.93
FIGRA <sub>0.2MJ</sub>	19.90
FIGRA <sub>0.4MJ</sub>	0.00
TSP <sub>600</sub>	13.72
SMOGRA	0.00
LFSedge {Y/N}	N

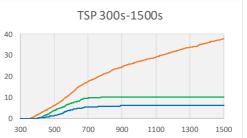














### 4.4 Photographs

# P119024-1000 (Run 1) Pre-test photographs



P119024-1000 (Run 2) Pre-test photographs





#### P119024-1000 (Run 3) Pre-test photographs



#### 5 Conclusion

EN 13823 does not contain acceptance criteria and therefore this test report does not indicate a pass or fail of the product.

#### 6 Validity

These test results relate to the behaviour of the sample in the form in which it was tested; the results do not necessarily relate to products produced as a result of further processing or refinement of the sample under test.

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 information in section 2.2 and in Appendix A of this report, other than that indicated otherwise, was supplied by the test sponsor and was not independently verified by BRE Global. The validity of the results is conditional on the accuracy of that data.

#### 7 Reference

1 EN 13823: 2010 + A1: 2014. Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item. CEN, Avenue Marnix 17, B-1000 Brussels. 2014.