

**FIRE-RESISTANCE TEST  
ON DOWNLIGHT COVERS INSTALLED IN  
PLASTERBOARD CEILINGS**

**Report number FSP 1290B**

**CSIRO job number LP46ASP3085**

**Date of issue 26 MARCH 2014**

(SUPERSEDES ISSUE DATED 30 NOVEMBER 2007)

***Client***

**EFFICIENCY MATRIX PTY LTD**

**Commercial-in-confidence**

“Copyright CSIRO 2014 ©”

Copying or alteration of this report without written authorisation from CSIRO is forbidden.



**CSIRO – MATERIALS SCIENCE AND ENGINEERING**  
**14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113**  
**Ph: 02 9490 5444 Fax: 02 9490 5528**



This laboratory is accredited (Accreditation No.165, Corporate Site No. 3625) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

## Use of this Report

### **Use of Reports – Testing**

*This report is subject to binding obligations under which it was prepared. In particular, the Report must not be used:*

- *as a means of endorsement; or*
- *in a company prospectus or notification to a Stock Exchange document for capital raising, without the prior written consent of CSIRO.*

*The Report may be published verbatim and in full, provided that a statement is included on the publication that it is a copy of the Report issued by CSIRO.*

*Excerpts of the Report may not be published.*

### **Use of Reports – Consultancy**

*This report is subject to binding obligations under which it was prepared. In particular, the Report may only be used for the following purposes:*

- *the information in the Report may be used by the party that commissioned the Report for its internal business operations (but not licensing to third parties);*
- *the report may be copied for distribution within the organisation that commissioned the Report;*
- *copies of the Report (or extracts of the Report) may be distributed to contractors and agents of the organisation that commissioned the Report who have a need for the Report for its internal business operations. Any extracts of the Report distributed for this purpose must clearly note that the extract is part of a larger Report held by the organisation that commissioned the Report and which has been prepared by CSIRO.*

*The name, trade mark or logo of the CSIRO must not be used without the prior written consent of CSIRO.*

*The Report must not be used as a means of endorsement without the prior written consent of CSIRO.*

## Copyright and Disclaimer

© 2014 CSIRO To the extent permitted by law, all rights are reserved and no part of this publication covered by copyright may be reproduced or copied in any form or by any means except with the written permission of CSIRO.

## Important Disclaimer

CSIRO advises that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.



## Table of Contents

<b>SUMMARY</b>	<b>4</b>
<i>IDENTIFICATION OF SPECIMEN:</i>	4
SPONSOR:	4
MANUFACTURER:	4
TEST STANDARD:	4
TEST NUMBER:	4
TEST DATE:	4
<i>DESCRIPTION OF SPECIMEN:</i>	4
GENERAL	4
CEILING SYSTEM	4
DIMENSIONS	6
ORIENTATION	6
<i>DOCUMENTATION:</i>	6
EQUIPMENT:	7
AMBIENT TEMPERATURE:	7
DEPARTURE FROM STANDARD:	7
TERMINATION OF TEST:	7
TEST RESULTS:	8
CRITICAL OBSERVATIONS	8
FURNACE TEMPERATURE	9
SPECIMEN TEMPERATURE	9
PERFORMANCE	9
FIRE-RESISTANCE LEVEL (FRL):	10
<b>APPENDICES</b>	<b>11</b>
APPENDIX 1	11
Photograph 1 - Exposed face of the specimen prior to testing	11
Photograph 2 - Unexposed face of the specimen prior to testing	11
Photograph 3 - Specimen at 24 minutes into the test	12
Photograph 4 - Sample 3 at 53 minutes into the test	12
Photograph 5 - Specimen at 60 minutes into the test	13
Photograph 6 - Specimen at 91 minutes into the test	13
Photograph 7 - Specimen at the completion of testing	14
Photograph 8 - Exposed face of the specimen after the completion of testing	14
APPENDIX 2	16
Figure 1- Furnace temperature	16
Figure 2 - Specimen temperature – SAMPLE 1	17
Figure 3 - Specimen temperature – SAMPLE 2	18
Figure 4 - Specimen temperature – SAMPLE 3	19
APPENDIX 3	20
Drawing 1	21
Drawing 2	22
Drawing 3	23
APPENDIX 4	24
Copy of Certificate of Test - No.2060B	24
Copy of Certificate of Test - No.2061B	25
Copy of Certificate of Test - No.2062B	26
Copy of Certificate of Test - No.2063B	27



**SPONSORED INVESTIGATION No. FSP 1290B  
FIRE-RESISTANCE TEST ON DOWNLIGHT COVERS INSTALLED IN  
PLASTERBOARD CEILINGS**

**SUMMARY****IDENTIFICATION OF SPECIMEN:**

The sponsor identified the specimen as four downlight covers protecting downlight assemblies and an open cut-out in a plasterboard ceiling system.

**SPONSOR:** Efficiency Matrix Pty Ltd  
14 Ondine Drive  
Wheelers Hill VICTORIA

**MANUFACTURER:** Chengdu SHUOWU Technology Co. Ltd.  
Guixi Industrial Zone, High-tech District,  
Chengdu, Sichuan, China, 610041

**TEST STANDARD:** Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005, Fire-resistance tests of elements of construction.

**TEST NUMBER:** FS 3941/3085

**TEST DATE:** The fire-resistance test was conducted on 16 October 2007.

**DESCRIPTION OF SPECIMEN:****GENERAL**

The specimen comprised downlight covers, protecting three different downlight assemblies and one open round cut-out installed in an 1150-mm x 1150-mm sized plasterboard lined ceiling system.

**CEILING SYSTEM**

The ceiling system comprised 150-mm x 60-mm timber ceiling joists installed at nominally 600-mm centres, lined on the exposed face with three layers of 16-mm thick CSR Fyrcheck plasterboard sheets. The plasterboard sheeting was screw fixed to the timber ceiling joists using plasterboard screws at nominally 200-mm centres. Each downlight assembly was installed in the ceiling system centrally between ceiling joists and were separated from each other by a distance of nominally 575-mm.



#### Sample 1 – Small Basic Mitt 150-mm

Sample 1 comprised a Small Basic Mitt 150-mm protecting a standard “gimble type” recessed downlight assembly. The downlight assembly, 50-mm in diameter, was recessed into the plasterboard ceiling through a 70-mm diameter opening, and retained in place using spring metal clips.

On the unexposed face of the ceiling, the downlight assembly was protected by a 150-mm Small Basic Mitt. The hood was made out of 10-mm thick intumescent based material, formed into a conical shape, measuring 150-mm in diameter at its base and 160-mm in height. The hood incorporated small oval openings, four of which were located at 85-mm from the base and two at 130-mm from the base.

The 150-mm Small Basic Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the exposed edge of the cut opening and the downlight metal fascia housing, as shown in drawing numbered 1, dated 16 October 2007, by Efficiency Matrix Pty Ltd.

#### Sample 2 – Basic Mitt 200-mm

Sample 2 comprised a Basic Mitt 200-mm protecting a standard “gimble type” recessed downlight assembly. The downlight assembly, 65-mm in diameter, was recessed into the plasterboard ceiling through a 90-mm diameter opening, and retained in place using spring metal clips.

On the unexposed face of the ceiling, the downlight assembly was protected by a 200-mm Basic Mitt. The hood was made out of 10-mm thick intumescent based material, formed into a conical shape, measuring 200-mm in diameter at its base and 210-mm in height. The hood incorporated small oval openings, four of which were located at 120-mm from the base and two at 195-mm from the base.

The Basic Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the exposed edge of the cut opening and the downlight metal fascia housing, as shown in drawing numbered 1, dated 16 October 2007, by Efficiency Matrix Pty Ltd.

#### Sample 3 – Large Ventilated Loft Mitt 250-mm

Sample 3 comprised a Large Ventilated Loft Mitt 250-mm protecting a standard “gimble type” recessed downlight assembly. The downlight assembly, 75-mm in diameter, was recessed into the plasterboard ceiling through a 105-mm diameter opening, and retained in place using spring metal clips.

On the unexposed face of the ceiling, the downlight assembly was protected by a 250-mm Large Ventilated Loft Mitt. The hood was made out of 12-mm thick in tumescent based material, formed into a conical shape, measuring 250-mm in diameter at its base and 270-mm in height. The hood incorporated small oval openings, four of which were located at 140-mm from the base and two at 235-mm from the base.

The Large Ventilated Loft Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the exposed edge of the cut opening and the downlight metal fascia housing, as shown in drawing numbered 1, dated 16 October 2007, by Efficiency Matrix Pty Ltd.

#### Sample 4 – Basic Mitt 200-mm

Sample 4 comprised a Basic Mitt 200-mm protecting a clear 90-mm diameter opening in the plasterboard ceiling.

On the unexposed face of the ceiling, the opening was protected by a 200-mm Basic Mitt. The hood was made out of 10-mm thick in tumescent based material, formed into a conical shape, measuring 200-mm in diameter at its base and 210-mm in height. The hood incorporated small oval openings, four of which were located at 120-mm from the base and two at 195-mm from the base.

The Basic Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the plasterboard sheets.

#### DIMENSIONS

The overall dimensions of the plasterboard ceiling was 1150-mm square, to suit the opening in the specimen containing frame.

#### ORIENTATION

The specimen was tested with the ceiling and light fittings exposed to fire from underside.

#### DOCUMENTATION:

The following documents were supplied by the sponsor as a complete description of the specimen and should be read in conjunction with this report:

Drawings numbered 1, 2 and 3, all dated 16 October 2007, by Efficiency Matrix Pty Ltd.

Confidential information about the test specimen has been submitted and is retained at CSIRO Materials Science and Engineering.

**EQUIPMENT:****FURNACE**

The furnace had a nominal opening of 1000-mm x 1000-mm for attachment of vertical or horizontal specimens.

The furnace was lined with refractory bricks and materials with the thermal properties as specified in AS 1530.4-2005 and was heated by combustion of a mixture of natural gas and air.

**TEMPERATURE**

The temperature in the furnace chamber was measured by four type K, 3-mm diameter, 310 stainless steel Mineral Insulated Metal Sheathed (MIMS) thermocouples. Each thermocouple was housed in high-nickel steel tubes opened at the exposed end.

The temperatures of the specimen were measured by glass-fibre insulated and sheathed K-type thermocouples with a wire diameter of 0.5-mm.

**PRESSURE**

The furnace pressure was measured by a differential low-pressure transducer with a range of  $\pm 50$  Pa.

**MEASUREMENT SYSTEM**

The primary measurement system comprised a multiple-channel data loggers, scanning at one minute intervals during the test.

**AMBIENT TEMPERATURE:**

The temperature of the test area was 26°C at the commencement of the test.

**DEPARTURE FROM STANDARD:**

There were no departures from the requirements of AS 1530.4-2005.

**TERMINATION OF TEST:**

The test was terminated at 121 minutes by agreement with the sponsor.



## TEST RESULTS:

## CRITICAL OBSERVATIONS

The following observations were made during the fire-resistance test:

- 3 minutes - Smoke is being emitted from Samples 1, 2 and 4.
- 4 minutes - Smoke quantity has increased from Sample 2.
- 6 minutes - Smoke is being emitted from the base of Sample 3.
- 10 minutes - Charring on the plasterboard, around the base of Sample 3.
- 11 minutes - Smoke quantity emitted from Sample 3 has decreased.
- 22 minutes - Some discolouration of plasterboard is visible around the bases of Samples 1 and 3 (photograph 3).
- 32 minutes - All samples have risen up from the unexposed face of the plasterboard ceiling, as the specimen material intumesces.
- 44 minutes - Red glow is visible around the base of Sample 3 (photograph 4).
- 54 minutes - Cotton wool pad test (CWPT) applied to the base of Sample 3 – no ignition of cotton wool noted.
- 62 minutes - Roving thermocouple applied to the area adjacent to the base of Sample 3.
- 63 minutes - Insulation Failure of Sample 3 – maximum temperature rise limit of 180K is exceeded on the plasterboard adjacent to the sample.
- 79 minutes - Red glow is visible around the base of Sample 4.
- 86 minutes - Cotton wool pad test (CWPT) applied to the base of Sample 3 – no ignition of cotton wool noted.
- 100 minutes - Red glow is visible around the base of Sample 1.
- 102 minutes - Insulation Failure of Sample 4 – maximum temperature rise limit of 180K is exceeded on the plasterboard adjacent to the specimen.
- 104 minutes - Large red glow is visible around the base of Sample 4.
- 105 minutes - Insulation Failure of Sample 1 – maximum temperature rise limit of 180K is exceeded on the face of the specimen.  
Cotton wool pad test (CWPT) applied to the base of Sample 4 – no ignition of cotton wool noted.
- 108 minutes - Two thin cracks have developed at the base of Sample 3.





- 109 minutes - One thin crack has developed at the base of Sample 4.
- 111 minutes - Insulation Failure of Sample 2 – maximum temperature rise limit of 180K is exceeded on the plasterboard adjacent to the specimen.
- 121 minutes - Test terminated.

#### FURNACE TEMPERATURE

Figure 1 shows the standard curves of temperature versus time for heating the furnace chamber and the actual curves of average and maximum temperature versus time recorded during the heating period.

#### SPECIMEN TEMPERATURE

Figure 2 shows the curve of maximum temperature versus time associated with Sample 1.

Figure 3 shows the curve of maximum temperature versus time associated with Sample 2.

Figure 4 shows the curve of maximum temperature versus time associated with Sample 3.

Figure 5 shows the curve of maximum temperature versus time associated with Sample 4.

#### PERFORMANCE

Performance observed in respect of the following AS 1530.4-2005 criteria:

##### SAMPLE 1 – Small Basic Mitt 150-mm

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	105 minutes

##### SAMPLE 2 – Basic Mitt 200-mm

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	111 minutes

##### SAMPLE 3 – Large Ventilated Loft Mitt 250-mm

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	63 minutes



SAMPLE 4 – Basic Mitt 200-mm

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	102 minutes

This report details methods of construction, the test conditions and the results obtained when specific element of construction described herein was tested following the procedure outlined in this standard. Any significant variation with respect to size, constructional 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.

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.

**FIRE-RESISTANCE LEVEL (FRL):**

For the purpose of building regulations in Australia, the FRL's of the test specimen were as follows:

Sample 1	-	-/120/90;
Sample 2	-	-/120/90;
Sample 3	-	-/120/60 and
Sample 4	-	-/120/90

The fire-resistance level of the specimen is applicable when the system is exposed to fire from the same side as tested.

For the purposes of AS 1530.4-2005 the results of these fire tests may be used to directly assess fire hazard, but it should be noted that a single test method will not provide a full assessment of fire hazard under all fire conditions.

**TESTED BY:**

Chris Wojcik  
Testing Officer



Brett Roddy  
Team Leader, Fire Testing and Assessments

26 March 2014  
(SUPERSEDES ISSUE DATED 30 NOVEMBER 2007)



## APPENDICES

### APPENDIX 1



Photograph 1 - Exposed face of the specimen prior to testing



Photograph 2 - Unexposed face of the specimen prior to testing





Photograph 3 - Specimen at 24 minutes into the test

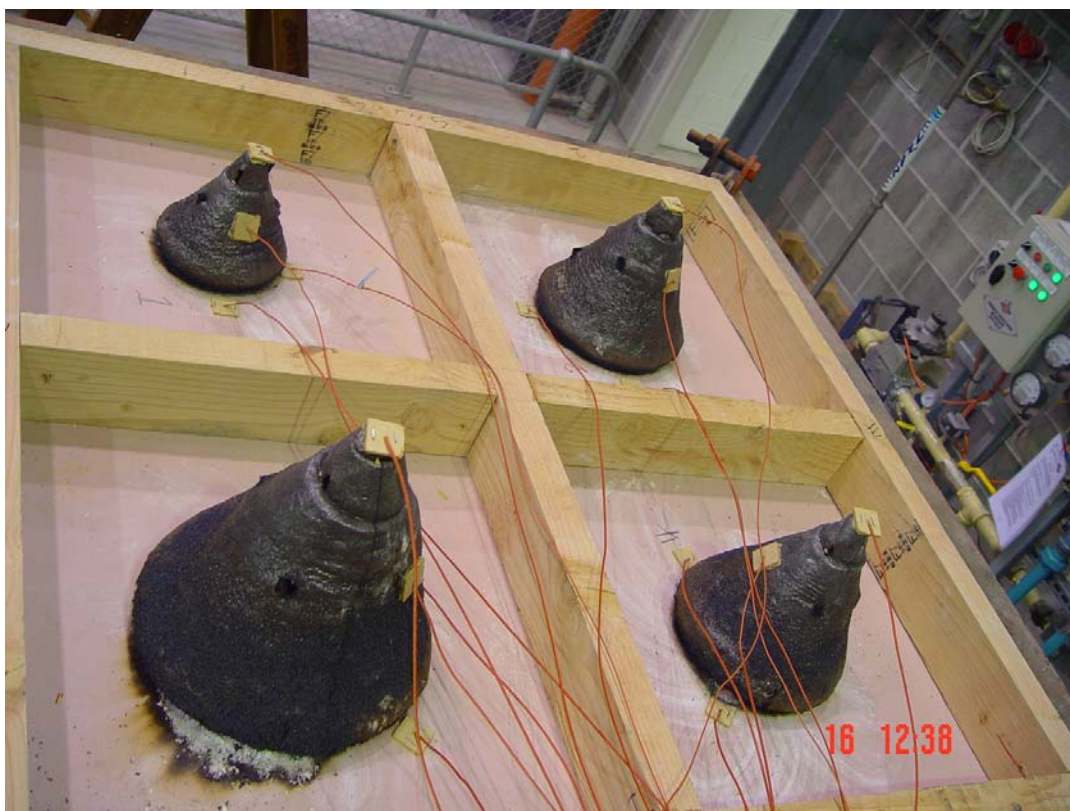


Photograph 4 - Sample 3 at 53 minutes into the test





Photograph 5 - Specimen at 60 minutes into the test



Photograph 6 - Specimen at 91 minutes into the test





Photograph 7 - Specimen at the completion of testing



Photograph 8 - Exposed face of the specimen after the completion of testing

## APPENDIX 2



Figure 1- Furnace temperature



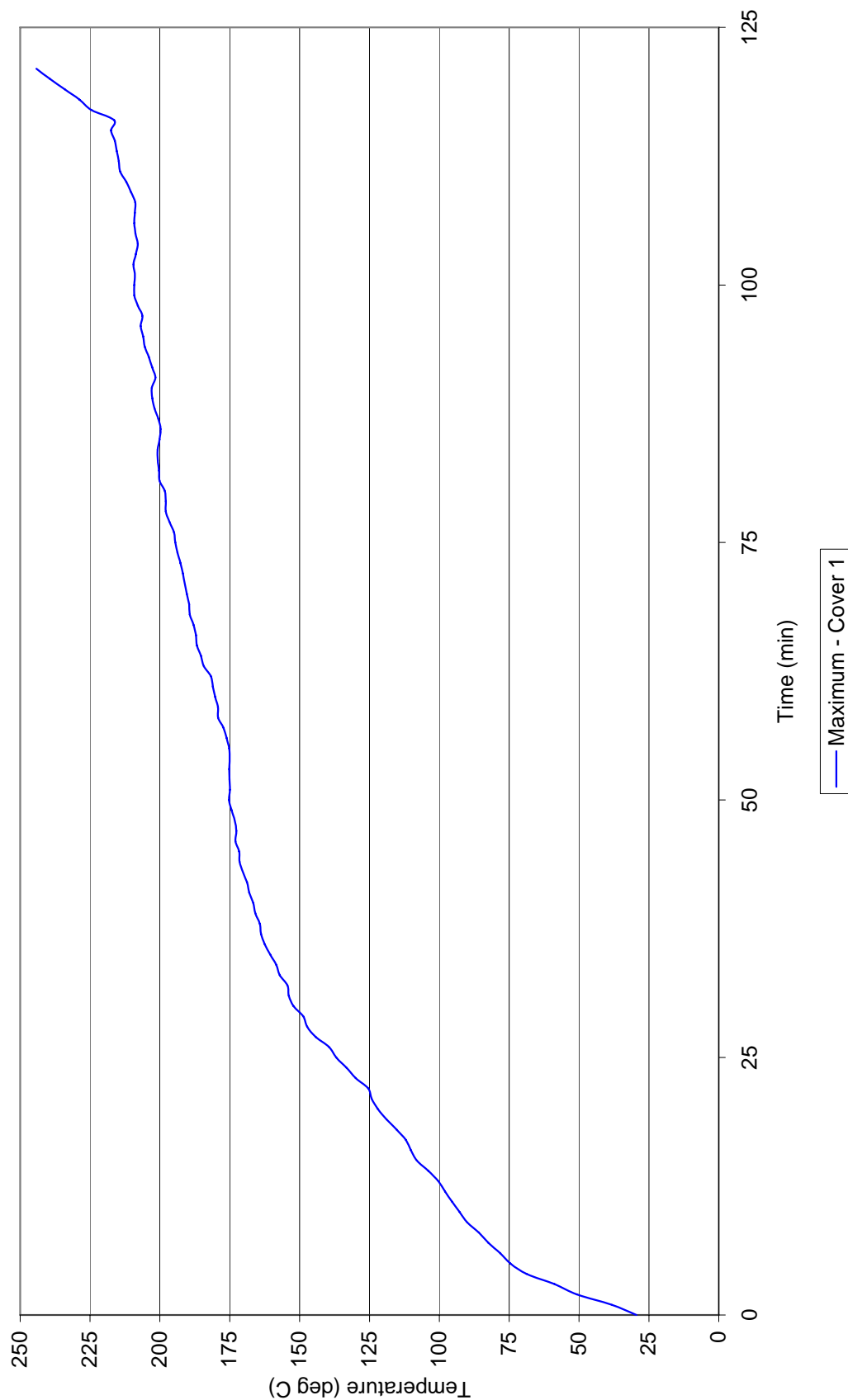


Figure 2 - Specimen temperature – SAMPLE 1





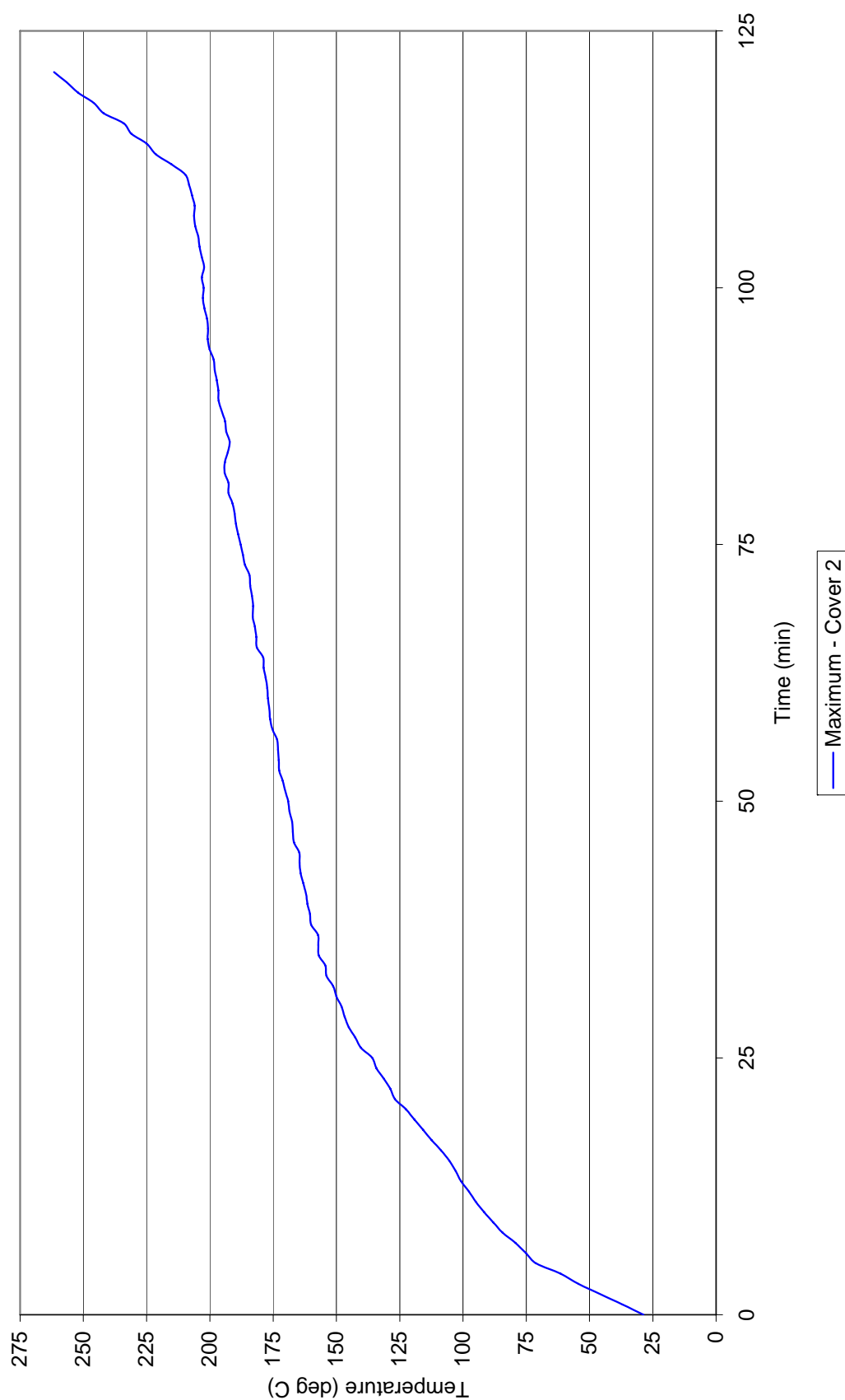


Figure 3 - Specimen temperature – SAMPLE 2



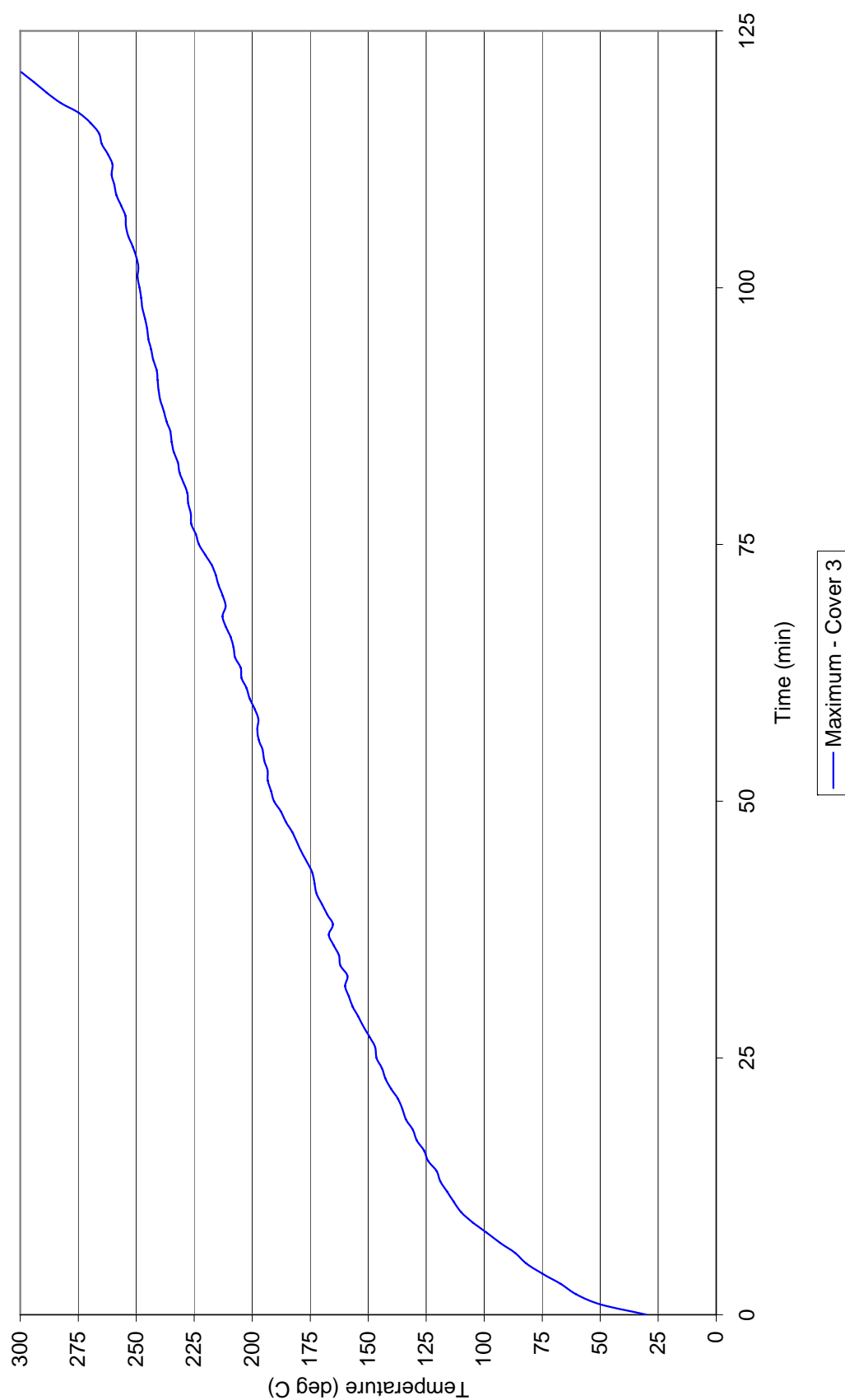


Figure 4 - Specimen temperature – SAMPLE 3



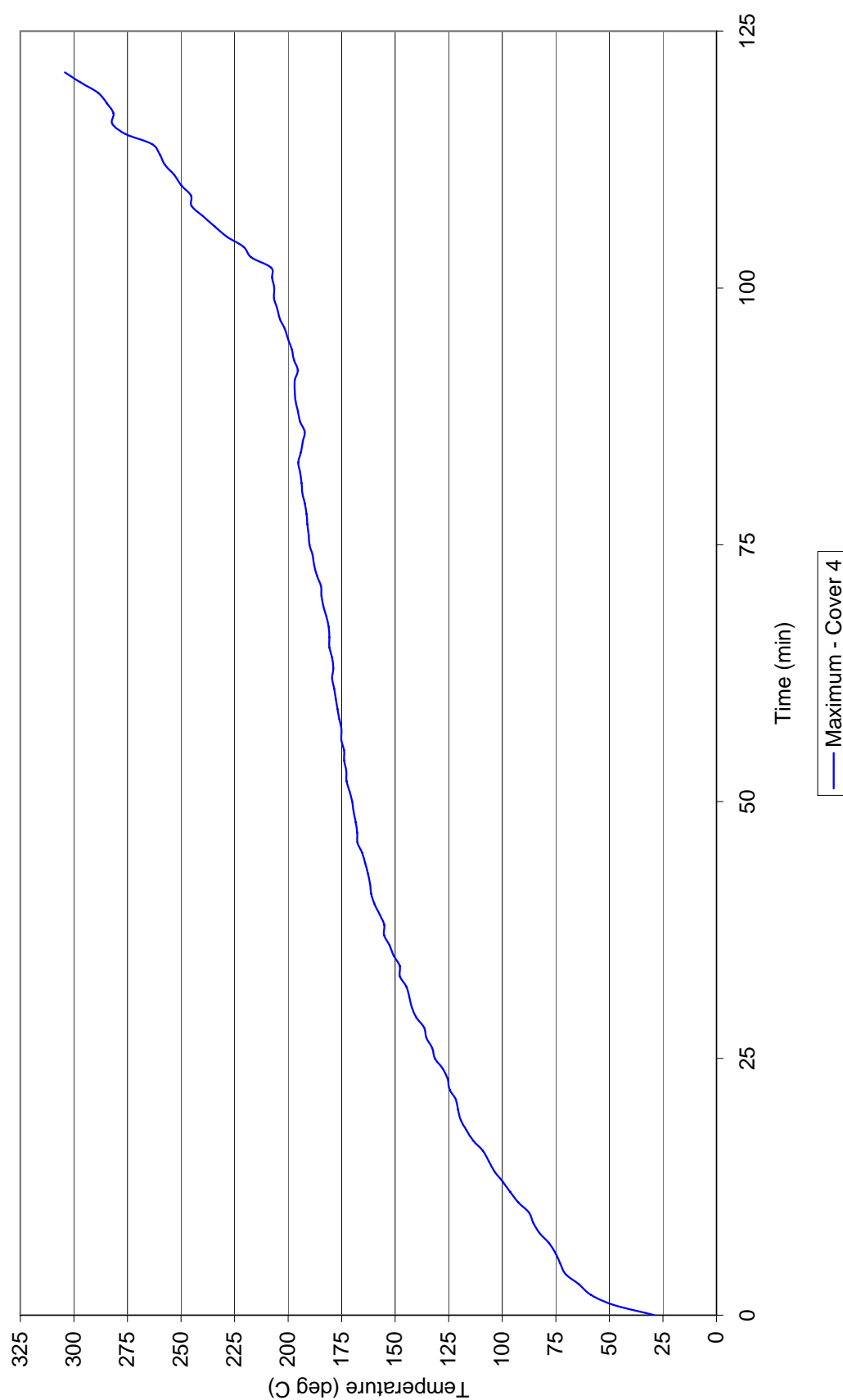
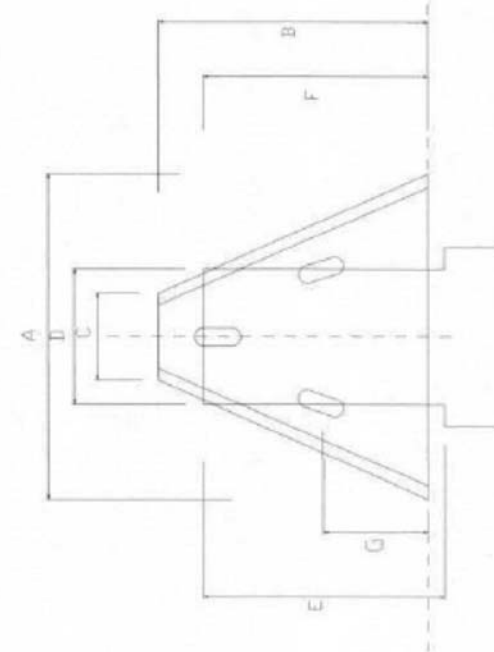


Figure 5 - Specimen temperature – SAMPLE 4  
APPENDIX 3



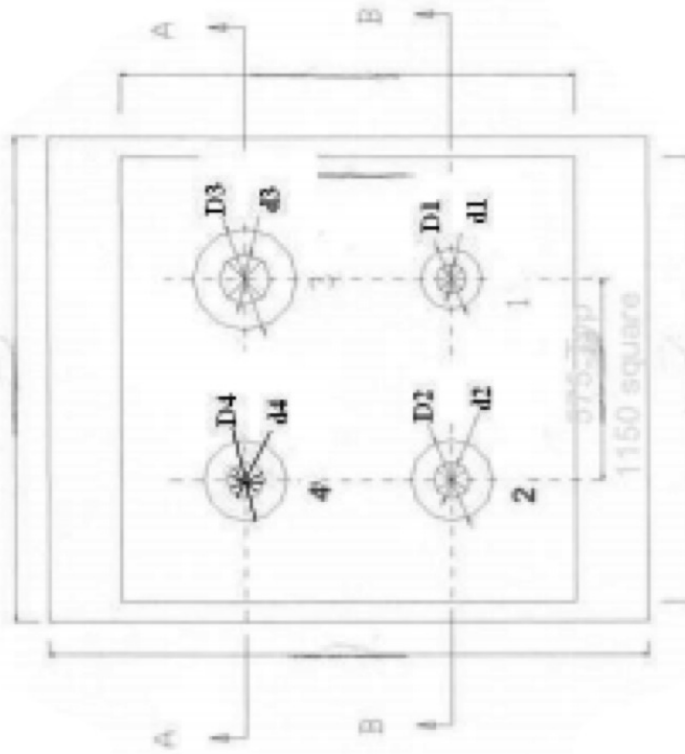
## Drawing 1

Efficiency Matrix Mitt Products  
Specification Drawing No.1, Date: 16 Oct, 2007



Mitt	SMALL	MIDDLE	LARGE
A	150	200	250
B	160	210	270
C	30	30	30
D	50	50	70
E	130	195	235
F	125	190	230
G	85	120	140
Wall Thk	10	10	12

Efficiency Matrix Mitt Products  
Specification Drawing No.2, Date: 16 Oct, 2007



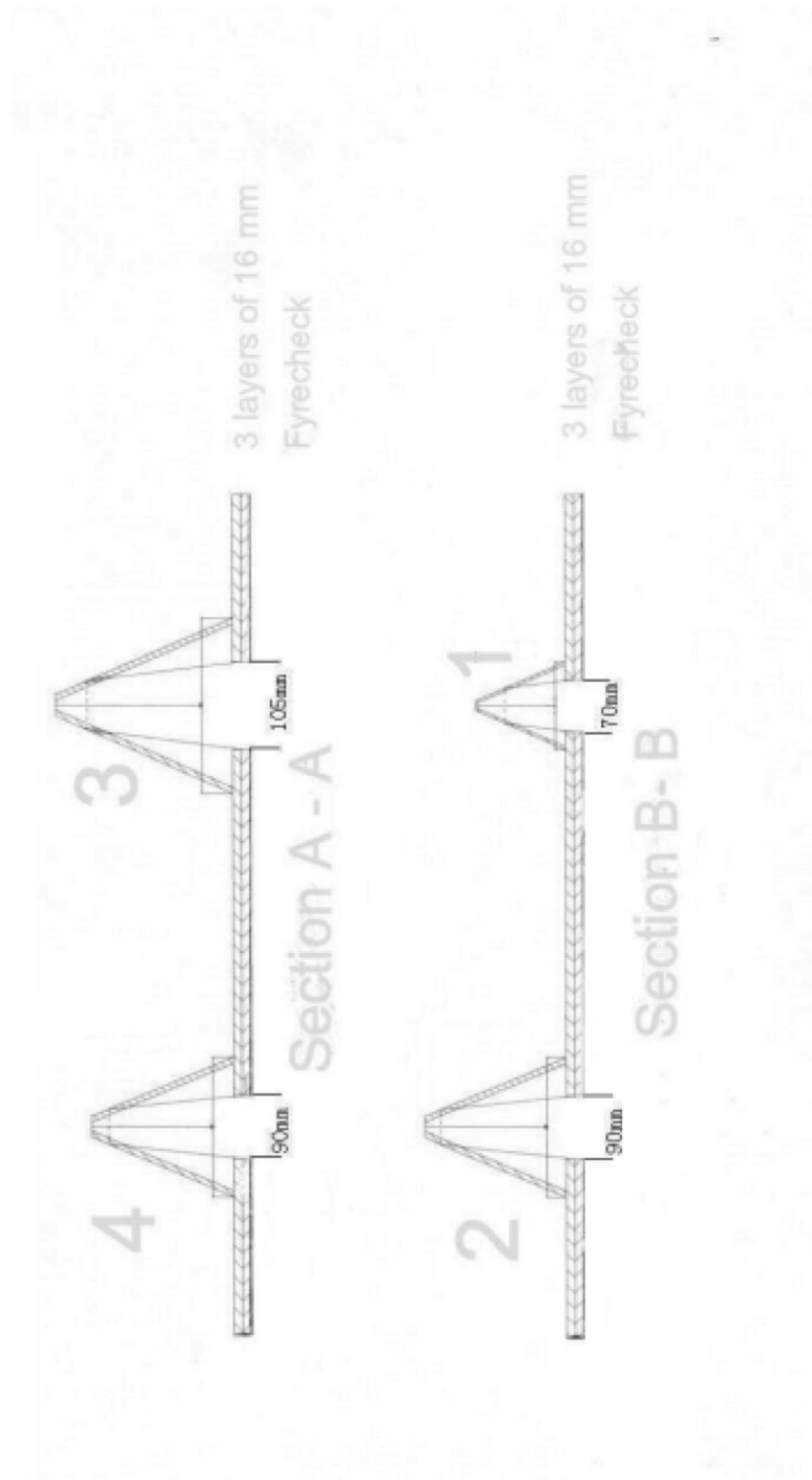
NOTE:

1. 150 SMALL VENTILATED DOWNLIGHT MITT WITH 50mm (d1) DOWNLIGHT FITTED, Cutout DIA is 70mm (D1)
2. 200 VENTILATED DOWNLIGHT MITT/BASIC MITT WITH 65mm (d2) DOWNLIGHT FITTED, Cutout DIA is 90mm (D2)
3. 250 VENTILATED LOFT MITT WITH 75mm (d3) DOWNLIGHT FITTED, Cutout DIA is 105mm (D3)
4. 200 VENTILATED DOWNLIGHT MITT/BASIC MITT WITHOUT DOWNLIGHT (d4), Cutout DIA is 90mm (D4)

## Plan of test Speciman

Drawing 2

Efficiency Matrix Mitt Products  
Specification Drawing No.3, Date: 16 Oct, 2007






NOTE:

1. 150 SMALL VENTILATED DOWNLIGHT MITT WITH DOWNLIGHT
2. 200 VENTILATED DOWNLIGHT MITT/BASIC MITT WITH DOWNLIGHT
3. 250 VENTILATED LOFT MITT WITH DOWNLIGHT
4. 200 VENTILATED DOWNLIGHT MITT/BASIC MITT WITHOUT DOWNLIGHT

Drawing 3

## APPENDIX 4

Certificate of Test	
No. 2060B	
"Copyright CSIRO 2014 ©" Copying or alteration of this report without written authorisation from CSIRO is forbidden.	
This is to certify that the element of construction described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:	
Efficiency Matrix Pty Ltd 14 Ondine Drive Wheelers Hill VICTORIA	
A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSV 1290B.	
Product Name:	SAMPLE 1 – Small Basic Mitt 150-mm protecting a 50-mm diameter downlight assembly.
Description:	Sample 1 comprised a Small Basic Mitt 150-mm protecting a standard "gimble type" recessed downlight assembly. The downlight assembly, 50-mm in diameter, was recessed into the plasterboard ceiling through a 70-mm diameter opening, and retained in place using spring metal clips. On the unexposed face of the ceiling, the downlight assembly was protected by a 150-mm Small Basic Mitt. The hood was made out of 10-mm thick intumescent based material, formed into a conical shape, measuring 150-mm in diameter at its base and 160-mm in height. The hood incorporated small oval openings, four of which were located at 85-mm from the base and two at 130-mm from the base. The Small Basic Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the exposed edge of the cut opening and the downlight metal fascia housing, as shown in drawing numbered 1, dated 16 October 2007, by Efficiency Matrix Pty Ltd.
The element of construction described above satisfied the following criteria for fire-resistance for the period stated.	
Structural Adequacy	- not applicable
Integrity	- no failure at 121 minutes
Insulation	- 105 minutes
and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/90. The FRL is applicable for exposure to fire from the same side as tested.	
This certificate is provided for general information only and does not comply with the regulatory requirements for evidence of compliance.	
Testing Officer:	Chris Wojcik
Date of Test:	16 October 2007
Issued on the 26 <sup>th</sup> day of March 2014 without alterations or additions. This Certificate supersedes issue dated 14 October 2010.	
	
Brett Roddy Team Leader, Fire Testing and Assessments	
	
CSIRO Materials Science and Engineering 14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555	
	
This document is issued in accordance with NATA's accreditation requirements	

Copy of Certificate of Test - No.2060B



This laboratory is accredited (Accreditation No.165, Corporate Site No. 3625) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

# Certificate of Test

No. 2061B

"Copyright CSIRO 2014 ©"  
Copying or alteration of this report  
without written authorisation from CSIRO is forbidden.

This is to certify that the element of construction described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Efficiency Matrix Pty Ltd  
14 Ondine Drive  
Whealers Hill VICTORIA

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSV 1290B.

Product Name: SAMPLE 2 – Basic Mitt 200-mm protecting a 65-mm diameter downlight assembly.

Description: Sample 2 comprised a Basic Mitt 200-mm protecting a standard "gimble type" recessed downlight assembly. The downlight assembly, 65-mm in diameter, was recessed into the plasterboard ceiling through a 90-mm diameter opening, and retained in place using spring metal clips. On the unexposed face of the ceiling, the downlight assembly was protected by a 200-mm Basic Mitt. The hood was made out of 10-mm thick intumescent based material, formed into a conical shape, measuring 200-mm in diameter at its base and 210-mm in height. The hood incorporated small oval openings, four of which were located at 120-mm from the base and two at 195-mm from the base. The Basic Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the exposed edge of the cut opening and the downlight metal fascia housing, as shown in drawing numbered 1, dated 16 October 2007, by Efficiency Matrix Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	111 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/90. The FRL is applicable for exposure to fire from the same side as tested.

This certificate is provided for general information only and does not comply with the regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 16 October 2007

Issued on the 26<sup>th</sup> day of March 2014 without alterations or additions. This Certificate supersedes issue dated 14 October 2010.



Brett Roddy  
Team Leader, Fire Testing and Assessments



CSIRO Materials Science and Engineering  
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA  
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555



This document is issued in accordance with NATA's accreditation requirements

Copy of Certificate of Test - No.2061B



This laboratory is accredited (Accreditation No.165, Corporate Site No. 3625) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.



# Certificate of Test

No. 2062B

"Copyright CSIRO 2014 ©"  
Copying or alteration of this report  
without written authorisation from CSIRO is forbidden.

This is to certify that the element of construction described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Efficiency Matrix Pty Ltd  
14 Ondine Drive  
Wheelers Hill VICTORIA

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSV 1290B.

Product Name: SAMPLE 3 – Large Ventilated Loft Mitt 250-mm protecting a 75-mm diameter downlight assembly.

Description: Sample 3 comprised a Large Ventilated Loft Mitt 250-mm protecting a standard "gimble type" recessed downlight assembly. The downlight assembly, 75-mm in diameter, was recessed into the plasterboard ceiling through a 105-mm diameter opening, and retained in place using spring metal clips. On the unexposed face of the ceiling, the downlight assembly was protected by a 250-mm Large Ventilated Loft Mitt. The hood was made out of 12-mm thick intumescent based material, formed into a conical shape, measuring 250-mm in diameter at its base and 270-mm in height. The hood incorporated small oval openings, four of which were located at 140-mm from the base and two at 235-mm from the base. The Large Ventilated Loft Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the exposed edge of the cut opening and the downlight metal fascia housing, as shown in drawing numbered 1, dated 16 October 2007, by Efficiency Matrix Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	63 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/60. The FRL is applicable for exposure to fire from the same side as tested.

This certificate is provided for general information only and does not comply with the regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 16 October 2007

Issued on the 26<sup>th</sup> day of March 2014 without alterations or additions. This Certificate supersedes issue dated 14 October 2010.

*B. Roddy*

Brett Roddy  
Team Leader, Fire Testing and Assessments



CSIRO Materials Science and Engineering  
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA  
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555



This document is issued in accordance with NATA's accreditation requirements

Copy of Certificate of Test - No.2062B



This laboratory is accredited (Accreditation No.165, Corporate Site No. 3625) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

# Certificate of Test

No. 2063B

"Copyright CSIRO 2014 @"  
Copying or alteration of this report  
without written authorisation from CSIRO is forbidden.

This is to certify that the element of construction described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Efficiency Matrix Pty Ltd  
14 Ondine Drive  
Whealers Hill VICTORIA

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSV 1290B.

Product Name: SAMPLE 4 – Basic Mitt 200-mm protecting a 90-mm diameter cut-out opening.

Description: Sample 4 comprised a Basic Mitt 200-mm Fire Hood protecting a clear 90-mm diameter opening in the plasterboard ceiling. On the unexposed face of the ceiling, the opening was protected by a 200-mm Basic Mitt. The hood was made out of 10-mm thick intumescent based material, formed into a conical shape, measuring 200-mm in diameter at its base and 210-mm in height. The hood incorporated small oval openings, four of which were located at 120-mm from the base and two at 195-mm from the base. The Basic Mitt was fixed into position using a metal wire clip, threaded through the top two holes and secured between the plasterboard sheets..

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	101 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/90. The FRL is applicable for exposure to fire from the same side as tested.

This certificate is provided for general information only and does not comply with the regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 16 October 2007

Issued on the 26<sup>th</sup> day of March 2014 without alterations or additions. This Certificate supersedes issue dated 14 October 2010.



Brett Roddy  
Team Leader, Fire Testing and Assessments



CSIRO Materials Science and Engineering  
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA  
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555



This document is issued in accordance with NATA's accreditation requirements

Copy of Certificate of Test - No.2063B



This laboratory is accredited (Accreditation No.165, Corporate Site No. 3625) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.