# BMTRADA Test Report

### CONFIDENTIAL

**Report:** BMT/FEP/F14168 Revision A AR1

Contract reference: FEP/F15051

A fire resistance test performed on a single leaf single

acting doorset

Test conducted in accordance with BSEN 1634-1: 2014 and BSEN 1363-1: 2012

Test date: 20<sup>th</sup> November 2014

The details of the sponsor of test report BMT/FEP/F14168 Revision A are held on file by Chiltern International Fire Ltd. This report is additional to that issued as BMT/FEP/F14168 Revision A on 11<sup>th</sup> February 2014 and the original report shall remain valid and is not replaced by the additional report.

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**Sponsor:** Sealmaster Ltd Pampisford Cambridge CB2 4HG

... WHEN EXPERIENCE MATTERS

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### 1 Summary of performance

The following performance was achieved from the specimen tested. Full details of the testing and specimen construction are described in the report.

#### **Results:**

Fire resistance test in accordance with BSEN 1634-1: 2014 and BSEN 1363-1: 2012

Integrity	
Cotton pad	60 (sixty) minutes*
Continuous flaming	48 (forty eight) minutes
Gap gauges	60 (sixty) minutes*
Insulation	
Average set	48 (forty eight) minutes**
Maximum ≥ 100mm in from leaf edge	48 (forty eight) minutes**
Door frame ≥ 180°c temp rise	48 (forty eight) minutes**
Door frame ≥ 360°c temp rise	48 (forty eight) minutes**
Radiation	
Time to reach 15kW/m <sup>2</sup>	60 (sixty) minutes*

\* No failure of the test criteria had occurred at termination of the test at 60 minutes \*\* Failure by virtue of integrity failure at 48 minutes





### 2 Introduction

The doorset was installed into a flexible supporting construction. In accordance with BS EN 14600: 2005 the leaves were pre-cycled before the fire test. The doorset was instrumented with the standard and maximum sets of thermocouples and installed opening in towards the furnace.

#### **3** Specimen verification

The doorset was delivered to BM TRADA on the 17<sup>th</sup> November 2014. The component parts of the doorset were identified based on nominal information provided by the client. The conformity of the specimens against these nominal values has been verified and agreed by the laboratory insofar as the structure of the specimen allowed verification to take place. If possible, additional moisture content readings, species verification and density checks were performed on either the original specimen, or, samples provided by the sponsor. These details are outlined in the construction section of this report (section 6).

#### 3.1 Conditioning

BM TRADA stored the specimens in climatic conditions approximate to those expected in normal service, and used the guidelines of annex F.1 of BSEN 1363 – 1: 2012 to establish a suitable conditioned level where possible.

#### 3.2 Sampling

BM TRADA was not involved in factory sampling of the components used for the specimen subject to this report.



### 4 Description of supporting construction

The supporting construction comprised a British Gypsum steel stud partition built in accordance with Clause 7.2.2.4 of BSEN 1363: Part 1, for a flexible supporting construction. 50mm deep stud and track framework was used as per the requirements of group A – table 1 of the above mentioned clause 7.2.2.4 The vertical studs surrounding the apertures created for the doorsets incorporated a 47mm x 29mm softwood timber infill to facilitate the fixings for the specimens. The specimen tested is a 30 minute product with an anticipated Category B performance, therefore intended fire resistance is 36 minutes, and one layer of type F Gypsum plasterboard is therefore required. The supporting construction was only fixed on the horizontal edges, the vertical edges remained free.

### 5 Description of specimen

Details of the specimen are shown in Figures 1 to 6 of Appendix 1.

#### 5.1 Door leaf

The leaf measured 2040mm high x 926mm wide x 46mm thick.



# 6 Description of construction (refers to Figures 1 to 6 of Appendix 1)

#### Leaf

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Stiles and	rails	None fitted	-	-	-	-
Core		Falcon Panel products Ltd Strebord particleboard	44 thick	580*	9.8	1
Facings		Kraft paper veneer	Nominally 0.5 thick	-	-	2
Adhesive Lipping		PVA*	-	-	-	-
Lippings – all edges		Sapele	8 thick	640*	10.7	3

\* As stated by client, not checked by laboratory

#### Door frame

	Species/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )	Moisture (% w/w)	Key to figures
Head & jambs	Sapele	90 wide x 32 thick	640*	10.3	4
Stops – planted (pinned)	Sapele	22 wide x 12 thick	640*	10.5	5
Frame jointing detail	Mortice and tenon (screwed with 2No. 80mm long screws per joint)	-	-	-	-
Architrave	MDF	45 wide x 18 thick	-	8.6	-
Threshold	Non combustible	-	-	-	-
Frame fixings	4No. steel screws per jamb	80Ø x 100 long	-	-	-
Frame to supporting construction fire stopping	Rockwool mineral fibre capped with intumescent mastic	Nominally 10-15 wide x full depth of frame	-	-	-

\* As stated by client, not checked by laboratory



#### Intumescent materials and seals

		Make/type	Size (mm)	Location	Key to figures
Door ed	ges	None fitted	-	-	-
Frame reveal	Head and jambs	Sealmaster RetroSeal self adhesive graphite	44 x 0.55	Fitted lining the frame reveal the frame reveal	6
Acoustic/smoke seal		Sealmaster DeltaSeal smoke/acoustic seal	12 x 12	Fitted up to the upstand of the stop in the frame reveal	7
Threshold seal		Sealmaster DropSeal Product reference 2712s	12 wide x 27 high x leaf width	Fitted in the threshold of the leaf	8

#### Intumescent interruptions by hardware and additional protection

	Make/type	Size (mm)	Location
Around hinges - frame	Continuous	-	Intumescent seal fits over the hinge blade
Under hinge blade	None fitted	-	-
Encasing latch body	None fitted	-	-
Under latch forend	None fitted	-	-
Around latch keep	Continuous	-	Intumescent seal fits over top, bottom and centre latch keeps, with cut outs for the latch nibs (see Photographs)
Under latch keep	None fitted	-	-
Under drop down seal	None fitted	-	-
Under pull handle	Intumescent Seals Ltd Therm-a-Line	120 x 100 x 1 thick	Fitted on the back face of the pull handle (see photographs)
	Intumescent Seals Ltd Therm-a-Flex	120 x 20 x 1 thick	Fitted encasing the sides of the pull handle (see photographs)
Inside pull handle	Intumescent Seals Ltd Therm-a-Flex	115 x 20 x 8 thick	Fitted inside the body of the handle



#### Hardware

		Make/type	Size (mm)	Location	Key to figures
Hinges		3No.Royde and Tucker H101 stainless steel lift off type hinges	100 x 32 (blade size)	Fitted 195mm, 965mm and 1735mm from the head of the leaf, fixed with 5No. M4.3 x 24mm long steel screws per blade in frame and 54No. M4.3 x 40mm long steel screws per blade in leaf	9
Closer		Arrone AR1 500p-SEBE overhead type Ref. CLR-AGN-100	245 x 56 (footprint size)	Fitted on the exposed face as per the manufacturer's instructions	10
Latch - engage centre only	- ed at latch	Winkhaus AV2 espagnolette lock Product reference 255987/2559721	20 x 1770 (forend size)	Centre latch fitted 1050mm from the threshold of the leaf, fixed with 12No. M4.2 x 35mm long screws	11
	Upper and lower keeps	Winkhaus AV2 Product reference 4933948	24 wide x 175 high (footprint size)	Fixed with 4No. M4.1 x 25mm long screws 265mm and 1750mm from the head of the leaf	12
	Centre keep	Winkhaus AV2 Product reference 5010384/5010383	24 wide x 230 long (footprint size)	Fixed with 3No. 4.1 x 24mm long screws appropriate to the centre latch	13
Lock c	ylinder	Winkhaus XR6 Kitemark euro-profile	70 long	Fixed with 1No. M5 x 65mm long machine screw	-
Furniture		Winkhaus Palladio (Hoppe)	250 x 35 (footprint size)	Fitted appropriate to the centre latch fixed with 3No.M5 x 56mm long screws	14
		Tuscan Hardware flush pull handle	150 x 150 (footprint size) Recessed 154x154x22	Fitted on the exposed face, 610mm from the head and 130mm from the closing edge, fixed with M5x20mm long screws, rebated 22mm into the leaf face	15



### 7 Pre-test measurements and mechanical conditioning

Pre test measurements and mechanical conditioning was conducted on the sample in the order detailed below.

#### 7.1 Method of installation

The doorset was fixed into a pre-prepared opening. The details of the fixings and fire stopping between frame and supporting construction are outlined in the construction section and Figure 4 of Appendix 1. The exposed face of the doorset was flush with the exposed face of the supporting construction.

#### 7.2 **Pre-cycling operability**

Operability test of 25 manual cycles was completed on the leaf in accordance with BS EN 14600, section 5.1.1.1.

Minimum angle of opening	90°
Number of operation cycles completed	25

#### 7.3 Specimen self closing

Specimen self closing was completed on the leaf in accordance with BS EN 14600, section 5.1.1.2 / 5.1.1.3.. The doorset was deemed to comply with the closing speed requirements.

#### 7.4 Door perimeter gaps

The door was installed to open and close freely, maintaining gaps, where possible, to a range of 2-4mm along all edges except the threshold, and 3-8mm along the threshold. The gaps between the edge of the leaf and frame were measured prior to test in accordance with BSEN 1634-1 2014, section 10.1.2. A total of 12 readings were recorded. The measurements are detailed in Figure 5 of Appendix 1.

#### 7.5 Closer forces

Measured in accordance with BS EN 1634-1: 2014 Section 10.1.3.

Opening Force (Nm)	
71.9 @ handle position	

#### 7.6 Final setting

Final setting of the specimen was conducted in accordance with BSEN 1634-1 2014, section 10.1.4.



#### 8 Test conditions

#### 8.1 Ambient temperature

The ambient temperature of the test area at commencement of the test was 12°C. The ambient temperature for the duration of the test has been recorded in Appendix 2.

#### 8.2 Pressure readings

After the first 5 minutes of the test, the furnace pressure was maintained at  $0 \pm 5$  Pa and after 10 minutes was maintained at  $0 \pm 3$  Pa with respect to atmosphere, at a point 0.5m from the notional floor level. The pressure readings have been tabulated in Appendix 2 and are shown graphically below:





#### 8.3 Furnace temperature

The furnace was controlled to follow the temperature/time relationship specified in BSEN 1363: Part 1: 2012 Section 5.1.1 as closely as possible, using the average of nine plate thermometers suitably distributed within the furnace. The temperatures recorded have been tabulated in Appendix 2 and are shown graphically below:





#### 8.4 Unexposed face temperatures

The temperature of the unexposed face was monitored by means of the following thermocouples:

Doorset	1 discrete area	
Leaf	Discrete area (timber)	5 measuring mean temperature rise. 4 measuring maximum temperature rise, standard set 100mm in from the door leaf edges.
Frame		5 measuring maximum temperature rise.

The location of the thermocouples are shown in Figure 6 of Appendix 1. The temperatures recorded have been tabulated in Appendix 2 and are shown graphically below:





#### 8.5 Radiation

A radiometer was used to measure the radiation at mid height 1m away from the doorset.

The results of the radiometer have been tabulated and included in Appendix 2 and are shown graphically below:





#### 8.6 Door distortion data

The following tables show the distortion of the doors in mm with an accuracy of  $\pm 1$ mm. A positive measurement indicates distortion towards the furnace.

A negative measurement indicates distortion away from the furnace.



Leaf - (hung on the right and opening in towards the furnace)

Time	Α	В	С	D	Е	F	G	Н	I	J	K	L	М	Ν	0	Р
10	-4	-7	-14	-5	-5	-10	-3	-5	-5	-7	-7	-15	-10	-3	-6	-14
20	14	14	6	18	19	13	22	26	25	10	10	4	3	-6	-5	-12
30	31	34	26	44	42	35	45	53	52	23	22	15	12	-2	-4	-13
40	43	49	42	53	53	42	50	59	61	29	28	20	-3	-3	0	-12
50	50	59	52	60	61	49	56	66	72	34	33	9	-23	-	-	-

Where a dash (-) applies, a distortion measurement could not be taken



### 9 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes) 02.21	There is smoke issuing from the top hanging and closing corners
03 57	The smoke issuing has ceased
09.08	There is smoke issuing from the perimeter of the handle and lock.
11.34	There is discolouration at the perimeter of the handle and lock position.
20.00	There is glow and intermittent flaming at the bottom hanging corner under the leaf.
22.40	There is an increase in smoke issuing and discolouration to the perimeter of the handle and lock position.
32.22	There is smoke issuing and discolouration to the top hanging corner.
39.00	The graphite is expanding out at the top hanging and closing corners.
39.48	The right side of the lock position is charring.
41.44	There is smoke issuing and discolouration at the top closing corner.
44.03	The handle has dropped to the down position and there is smoke issuing and discolouration at the middle hinge position.
45.18	There is intermittent flaming at the threshold, approximately 150mm from the bottom closing corner.
46.46	There is glow at the latch position.
47.51	There is glow at the middle hinge position.
48.20	There is continuous flaming at the latch position, thereby constituting integrity failure.
49.10	There is continuous flaming 150mm from the bottom closing corner, thereby constituting <b>further integrity failure.</b>
51.09	There is smoke issuing and discolouration at the top half perimeter where graphite is expanding out of the gaps.
51.50	The door leaf is charring across the surface at the centre and there is burn through above the handle position.
53.42	There is glow at the burn through above the handle.

54.32 There is glow across the head.



- 54.55 There is continuous flaming across the head ignited at the latch position thereby constituting **further integrity failure**.
- 57.15 A cotton pad integrity test was performed at the burn through which failed to ignite the cotton pad. No failure.
- 57.45 There is continuous flaming across the head, thereby constituting **further integrity failure.**
- 58.42 There is glow at the top half perimeter of the leaf.
- 59.35 There is continuous flaming at the bottom hinge position, thereby constituting **further integrity failure**.
- 60.40 Test terminated.

### 10 Expression of results

Integrity	
Cotton pad	60 (sixty) minutes*
Continuous flaming	48 (forty eight) minutes
Gap gauges	60 (sixty) minutes*
Insulation	
Average set	48 (forty eight) minutes**
Maximum ≥ 100mm in from leaf edge	48 (forty eight) minutes**
Door frame ≥ 180°c temp rise	48 (forty eight) minutes**
Door frame ≥ 360°c temp rise	48 (forty eight) minutes**
Radiation	
Time to reach 15k W/m <sup>2</sup>	60 (sixty) minutes*

\* No failure of the test criteria had occurred at termination of the test at 60 minutes \*\* Failure by virtue of integrity failure at 48 minutes

#### 11 Limitations

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outline in EN 1363-1, and where appropriate EN 1363-2. Any significant deviation with respect to size, construction details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires.

The results of this test were obtained using the door to frame gaps recorded in Figure 5 of Appendix 1. The fire resistance performance of doors of this design may change if substantially different gaps are employed.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. BM TRADA will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

Signature:		Ulmmen
Name:	Robert Axe	Vincent Kerrigan
Title:	Lead Technical Officer – Fire	Technical Manager
Date of issue:	12-02-2015	12-05-3012

Revision A – amendment of the acoustic seal on page 8.

#### 12 Field of direct application of test results

The results of the test are directly applicable to similar constructions where one or more of the changes listed in BSEN 1634-1: 2014, Clause 13, are made and the construction continues to comply with that appropriate design code for its stiffness and stability. Other changes are not permitted by the document. A copy of the field of direct application is available from BM TRADA upon request.

Allowances in the change of stud depth are also documented within clause 7.2.2.4 of BSEN 1363-1: 2012.

### Photographs

#### Intumescent interruptions by hardware

Intumescent over centre latch keep



Intumescent over top and bottom latch keeps



Pull handle cut out in exposed face of leaf



Intumescent over hinge blade on frame



Intumescent on pull handle



#### Drop Down seal



#### At start of test



#### At 10 minutes



#### At 20 minutes



At 30 minutes



#### At 40 minutes



At 50 minutes



#### After 60 minutes



### Appendix 1 - figures 1 to 6













### Appendix 2 - raw test data (5 pages)

Furnace thermocouples

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 11	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C									
0	0	13	14	15	14	15	15	16	15	16	12	14	13	14	13	13	13	13	13	13
1	-5.1	226	174	125	123	190	242	217	201	247	12	13	14	14	13	13	13	13	13	13
2	3.6	404	348	277	339	412	412	399	396	419	12	13	14	14	13	13	13	13	13	13
3	-4.3	585	568	468	580	645	621	589	622	575	12	13	13	14	13	13	13	13	13	14
4	-11	605	608	525	625	664	661	626	661	618	12	13	14	14	13	13	13	13	14	14
5	0.9	558	536	488	576	599	598	590	610	598	12	13	14	14	13	13	14	14	14	14
6	0.2	582	551	503	599	626	634	620	650	618	12	13	14	14	13	13	14	14	14	14
7	0.6	600	583	521	624	650	658	639	676	637	12	13	14	14	13	13	14	14	14	14
8	0.3	618	596	537	642	665	676	666	698	665	12	14	15	14	14	13	16	15	14	14
9	0.6	616	604	543	639	660	670	660	689	655	12	15	15	14	14	13	18	16	15	14
10	0.9	623	612	553	648	670	677	667	691	652	12	15	16	14	14	14	21	18	16	15
11	1	651	646	576	680	703	706	687	709	664	12	15	18	15	14	14	24	20	17	15
12	0.5	681	678	597	714	733	735	709	731	686	12	15	20	15	14	14	28	23	18	16
13	0.4	694	696	612	731	748	744	723	744	699	12	16	21	15	14	14	32	25	19	17
14	0.1	707	706	625	740	755	750	729	751	704	12	16	23	16	15	15	36	27	20	18
15	0.3	717	714	635	749	762	753	738	757	709	12	16	24	17	15	15	40	29	22	20
16	0.3	727	720	644	756	767	758	746	761	718	12	17	24	17	15	15	43	31	23	21
17	0.4	734	731	653	764	776	768	754	771	724	12	17	25	17	16	16	44	33	25	22
18	0.1	742	735	664	773	784	772	759	777	732	12	18	26	18	18	16	47	34	26	24
19	1	750	746	673	784	791	780	770	785	742	12	18	27	19	19	16	48	36	28	26
20	0.8	759	753	685	792	800	787	776	789	749	12	18	27	19	19	17	51	38	30	27

![](_page_31_Picture_0.jpeg)

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 11	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25
min	Ра	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C									
21	-0.1	771	763	695	801	807	797	785	797	755	12	19	27	20	21	17	53	39	32	29
22	0.7	778	772	708	808	814	797	790	800	764	12	19	27	20	23	18	54	41	34	31
23	0.6	788	781	718	817	823	810	798	808	767	12	20	28	21	24	18	57	44	36	33
24	0.3	794	788	725	823	828	817	806	813	776	12	20	29	22	25	18	58	46	38	35
25	-0.2	801	795	738	831	837	820	809	817	783	12	20	29	22	26	19	60	47	40	36
26	-0.6	811	802	744	836	841	825	815	824	790	12	20	29	23	27	19	62	49	42	38
27	-0.9	816	811	752	845	847	833	822	831	798	12	20	29	24	28	20	63	51	44	40
28	-0.3	825	818	764	850	853	839	827	834	804	12	21	29	25	29	20	65	53	46	42
29	0.2	836	826	770	858	859	845	835	843	808	12	21	30	26	31	21	68	55	48	45
30	1.1	843	836	777	862	864	849	841	847	813	12	22	30	27	32	21	70	57	50	47
31	-1.3	849	842	791	870	870	848	848	850	818	12	22	30	28	33	22	72	59	52	49
32	-0.1	853	846	791	873	876	862	852	855	822	12	23	32	29	34	23	74	61	54	52
33	-0.3	861	853	801	878	879	855	856	859	828	12	24	33	30	35	23	75	63	56	54
34	0	863	857	800	882	883	864	860	863	832	12	25	34	31	34	23	76	65	58	56
35	-0.4	870	864	810	888	887	866	865	871	838	12	25	35	32	33	24	79	67	60	58
36	-0.4	874	868	813	894	892	871	870	870	841	12	26	35	33	32	24	81	68	62	61
37	0.6	899	894	861	908	913	880	884	891	860	12	27	36	33	32	25	86	70	64	63
38	-0.6	909	911	888	920	927	888	894	907	877	12	28	37	34	32	25	88	72	66	65
39	-0.4	896	903	882	901	912	878	881	899	872	12	28	37	34	33	25	91	74	68	67
40	-0.2	886	891	875	887	896	865	869	888	863	12	29	38	35	33	26	95	75	70	69
41	-0.3	883	887	872	883	892	863	866	886	859	12	30	39	36	34	26	97	76	71	71
42	0.8	893	895	878	894	902	869	875	887	865	12	31	40	37	36	27	102	78	73	73
43	-0.1	903	904	885	910	913	879	887	896	874	12	32	40	38	37	27	101	79	74	74
44	-0.5	906	909	891	917	920	885	892	903	884	12	33	41	39	38	28	98	80	76	75
45	-0.3	913	913	897	921	924	888	896	908	889	12	34	43	39	41	28	96	81	77	77

![](_page_32_Picture_0.jpeg)

Time	Chan	Chan 1	Chan 2	Chan	Chan 4	Chan 5	Chan	Chan 7	Chan	Chan	Chan	Chan	Chan	Chan	Chan 20	Chan	Chan	Chan	Chan	Chan
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
46	-0.3	918	921	903	925	930	894	902	914	891	12	35	44	40	42	29	94	82	78	77
47	-0.1	924	924	904	933	935	898	907	918	899	12	36	46	41	43	30	91	83	79	78
48	0.2	927	929	912	936	939	902	911	921	901	12	38	48	42	44	30	91	84	80	79
49	-0.3	931	933	917	938	942	907	914	926	904	12	39	53	43	45	31	95	87	81	80
50	0.7	939	938	920	943	947	911	920	927	908	12	40	52	43	47	32	103	87	82	81
51	0.3	939	939	923	944	950	914	921	930	909	12	41	53	45	49	33	107	86	83	81
52	-1.1	943	942	924	953	952	917	926	937	920	12	42	55	46	51	34	110	87	84	82
53	0.3	943	943	926	949	953	919	926	937	920	12	43	61	49	53	35	97	90	85	83
54	-0.4	947	947	930	950	955	920	927	938	918	12	42	68	51	56	35	112	95	86	83
55	-0.6	947	948	928	953	957	921	930	937	923	12	42	80	66	64	36	85	91	80	84
56	-0.3	950	949	934	954	956	925	932	940	924	12	37	78	59	60	37	74	85	81	84
57	-0.7	950	950	933	958	955	925	935	941	930	12	37	82	58	63	38	82	90	85	85
58	-0.3	951	950	934	958	959	927	936	940	928	12	36	97	83	74	39	80	97	88	85
59	-1	951	950	935	959	957	929	937	941	930	12	36	110	79	73	39	78	76	76	87
60	0	951	950	935	961	957	928	939	940	933	12	37	100	80	72	40	80	70	72	88
61	-2.4	945	945	933	954	955	928	936	939	934	12	39	163	137	91	42	73	94	71	84

Time	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31
min	°C	°C	°C	°C	°C	kw/m²
0	13	13	13	13	12	0
1	13	14	13	13	13	0
2	13	14	14	13	13	0
3	13	14	14	13	13	0
4	14	14	14	13	13	0
5	14	14	14	13	13	0
6	14	14	14	13	13	0
7	14	14	14	14	13	0
8	15	14	14	14	13	0
9	15	14	15	15	14	0
10	16	15	15	16	14	0
11	18	15	16	17	15	0
12	19	16	17	18	16	0
13	21	17	18	19	17	0
14	23	18	19	20	18	0
15	24	19	21	21	19	0
16	26	20	22	23	20	0.1
17	28	21	24	24	22	0.1
18	29	23	25	26	23	0.1
19	31	24	27	27	25	0.1
20	33	26	29	29	26	0.1
21	35	28	30	30	28	0
22	37	30	32	32	30	0.1
23	39	32	34	34	31	0.1
24	41	34	36	36	33	0.1

Time	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31
min	°C	°C	°C	°C	°C	kw/m²
25	43	37	38	38	35	0.1
26	45	39	40	40	37	0.1
27	47	41	43	42	38	0.1
28	50	44	45	44	40	0.1
29	52	46	47	47	43	0.1
30	54	49	50	49	45	0.1
31	57	52	52	51	47	0.1
32	59	54	55	54	49	0.1
33	61	57	57	56	51	0.1
34	63	60	59	58	53	0.1
35	66	62	62	61	56	0
36	68	65	64	63	58	0.1
37	70	67	66	65	60	0.1
38	72	69	69	68	62	0.2
39	74	71	71	70	64	0.1
40	76	73	72	72	66	0.2
41	78	75	74	73	68	0.1
42	80	77	76	75	70	0.2
43	82	78	78	77	72	0.2
44	83	80	79	78	73	0.2
45	84	81	80	80	75	0.2
46	85	82	81	81	76	0.2
47	86	82	82	82	78	0.2
48	87	83	83	83	78	0.2
49	88	84	84	84	80	0.2

	Chan	Chan	Chan	Chan	Chan	Chan
Time	26	27	28	29	30	31
min	°C	°C	°C	°C	°C	kw/m²
50	89	85	85	85	81	0.3
51	90	86	85	86	82	0.1
52	91	87	86	87	83	0.1
53	92	88	87	88	84	0.3
54	94	90	88	89	84	0.3
55	94	90	88	89	84	0.3
56	92	91	87	87	82	0.3
57	97	92	88	87	84	0.3
58	101	93	90	89	86	0.4
59	103	81	91	90	86	0.4
60	82	73	84	90	85	0.4
61	134	65	60	70	75	0.9

**BM TRADA provides independent certification, testing, inspection, training and technical services around the world.** We help customers large and small to prove their business and product credentials and to improve performance and compliance. With an international presence across many industry sectors, we offer a special focus and long history of technical excellence in supply chain certification, product certification and testing, and technical services to the timber, building, fire and furniture industries.

![](_page_35_Picture_2.jpeg)

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![](_page_35_Picture_5.jpeg)

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