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| <b>Report Sponsor</b>                                                                                               | <b>Issue Date</b>             |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Capstone Aluminium Sdn Bhd<br>Lot 23-26, Jalan Gangsa,<br>Pasir Gudang Industrial Estate,<br>81700, Johor, Malaysia | 5 <sup>th</sup> October, 2018 |

|                                                     |
|-----------------------------------------------------|
| <b>Test in accordance with AS/NZS 1530.1 - 1994</b> |
|-----------------------------------------------------|

| <b>Objective</b>                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To determine the performance of the material samples as described in this report when subjected to the test conditions stated in the test standard referenced below. |

| <b>Product</b> | Thermal Rock S60 Stonewool Slab |
|----------------|---------------------------------|
|----------------|---------------------------------|

| <b>Test Reference</b> | <b>Reference Date</b>            |
|-----------------------|----------------------------------|
| <b>RTF180221</b>      | 20 <sup>th</sup> September, 2018 |

| <b>Test Method</b>                                          | <b>Supplementary Standards</b> |
|-------------------------------------------------------------|--------------------------------|
| AS 1530.1:1994<br>Part 1: Combustibility test for materials | ISO 1182:2010                  |

| <b>Product Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The sponsor described the material as Thermal Rock S60 Stonewool Slab. The stone wool was supplied as compressed 50mm high cylinders. The material had a measured density of 62 kg m<sup>-3</sup> (nominal 60 kg m<sup>-3</sup>) and was green in colour. EWFA personnel were not involved in the selection of the specimens. EWFA personnel modified the specimen size to make fit the requirements for testing. Before conducting these tests, the test specimens were conditioned in a ventilated oven maintained at a temperature of 60±5°C for at least 20 and no more than 24 hours. Prior to conducting these tests the samples were cooled to room temperature in a desiccator.</p>  |

| <b>TESTING AUTHORITY</b> | Exova Warringtonfire Aus Pty Ltd                                                                                                                                                                                                                        |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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## Test Results

| Parameter                                         | Symbol or expression                          |    | Results |       |       |       |       | Arithmetic mean<br>= $\Sigma \text{results}/5$ |
|---------------------------------------------------|-----------------------------------------------|----|---------|-------|-------|-------|-------|------------------------------------------------|
|                                                   |                                               |    | 1       | 2     | 3     | 4     | 5     |                                                |
| Initial specimen mass                             | $m_{si}$                                      | g  | 5.5     | 5.5   | 5.5   | 5.5   | 5     |                                                |
| Final specimen mass                               | $m_{sf}$                                      | g  | 5.5     | 5.5   | 5.5   | 5     | 5     |                                                |
| Mass loss                                         | $Dm = (m_{si} - m_{sf})/m_{si}$               | %  | 0.0%    | 0.0%  | 0.0%  | 9.1%  | 0.0%  | 1.8%                                           |
| Total duration of sustained flaming               | Cumulative total of duration of flaming (>5s) | s  | 0       | 0     | 0     | 0     | 0     | 0                                              |
| Initial furnace thermocouple temperature          | $T_{fi}$                                      | °C | 747.4   | 745.6 | 747.2 | 745.8 | 745.0 |                                                |
| Maximum furnace couple temperature                | $T_{fm}$                                      | °C | 752.5   | 748.5 | 750.3 | 749.4 | 749.9 |                                                |
| Final thermocouple temperature                    | $T_{ff}$                                      | °C | 748.8   | 740.1 | 735.9 | 737.1 | 736.9 |                                                |
| Furnace thermocouple temperature rise             | $DT_f = T_{fm} - T_{ff}$                      | °C | 3.7     | 8.4   | 14.4  | 12.3  | 13.0  | 10.4                                           |
| Maximum specimen centre thermocouple temperature  | $T_{cm}$                                      | °C | 765.7   | 770.8 | 776.4 | 771.9 | 764.6 |                                                |
| Final specimen centre thermocouple temperature    | $T_{cf}$                                      | °C | 761.3   | 768.1 | 773.4 | 769.0 | 761.0 |                                                |
| Specimen centre thermocouple temperature rise     | $DT_c = T_{cm} - T_{cf}$                      | °C | 4.4     | 2.7   | 3.0   | 2.9   | 3.6   | 3.3                                            |
| Maximum specimen surface thermocouple temperature | $T_{sm}$                                      | °C | 783.9   | 775.1 | 787.2 | 785.7 | 774.1 |                                                |
| Final specimen thermocouple temperature           | $T_{sf}$                                      | °C | 774.7   | 762.6 | 778.5 | 777.2 | 767.4 |                                                |
| Specimen surface thermocouple temperature rise    | $DT_s = T_{sm} - T_{sf}$                      | °C | 9.2     | 12.5  | 8.7   | 8.5   | 6.7   | 9.1                                            |
| Test Duration                                     |                                               | s  | 1800    | 2100  | 1800  | 1800  | 1800  | 1860                                           |

Mean furnace temperature rise 10.4°C  
 Mean specimen centre thermocouple temperature rise 3.3°C  
 Mean specimen surface thermocouple temperature rise 9.1°C  
 Mean duration of sustained flaming 0 seconds  
 Mean mass loss 1.8%

## Criteria of Combustibility

Clause 3.4 of AS1530.1:1994 defines a combustible material as one for which; the duration of sustained flaming, as determined by summing the individual durations of flaming of 5 seconds or longer for all of the samples and dividing by five, is greater than zero, or the arithmetic mean of the temperature rise of the furnace thermocouple exceeds 50°C or the arithmetic mean of the specimen surface thermocouple temperature rise exceeds 50°C.

## Observations

No flaming was observed.

## Comments

The material is NOT DEEMED COMBUSTIBLE according to the test criteria specified in Clause 3.4 of AS1530.1:1994.

An alternative suitable insulating material was used to fill the annular space between the furnace tubes, as specified in Clause 4.2 of ISO 1182:2010.

**Conditions/Validity**

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The tests were performed at Exova Warringtonfire Aus Pty Ltd. These tests have been conducted in accordance with the test standard referenced above and this report should be read in conjunction with that standard.

This test report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the performance of the actual products supplied. These test results relate only to the behaviour of the material under the particular conditions of the test and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.