TEST REPORT
REACTION TO FIRE TEST

Test Sponsor:
International Development Company Metal Industries – Sole Proprietorship L.L.C. (IDCMI)
Al Mafraq
P.O. Box 2621
Abu Dhabi, United Arab Emirates
T: +971 2 505 6300 | F: +971 2 582 3088
Website: www.idcuae.com

Test Material / Assembly:
3mm thick Core of Aluclad Aluminium Composite Panel

Test Standard
Accreditation

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories with:

United Kingdom Accreditation Service (UKAS) - Testing Laboratory: 4439
www.ukas.com

Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification
www.egolf.org.uk

Member of International Trade Council
www.thetradeouncil.com

Member of Association for Specialist Fire Protection
www.asfp.org.uk

Member of Centre for Window and Cladding Technology
www.cwct.co.uk

The work which is the subject of this report falls wholly or partly under the accreditations of ISO 17025 UKAS.
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1. INTRODUCTION
Determination of Reaction to fire performance of building products excluding floorings when exposed to thermal attack by a Single Burning Item (SBI) (a sand-box burner supplied with propane) in accordance with BS EN 13823:2010 +A1:2014.

2. SPONSOR
Name: International Development Company Metal Industries – Sole Proprietorship L.L.C. (IDCMI)
Address: Al Mafraq
P.O. Box 2621
Abu Dhabi, United Arab Emirates
T: +971 2 505 6300 | F: +971 2 582 3088
Website: www.idcuae.com

3. TESTING LABORATORY
Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th Streets,
Jebel Ali Industrial Area 1
Dubai, United Arab Emirates
T: +971 (0)4 821 5777
Website: www.bell-wright.com

4. DATE OF TEST
Sample received: 13-Jan-20
Test date: 10-Feb-20

The test had been witnessed by:

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Kamil Mohamed</td>
<td>Intertek Middle East</td>
<td>+971 50 951 4681</td>
</tr>
<tr>
<td>Mr. Kishore Rao</td>
<td>IDCMI</td>
<td>+971 56 315 6442</td>
</tr>
<tr>
<td>Mr. Omar Qatta</td>
<td></td>
<td>+971 50 353 9527</td>
</tr>
</tbody>
</table>
## 5. SPECIMEN DESCRIPTION

*Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test result. All information that could not be verified will be indicated by an asterisk (*) mark.*

<table>
<thead>
<tr>
<th>Product Description</th>
<th>3mm thick Core of Aluclad Aluminium Composite Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>International Development Company Metal Industries LLC</td>
</tr>
<tr>
<td>Thickness</td>
<td>3.1mm (Measured by TBWIC)</td>
</tr>
<tr>
<td>Area Density</td>
<td>5.61 kg/m² (Measured by TBWIC)</td>
</tr>
</tbody>
</table>

### Product Details

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Non-combustible Mineral-filled Core* (stated)</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Alubotec* (stated)</td>
</tr>
<tr>
<td>Thickness</td>
<td>3.1mm (Measured by TBWIC)</td>
</tr>
<tr>
<td>Area Density</td>
<td>5.61 kg/m² (Measured by TBWIC)</td>
</tr>
</tbody>
</table>

### Substrate Details

<table>
<thead>
<tr>
<th>Material</th>
<th>Calcium Silicate Board (Verified by TBWIC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>885 kg/m³ (Measured by TBWIC)</td>
</tr>
<tr>
<td>Thickness</td>
<td>12 mm (Measured by TBWIC)</td>
</tr>
<tr>
<td>Classification</td>
<td>A2-s1, d0 as per BS EN 13501-1:2018 (Verified by TBWIC)</td>
</tr>
</tbody>
</table>

### Type of joint

1. Horizontal Joints: Butt joint at 500 mm from the specimen bottom to the center of the joint, measured when the wings were mounted.
2. Vertical Joints: Butt joint at 200 mm from the corner line to the center of the joint, measured when the wings were mounted.
Refer to Drawing No.1 & 2 for more details.

### Specimen Dimensions

<table>
<thead>
<tr>
<th>Small Wing: Panel 1 – 495 x 1500 mm (w x h) (Measured)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Wing: Panel 2 – 203 x 500 mm (w x h) (Measured)</td>
</tr>
<tr>
<td>Panel 3 – 203 x 1000 mm (w x h) (Measured)</td>
</tr>
<tr>
<td>Panel 4 – 800 x 500 mm (w x h) (Measured)</td>
</tr>
<tr>
<td>Panel 5 – 800 x 1000 mm (w x h) (Measured)</td>
</tr>
</tbody>
</table>
Refer to Drawing No.1 & 2 for more information/details.

### Specimen Placement/Mounting

The specimen was prepared according to section 5.2.2 of BS EN 13823:2010+A1:2014. It was mounted mechanically using 3.5 x 25mm drywall screws and washers on a calcium silicate board substrate.

The panels were directly mounted on the substrate without an air gap behind it. The specimen was placed such that the bottom edges of the long and short wings rested against the respective U-profiles on the trolley floor, and the side edge of the short wing specimen met the extended long wing specimen at the primary burner side.
Refer to Drawing No. 1 & 2 for more details.
6. SPECIMEN DRAWING

Drawing 1: Front view of the long and short wing of test specimen.
All dimensions are in millimeters (mm)

Drawing 2: Dimensions of the long and short wing of the test specimen.
All dimensions are in millimeters (mm)
Drawing 3: Top view of the mounted specimen with airgap.
All dimensions are in millimeters (mm)

7. SPECIMEN VERIFICATION

TBWIC testing laboratory has not been involved in the selection or design of the specimen. However, the panels were selected, marked, and signed by Mr. Kamil Mohamed from Intertek Certification (Certification Body) on 22-Dec-19 as shown below. The results apply to the sample as received.

Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWIC bears no liability for the legitimacy of the submitted information.

8. METHOD OF TEST

8.1. Test Procedure

The specimen consisted of large and a small wing which were mounted on a trolley using mechanical clamps. The trolley with a sandbox burner at the bottom of the vertical corner was positioned in a frame beneath an exhaust system.

A gas burner (primary burner) with a heat release rate of 30 kW was in the corner of the small and long wing during testing. The test duration was 21 minutes. The combustion gases were collected through a hood where heat release rate and smoke production were measured instrumentally and physical characteristics were assessed by observation.
8.2. Conditioning
After delivery on 13-Jan-20, the specimens were conditioned to constant weight at 21 to 25°C and 45 to 55% relative humidity.

9. OBSERVATION
Test Data and Observation

<table>
<thead>
<tr>
<th>General Information</th>
<th>Specimen 1</th>
<th>Specimen 2</th>
<th>Specimen 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occurrence of sustained flames reaching the far edge of long wing specimen at any height between 500-1000mm at any time during the test - LFS</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Flaming droplets/particles within the first 600s</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Burning droplets/particles ≥10 s within the first 600s</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>End of test, s</td>
<td>1560</td>
<td>1560</td>
<td>1560</td>
</tr>
</tbody>
</table>

10. SUMMARY OF RESULTS
The test specimen has been evaluated in accordance with BS 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.

The complete test results for the panels are:

<table>
<thead>
<tr>
<th>TEST PARAMETERS</th>
<th>SPECIMEN 1</th>
<th>SPECIMEN 2</th>
<th>SPECIMEN 3</th>
<th>AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIGRA, W/s</td>
<td>12.8</td>
<td>10.8</td>
<td>11.9</td>
<td>11.8</td>
</tr>
<tr>
<td>(THR (t) Threshold of 0.2 MJ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIGRA, W/s</td>
<td>12.8</td>
<td>10.8</td>
<td>11.9</td>
<td>11.8</td>
</tr>
<tr>
<td>(THR (t) Threshold of 0.4 MJ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THR 600s, MJ</td>
<td>1.6</td>
<td>1.4</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>SMOGRA, m²/s²</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TSP 600s, m²</td>
<td>22.0</td>
<td>25.9</td>
<td>20.9</td>
<td>22.9</td>
</tr>
<tr>
<td>Occurrence of sustained flames reaching the far edge of long wing specimen at any height between 500-1000mm at any time during the test - LFS</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Flaming droplets/particles ≥ 10s within the first 600s</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Burning droplets/particles ≤10 s within the first 600s</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>

“The test results relate to the behavior of the test specimens of a product under the particular conditions of the test; they are not intended to be sole criterion for assessing the potential fire hazard of the product in use” - Clause 10q, BS EN 13823:2010+A1:2014.
11. LIMITATION

Results are valid for the tested configuration only.

This report and all records of the test to which it relates may be not be retained by TBWIC further than 5 years from the date of testing.

This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Prepared by: [Signature]
Sam Sancho Thomas
Fire Compliance Engineer

Reviewed & Approved by: [Signature]
Suketa Tyagi
Reaction to Fire - Manager
**APPENDIX 1 - GRAPHS**

**Heat Release Rate (HRR)\textsubscript{av}, burner excluded**

![Graph showing HRR for Specimen 1, 2, and 3 over time.]

**Smoke Production Rate (SPR)\textsubscript{av}, burner excluded**

![Graph showing SPR for Specimen 1, 2, and 3 over time.]

Heat Release Rate (HRR)\textsubscript{av}, burner excluded

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Time (Seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen 1</td>
<td>0.00 - 1.50</td>
</tr>
<tr>
<td>Specimen 2</td>
<td>0.00 - 1.50</td>
</tr>
<tr>
<td>Specimen 3</td>
<td>0.00 - 1.50</td>
</tr>
</tbody>
</table>

Smoke Production Rate (SPR)\textsubscript{av}, burner excluded

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Time (Seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen 1</td>
<td>0.00 - 0.05</td>
</tr>
<tr>
<td>Specimen 2</td>
<td>0.00 - 0.05</td>
</tr>
<tr>
<td>Specimen 3</td>
<td>0.00 - 0.05</td>
</tr>
</tbody>
</table>
Total Heat Released (THR), Burner Excluded

![Graph showing Total Heat Released (THR), Burner Excluded for Specimens 1, 2, and 3.]

Total Smoke Production (TSP), Burner Excluded

![Graph showing Total Smoke Production (TSP), Burner Excluded for Specimens 1, 2, and 3.]

Specimen 1
Specimen 2
Specimen 3

Time (Seconds)
### Fire Growth Rate Index (FIGRA)

![FIGRA Graph](image1)

### Smoke Growth Rate Index (SMOGRA)

![SMOGRA Graph](image2)

SMOGRA = $0 \frac{m^2}{s^2}$ for all three specimens
13. APPENDIX 2 - PHOTOGRAPHS

Specimen 1  Specimen 2  Specimen 3

Picture 1: Specimen before the test

Specimen 1  Specimen 2  Specimen 3

Picture 2: Specimen after the test

---- End of Test Report ----