



Reaction to fire test report

Melbourne

Test standard: AS 1530.1:1994(R2016)
Test sponsor: Hobson Engineering Co Pty Ltd
Product: MPWAL Aluminium Packers
Job number: RTF230102
Test dates: 25 & 28 August 2023
Version: R1.0

Warringtonfire, accredited for compliance with ISO/IEC 17025:2017 – Testing



Bolt Tension | Anti-Vibration | Product Reliability | Traceability

hobson.com.au **QUALITY FASTENERS** SINCE 1935



211007TA






AS1530.1 Combustibility Test

Page 2 of 9



Quality management

Version	Date	Summary of amendments including reasons			
R1.0	15 September 2023	Description	Initial issue.		
		Name Signature	Prepared by	Reviewed by	Authorised by
			Anthony Rosamilia	Muntaqim Pereira	Anthony Rosamilia
					
			*Signed for and on behalf of Warringtonfire		



AS1530.1 Combustibility Test

Page 3 of 9



Contents

1.	Introduction	4
2.	Test specimens	4
3.	Test procedure	5
4.	Test results and observations	5
4.1	Test results	5
4.2	Test observations	6
4.3	Combustibility	6
5.	Application of test results	7
5.1	Validity	7
5.2	Uncertainty of measurement	7
Appendix A	Test specimen photographs	8



AS1530.1 Combustibility Test

Page 4 of 9



1. Introduction

This report documents the findings of the reaction to fire test of "MPWAL Aluminium Packers" in accordance with AS 1530.1:1994(R2016).

Warringtonfire Australia Pty Ltd (Warringtonfire) performed the test on 25 & 28 August 2023 at the request of the test sponsor listed in Table 1.

Table 1 Test sponsor details




Test sponsor	Address
Hobson Engineering Co Pty Ltd	10 Clay Place Eastern Creek NSW 2766 Australia

2. Test specimens

The description of the test specimens is detailed in Table 2. Unless otherwise specified:

- The information regarding the material composition was provided by the test sponsor.
- All measurements taken by Warringtonfire.

Table 2 Test specimen description

Item	Description																
Specimen																	
1.	<table> <tr> <td>Product name</td><td>MPWAL Aluminium Packers</td></tr> <tr> <td>Supplier</td><td>Hobson Engineering Co Pty Ltd</td></tr> <tr> <td>Material</td><td>Aluminium grade 6061-T5 (nominated)</td></tr> <tr> <td>Photograph of the received sample</td><td></td></tr> <tr> <td>Average as received density (measured)</td><td>2622 kg/m³</td></tr> <tr> <td>Density after conditioning (measured)</td><td>2622 kg/m³</td></tr> <tr> <td>Thickness of disc (measured)</td><td>10.3 mm</td></tr> <tr> <td>Colour</td><td>Reflective grey</td></tr> </table>	Product name	MPWAL Aluminium Packers	Supplier	Hobson Engineering Co Pty Ltd	Material	Aluminium grade 6061-T5 (nominated)	Photograph of the received sample		Average as received density (measured)	2622 kg/m ³	Density after conditioning (measured)	2622 kg/m ³	Thickness of disc (measured)	10.3 mm	Colour	Reflective grey
Product name	MPWAL Aluminium Packers																
Supplier	Hobson Engineering Co Pty Ltd																
Material	Aluminium grade 6061-T5 (nominated)																
Photograph of the received sample																	
Average as received density (measured)	2622 kg/m ³																
Density after conditioning (measured)	2622 kg/m ³																
Thickness of disc (measured)	10.3 mm																
Colour	Reflective grey																
Description																	
2.	<table> <tr> <td>Detailed description</td><td>The material was nominated as aluminium (6061-T5). The material was received as discs.</td></tr> <tr> <td>End use</td><td>Used as the material in a range of aluminium packers.</td></tr> </table>	Detailed description	The material was nominated as aluminium (6061-T5). The material was received as discs.	End use	Used as the material in a range of aluminium packers.												
Detailed description	The material was nominated as aluminium (6061-T5). The material was received as discs.																
End use	Used as the material in a range of aluminium packers.																

Test standard: AS 1530.1:1994(R2016)
Job number: RTF230102
Test sponsor: Hobson Engineering Co Pty Ltd



AS1530.1 Combustibility Test

Page 5 of 9



3. Test procedure

Table 3 details the test procedure for this reaction to fire test.

Table 3 Test procedure

Item	Detail
Statement of compliance	The test was performed in accordance with the requirements of AS 1530.1:1994(R2016).
Variations	<ul style="list-style-type: none"> A suitable alternative insulating material was used to fill the annular space between the furnace tubes, as specified in clause 4.2 of ISO 1182:2010. The data collection for the tests ended at the 1 second interval at which equilibrium was reached, as opposed to the following 5-minute interval as prescribed in AS 1530.1 clause 2.5.1 (h). The premature ending of the test is unlikely to have affected the results as the final and maximum temperatures were similar, and therefore unlikely to trigger a failure.
Pre-test conditioning	The specimens were conditioned inside a ventilated oven maintained at a temperature of $60 \pm 5^\circ\text{C}$ for 24 hours, and cooled to ambient temperature in a dessicator prior to testing.
Specimen preparation and mounting	Prior to testing, the discs were stacked and tied together using two fine nickel-chromium wires.
Sampling / specimen selection	The test specimens were sampled and supplied by the test sponsor. Warringtonfire was not involved in any selection or sampling procedure.
Number of tests	Five
Test operator	Anthony Rosamilia

4. Test results and observations

4.1 Test results

Table 4 shows a summary of the results for the test specimens.

Table 4 Test results

Parameter	Symbol or expression	Unit	Results					Arithmetic mean = $\sum \text{results}/5$
			1	2	3	4	5	
Total duration of sustained flaming	Cumulative total of duration of flaming (≥ 5 s)	s	0	0	0	0	0	0
Test duration		s	5376	4546	5060	4615	5517	5023
Specimen mass								
Initial specimen mass	m_{si}	g	211.3	211.4	210.9	211.6	211.7	211.4
Final specimen mass	m_{sf}	g	210.5	210.9	210.7	211.1	210.9	210.8
Mass loss	$\Delta m = (m_{si} - m_{sf})/m_{si}$	%	0.4	0.2	0.1	0.2	0.4	0.3

Test standard: AS 1530.1:1994(R2016)
 Job number: RTF230102
 Test sponsor: Hobson Engineering Co Pty Ltd



AS1530.1 Combustibility Test

Page 6 of 9

warringtonfire
Proud to be part of element



Parameter	Symbol or expression	Unit	Results					Arithmetic mean = $\sum \text{results}/5$
			1	2	3	4	5	
Furnace thermocouple temperatures								
Initial	T_{fi}	°C	749.6	751.2	748.8	751.1	748.6	749.9
Maximum	T_{fm}	°C	750.2	749.5	750.0	760.7	764.1	755.0
Final	T_{ff}	°C	743.6	736.4	743.8	754.3	759.2	747.5
Temperature rise	$\Delta T_f = T_{fm} - T_{ff}$	°C	6.6	13.2	6.4	6.4	4.9	7.5
Specimen centre thermocouple temperatures								
Maximum	T_{cm}	°C	703.1	691.5	698.1	696.9	687.3	695.4
Final	T_{cf}	°C	693.4	677.3	695.2	688.9	677.3	686.4
Temperature rise	$\Delta T_c = T_{cm} - T_{cf}$	°C	9.7	14.2	2.9	8.0	10.0	9.0
Specimen surface thermocouple temperatures								
Maximum	T_{sm}	°C	762.9	750.7	762.6	758.8	762.6	759.5
Final	T_{sf}	°C	750.1	738.0	755.2	749.4	758.0	750.1
Temperature rise	$\Delta T_s = T_{sm} - T_{sf}$	°C	12.8	12.7	7.4	9.4	4.6	9.4

4.2 Test observations

- The specimens started melting after 30 minutes from the start of the test and by tests end the specimens were no longer in contact with the specimen surface and centre thermocouples for all tests.
- As the specimen centre and specimen surface thermocouples were no longer in contact with the specimen, the data from these thermocouples may not be reliable for the purpose of specimen centre and surface temperature measurements.
- Due to the specimen melting and dripping through the cone, the removal process may have caused some debris to not be accounted into the final mass of all specimens. The specimen mass loss values may not be accurate due to this.

4.3 Combustibility

This material is not deemed combustible according to the test criteria for combustibility specified in clause 3.4 of AS 1530.1:1994 (R2016).

A comparison between the performance criteria and the corresponding results determined from testing is presented in Table 5.

Table 5 Performance criteria

Combustibility Performance Criteria	Measured value	Unit	Result
Mean duration of sustained flaming > 0 s	0	s	Pass
Mean furnace thermocouple temperature rise $\Delta T_f > 50$ °C	8	°C	Pass
Mean specimen surface thermocouple temperature rise $\Delta T_s > 50$ °C	9	°C	Pass

Test standard: AS 1530.1:1994(R2016)
Job number: RTF230102
Test sponsor: Hobson Engineering Co Pty Ltd

Bolt Tension | Anti-Vibration | Product Reliability | Traceability

hobson.com.au **QUALITY FASTENERS** SINCE 1935



211007TA



AS1530.1 Combustibility Test

Page 7 of 9



5. Application of test results

5.1 Validity

This document is the original version of this test report and is written in English. In case of doubt the original version prevails over a translation. This document is issued subject to Warringtonfire's standard terms and conditions, which are available at: [Terms and Conditions | Element](#).

These test results relate only to the behaviour of the test specimens 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.

Reports are statements of fact prepared in accordance with the referenced version of the standards stated in Section 3 of this report. Reports are based upon the information provided to Warringtonfire. Warringtonfire takes no responsibility for the accuracy or completeness of such information.

The results stated in this report apply to the sample as received. Any differences in composition, production process, thickness, density or colour of the product may significantly affect the performance and will therefore invalidate the application of the test results to the variant product. It is recommended that any proposed variation to the tested configuration or product should be referred to the test sponsor. The test sponsor should then obtain appropriate documentary evidence of compliance from Warringtonfire or another accredited testing authority. The supplier of the product is responsible for ensuring that the product which is supplied for use is identical to the test specimens that were tested.

This report may only be reproduced in full. Extracts or abridgements shall not be published without the express written permission of Warringtonfire.

The report is issued for the benefit of Warringtonfire's direct customer only, and may not be relied upon by any third parties without Warringtonfire's express written consent.

5.2 Uncertainty of measurement

Because of the nature of reaction to fire testing and the consequent difficulty in quantifying the uncertainty of measurements obtained from a reaction to fire test, it is not possible to provide a stated degree of accuracy of the result.

Test standard: AS 1530.1:1994(R2016)
Job number: RTF230102
Test sponsor: Hobson Engineering Co Pty Ltd

Bolt Tension | Anti-Vibration | Product Reliability | Traceability

hobson.com.au **QUALITY FASTENERS SINCE 1935**



211007TA



AS1530.1 Combustibility Test

Page 8 of 9

warringtonfire
Proud to be part of element



Appendix A Test specimen photographs



Figure 1: Specimen prior to testing



Figure 2: Specimen after testing

Test standard: AS 1530.1:1994(R2016)
Job number: RTF230102
Test sponsor: Hobson Engineering Co Pty Ltd

Bolt Tension | Anti-Vibration | Product Reliability | Traceability

hobson.com.au **QUALITY FASTENERS** SINCE 1935



AS1530.1 Combustibility Test

Page 9 of 9

warringtonfire
Proud to be part of 



Registered office:

Warringtonfire Australia Pty Ltd
Registered Company No. ABN 81 050 241 524

Name & address of issuing laboratory:

Warringtonfire Australia Pty Ltd
409-411 Hammond Road, Dandenong South VIC 3175, Australia

Location of performance of laboratory activities:

Warringtonfire Australia Pty Ltd
409-411 Hammond Road, Dandenong South VIC 3175, Australia

Reaction to Fire laboratory locations:

Frankfurt, Germany
DAkkS accredited laboratory D-PL-18354-01-00
T: +49 69 506 089445

Gent, Belgium
BELAC accredited laboratory 196-TEST
T: +32 9 243 77 50

Melbourne, Australia
NATA accredited laboratory 3277
T: +61 3 9767 1000

Warrington, United Kingdom
UKAS accredited laboratory 0249
T: +44 (0) 1925 655 116

General conditions of use

The data, methodologies, calculations and results documented in this report specifically relate to the tested specimen/s and must not be used for any other purpose. This report may only be reproduced in full. Extracts or abridgements must not be published without permission from Warringtonfire.

All work and services carried out by Warringtonfire are subject to, and conducted in accordance with, our standard terms and conditions. These are available on request or at <https://www.element.com/terms/terms-and-conditions>.