acrow.
ENGINEERING & CONSTRUCTION

# PRODUCT & INSTALLATION GUIDE
# UNI-MESH FR2

HARDWARE

Any safety provisions as directed by the appropriate governing agencies must be observed when using our products. The pictures in this document are snapshots of situations at different stages of assembly, and therefore are not complete images. For the purpose of safety, they should not be deemed as definitive.

The loads featured in this document, related to the parts of the product, are approximate.

The company reserves the right to introduce any modifications deemed necessary for the technical development of the product.

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## Product & Installation Guide Release Notes

This page is intended to record all changes to the **Uni-Mesh FR2** product & installation guide pages.

Changes or additions to this manual will be itemised with a brief description and date when the amendments were made.

| ISSUE | DATE | Amendment Description |
|---|---|---|
| A | 03/24 | First Release |
| B | 01/26 | Second Release |
| C | 02/26 | Third Release |
| D | 04/26 | Fourth Release |
| E | 06/26 | Blue Uni Mesh Note update |
| F | 10/26 | Fifth Release |

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# 1. Technical Specifications

## Product Description

**Uni-Mesh FR2** is a steel wire-reinforced containment mesh that serves as a control measure against falling objects within a scaffold bay and other elevated working platforms.

Uni-Mesh FR2 features a durable 50x50mm grid comprising of a 9mm strip that has impregnated wire strands. These strips are sandwiched together with a shade cloth material between them.

## Purpose of the Document

The purpose of this document is to provide guidelines for safe handling, transport and installation of **Uni-Mesh FR2**.

The document also outlines the various components of the system and it features illustrations, working load limits, typical assembly arrangements and safe transport and handling measures.

The information contained in this document is provided as a general guide only and does not replace the need for the design to be reviewed and checked by a qualified person in the field of temporary works design and installation, concrete, steel, building construction and services.

This material has been prepared in the context of relevant Australian Standards and the National Construction Code (NCC). Users should make themselves aware of any recent changes to these documents referred to therein and to local variations or requirements.

This document is NOT a substitute for site-specific Safe Operation Procedures. It is the Installation Contractors responsibility to prepare safe work method statements and observe and comply with site specific health and safety regulations, standards and policies.

Acrow Formwork and Scaffolding has dedicated engineering services available for project assistance. We can provide design support for clients to determine the best way to specify and document these systems. Our technical experts can identify the most efficient temporary work design meeting project requirements, specifications and installation process.

Should the users require any further information or guidance, they are encouraged to contact their local Acrow branch.

## Safety Information

This safety information is to draw the user's attention to possible musculoskeletal disorders as a result of manual handling during assembly and dismantling of the **Uni-Mesh FR2** system

It is recommended that users of the **Uni-Mesh FR2** system employ and implement appropriate procedures and control measures to eliminate or control any risk of Musculoskeletal disorder/injury while handling.

Refer to the Code of Practice on manual handling published by local Workcover Authority or other approved and recognized guidelines for correct and appropriate manual handling procedures.

# 1. Technical Specifications

## Important Information

The erection and application instructions contained in this manual are the recommended methods to be used for **Uni-Mesh FR2** products.

The technical related instructions must be accurately followed to obtain the correct performance of the product. Any deviation from the recommended usage will require a separate design and/or verification by Acrow Engineering.

The illustrations in these assembly configurations are a minimum guideline only.

The combined use of the **Uni-Mesh FR2** system with containment & fixing equipment from other suppliers may entail performance issues and therefore requires a design check and/or verification by Acrow Engineering or a qualified experienced engineer.

Hazard Identification/Risk Assessments for the erection and dismantling of the system are available from Acrow branches. Site specific Hazard and Risk assessments may need to be generated for specific projects.

## Disclaimer

The guidelines provided in this document are limited to the relevant codes nominated below. It does not include certification of any structures or works associated with a project.

## Applicable Codes and Standards

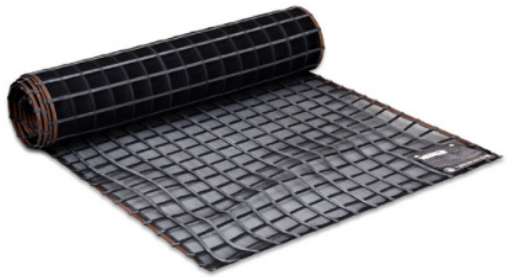
Uni-Mesh FR2 is tested in compliance with:

- QLD Work Health and Safety Regulation (WHSR) 2011, Regulation 315D
- AS2001.2.4 (Methods of test for textiles - Physical tests - Determination of bursting pressure of textile fabrics - Hydraulic diaphragm method).
- AS1530.2 Methods for Fire Test on Building Materials, Components and Strucutre. Part 2: Test for Flammability of Materials
- AS 1576.7 (Interim) 2021 Scaffolding, Part 7: Safe use of encapsulation on scaffolding
- AS 4576:2020, Guidelines for scaffolding

# 2. GENERAL PRODUCT INFOMATION

## 2. General Product Information

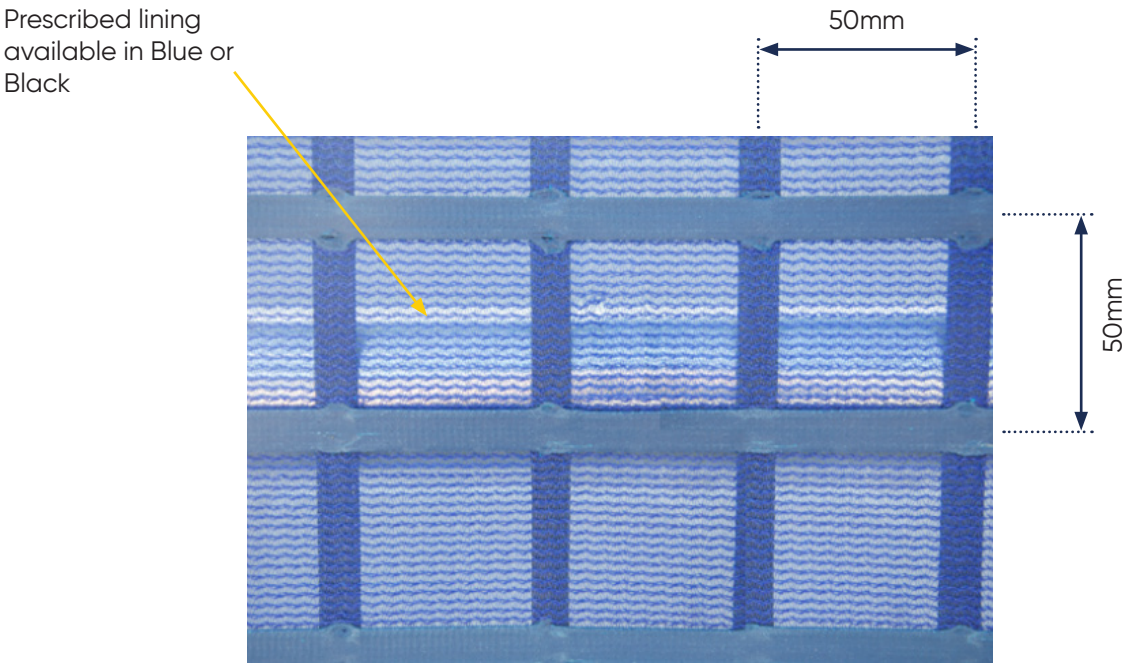
### Uni-Mesh FR2

| PRODUCT | DESCRIPTION | PRODUCT CODE | MASS (KG) (NOM.) |
|---|---|---|---|
|  | **Uni-Mesh FR2**<br>A steel wire-reinforced scaffold mesh serves as a control measure against falling objects. It features a durable 50mmx50mm grid comprising of a 9mm strip that has impregnated wire strands, these strips are then sandwiched together with a prescribed lining material between them. Uni-Mesh FR2 is designed for easy installation and re-use in mind. | | |
| | Black 0.3 x 10m Roll | UMFR203BK | 2.50 |
| | Black 0.95 x 10m Roll | UMFR295BK | 7.95 |
| | Black 1.9 x10m Roll | UMFR219BK | 15.9 |
| | Blue 0.95 x 10m Roll | UMFR295BU | 7.95 |
| | Blue 1.9 x 10m Roll | UMFR219BU | 15.9 |
| | *Special Order Only* | | |
| | **Heavy Duty Zip-Tie (110kg Tensile Strength)**<br>Heavy-duty cable ties as a means of securing the Uni-Mesh FR2 on to scaffold structures. Rated for a tensile strength of 110kg, the 12mm zip-tie features a sharper end designed to easily pierce the mesh containment. The 110kg Zip-tie comes in a pack of 500 pieces. | | |
| | 12mm Zip-Tie with Tensile Strength 110kg | ZTHD | 0.5 |
| | **Zip-Tie 370x7.6mm (50kg Tensile Strength)**<br>• UV Resistant<br>• Pack of 100 | | |
| | Zip-Tie 370x7.6mm | ZTCF116 | 0.5 |
| | **KwikAz Fixtures**<br>Offers faster installed connections between Uni-Mesh and typical scaffold tube | | |
| | KwikAz Clips | CF022 | 0.2 |
| | KwikAz Tool | CF022A | 0.2 |

# 3. SYSTEM DETAILS

## 3. System Details

### Uni-Mesh FR2 Details




### Uni-Mesh FR2 Porosity

For the purposes of design, assessment, and wind load calculations, the Uni-Mesh FR2 shall be treated as having 0% porosity.

### Uni-Mesh FR2 Fixings

For the installation of the Uni-Mesh FR2, the number of required zip-ties and their fixing locations shall be in accordance with this Technical Guide. It is essential for the robustness of the system to utilise the specified 110kg-rated 12mm zip-ties (ZTHD) as the standard fixing. The installation of generic cables ties and kwikaz clips is at the discretion of the installer, though, it must be understood this does not comply with the strength requirements of AS1576.7 Interim Standard

### UV Exposure

Uni-Mesh FR2 has been tested for 2000 hours of UV exposure in accordance with ASTM G154 (Cycle 2) with no colour degradation, chipping, cracking, or deterioration of the mesh observed.

# 4. INSTALLATION DETAILS

# 4. Installation Details

## Installation Process

The purpose of this section is to provide guidelines for installation and removal of the Uni-Mesh FR2. This should be used as a guide only, it is the contractors responsibility to prepare safe work method statements and observe and comply with site specific health and safety regulations, standards and policies.

Acrow has dedicated engineering services available for project assistance. We can provide design support for clients to determine the best way to use Uni-Mesh FR2. Our technical experts can identify the most efficient temporary work design meeting project requirements, specifications and installation process.

Should the users require any further information or guidance, they are encouraged to contact their local Acrow branch.

## Guidelines for installing Uni-Mesh FR2

Uni-Mesh FR2 must be installed by a qualified and competent person, the fixing (Installation) of Uni-Mesh FR2 is govern by Australian Standard AS 4576:2020, Guidelines for Scaffolding.

The following method of installation adheres to the strength requirements of AS1576.7

Clause 7.10.4 provides guidelines for fixing encapsulation to a scaffold and are as follows:

- On tube-and-coupler scaffolds, ensure that transoms and putlogs do not project more than 150 mm over the outside ledger. Cap or pack around ends of tubes in contact with encapsulation.
- Use fully decked platforms with guardrails while erecting encapsulation.
- Encapsulation should be fixed to the inside of the scaffold at each level, unless otherwise specified in the design.
- Encapsulation should be effectively continuous by using sufficient overlap.
- Tightly tie butt joints if overlap is not possible.
- Ensure that encapsulation is sufficiently taut and fixed tight against the scaffolding to prevent chafing.
- Where encapsulation has inbuilt fixing points, ensure that the layout and position of these points is compatible with the scaffolding framework.
- Ensure that encapsulation is in direct contact and tied back to the open edges of the platform and guardrails.
- Ensure that there are as few gaps as possible between encapsulation and the platform edge.

## 4. Installation Details

### Prior to Installation of Uni-Mesh FR2

Prior to commencing the installation of Uni-Mesh FR2, ensure that the fully decked platform is braced and stable or tied into the concrete slab or adjacent structure, following the project-specific construction drawings.

Free-standing scaffolds have the potential to overturn or twist, regardless of their height. Therefore, it is essential that scaffold towers be tied to a solid foundation, adjacent building, or suitable structure to prevent inward or outward movement of the scaffold. This ensures stability and enables the effective performance of the scaffold structure as it grows in height and length. Installing Uni-Mesh FR2 on a free-standing structure increases the risk of overturn or twist due to the additional wind load imposed on the scaffold structure and scaffold must be designed accordingly.

Face bracing of the scaffold structure

Raker bracing of the scaffold structure or ties to the building as specified by the engineer in the scaffold project specific documentation

## 4. Installation Details

### Tying Uni-Mesh FR2 onto the Scaffold Structure

- Tie the Uni-Mesh FR2 on the scaffold structure (ledgers) using heavy-duty cable ties (Zip Ties) with a tensile strength of at least 110kg (ZTHD). Ensure that the cable ties are suitable for outdoor use and are UV resistant.
- Tying should be performed progressively while rolling out the Uni-Mesh FR2 roll.
- Insert the cable tie from inside the scaffold, through the Uni-Mesh FR2 and underneath the ledger. Then roll it over the ledger and insert it again through the Uni-Mesh FR2 and above the ledger.
- During the process, ensure the cable tie secure the horizontal reinforced 9mm strip of the Uni-Mesh FR2.
- Tie the cable tie and cut off the excess tail (ensure these is no sharp edge exposed).

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

## 4. Installation Details

### Installing the Uni-Mesh FR2

### Step 1 - Position the roll upright

- Ensure that the deck is clear and stand the roll of Uni-Mesh FR2 upright with the free edge closest to the standard.

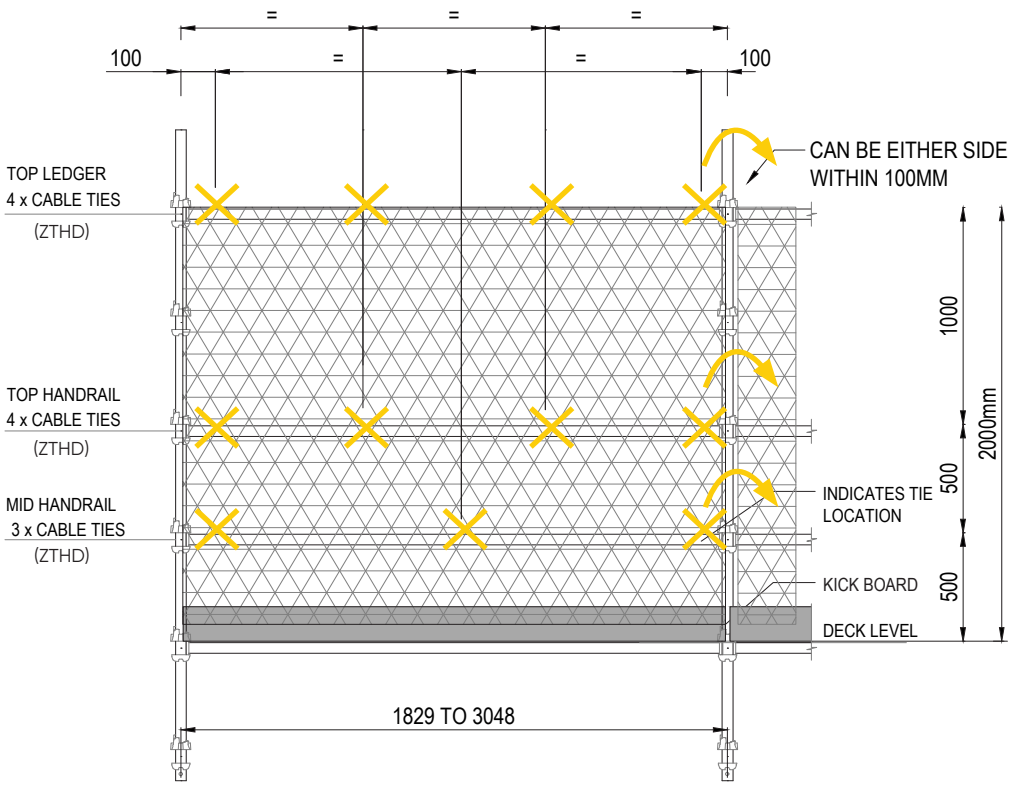
### Step 2 - Attach the Uni-Mesh FR2 to at least 3 points when starting

- For the start of the roll, fix the Uni-Mesh FR2 to ledgers in 3 locations (Top ledger, handrail and mid handrail) within 50mm of the standard.
- Heavy-duty ties (THD) located at 1a, 1b and 1c.

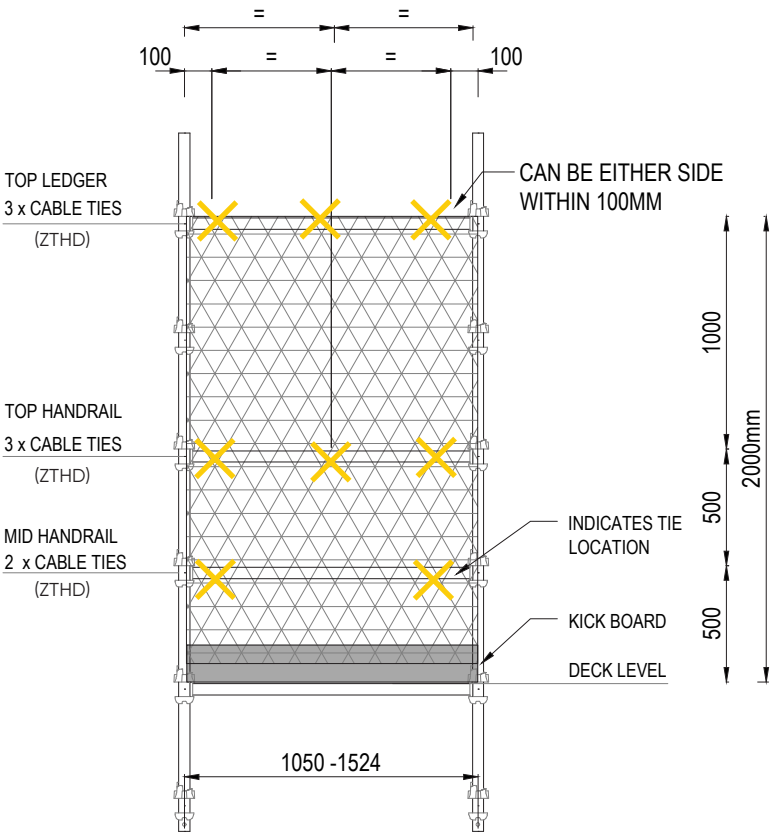
## 4. Installation Details

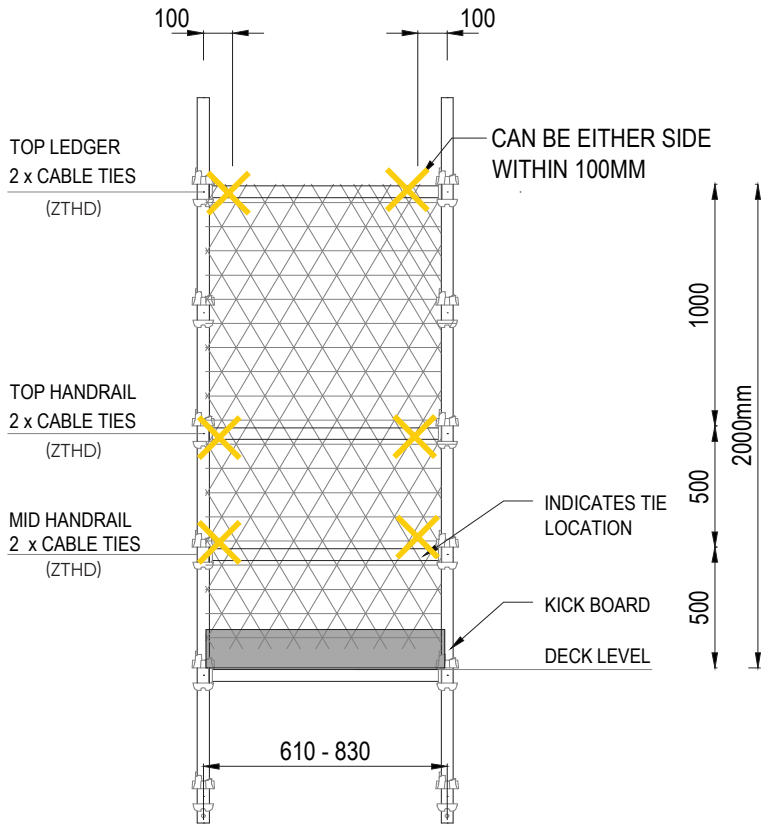
### Step 3 - Roll out of the Uni-Mesh FR2

- Once the three points of contact are fixed, begin to roll out the Uni-Mesh FR2 and start tying it to the ledger following the sequences below.
- Always start by fixing the Uni-Mesh FR2 into the top ledger first, then proceed downwards (handrail and mid handrail).



## 4. Installation Details

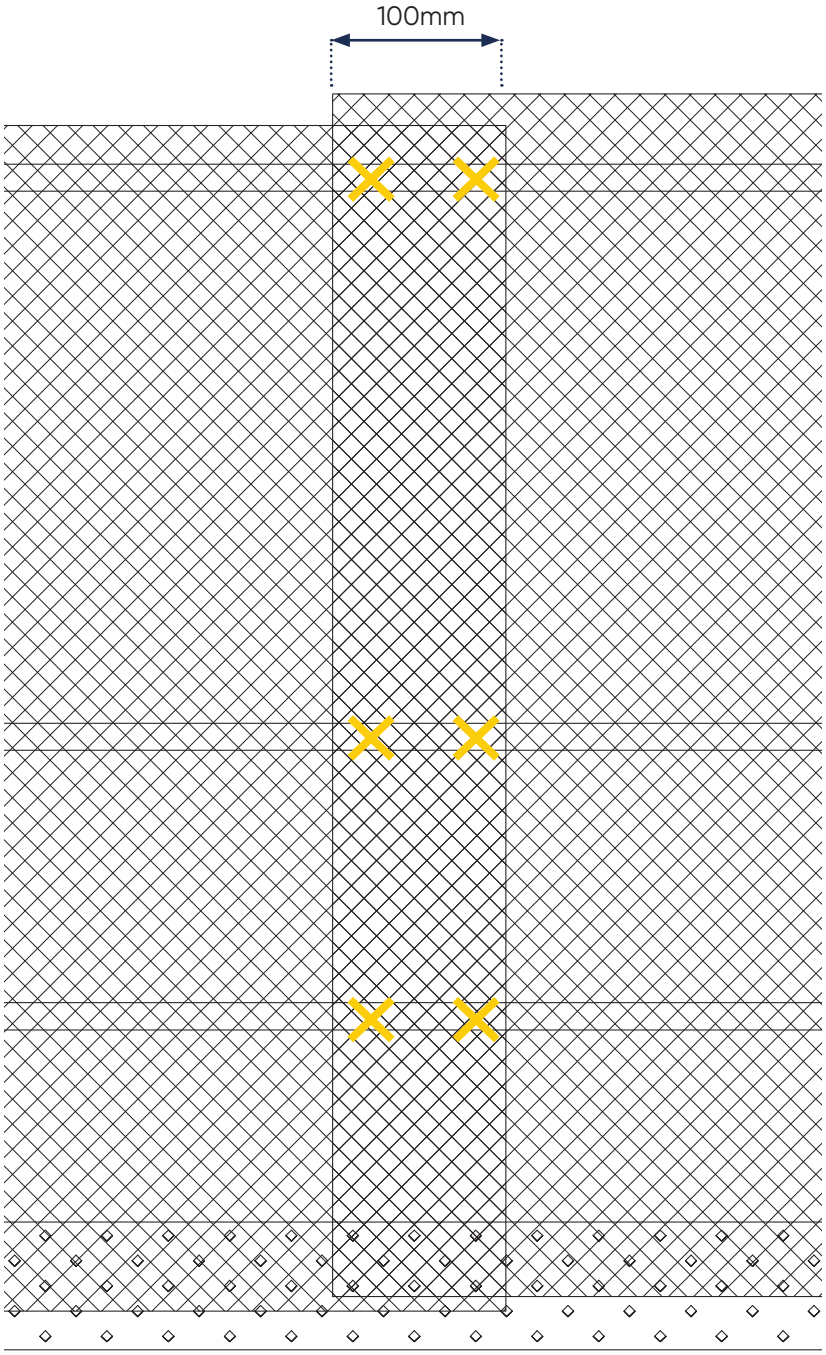


## 4. Installation Details

### Overlapping Mesh

- When starting a new roll of mesh halfway through a bay, you will need to overlap the end of one roll of mesh with the start of another.
- Both rolls of mesh must overlap a minimum of 100mm and must be fixed with 2 heavy-duty zip ties (ZTHD) at each ledger.
- These zip ties must penetrate both ends of the mesh as seen in the image below.



## 4. Installation Details

### Step 4 - Proceed to next Scaffold Bay

- Continue rolling out the Uni-Mesh FR2 into scaffold mid bays and follow steps 1 - 3 again to complete the full roll.

### Step 5 - Wrap Uni Mesh FR2 into the End Bay

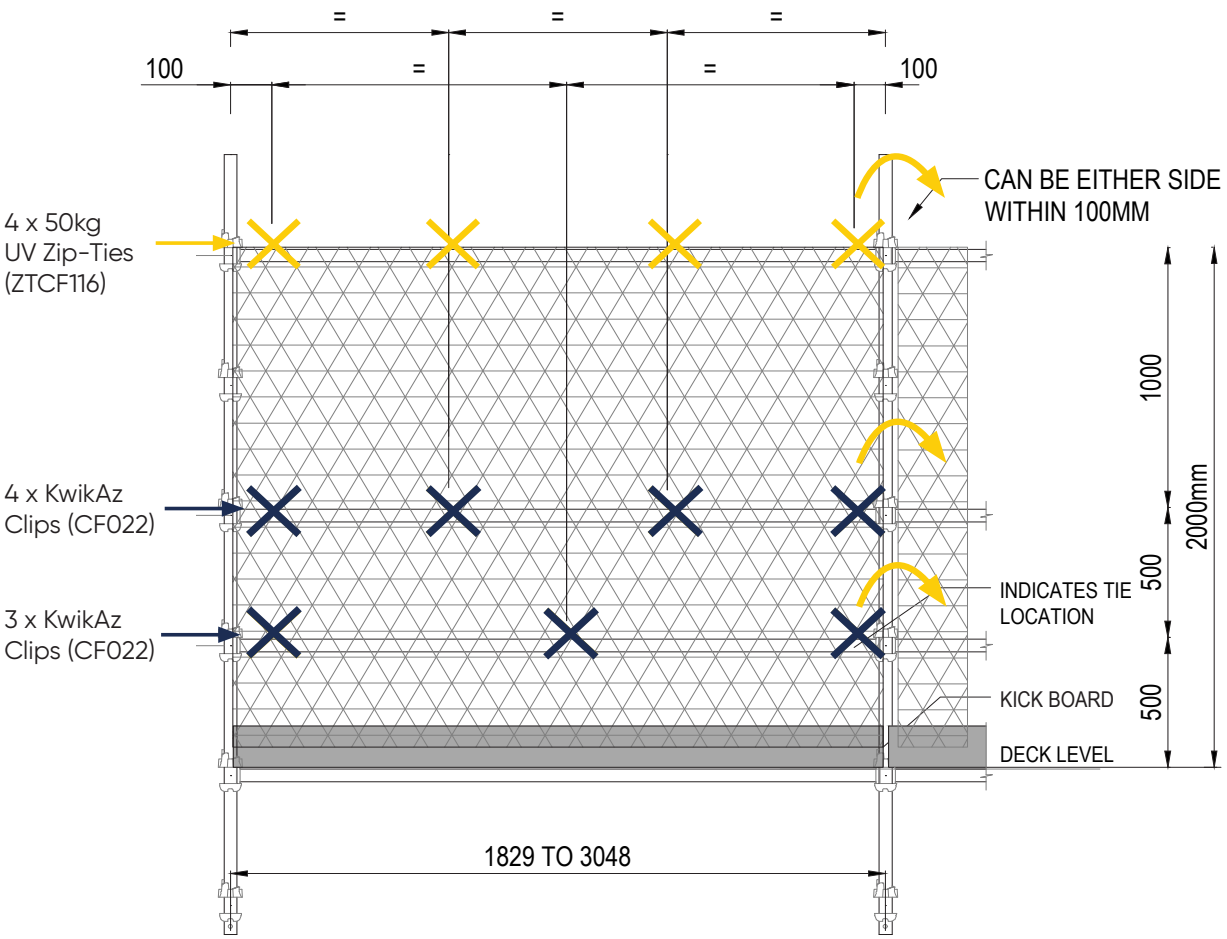
- Fix the Uni-Mesh FR2 into the top transom and handrails using heavy-duty cable ties (ZTHD) as per below sequence.
- If excess material remains, cut down to suit required length.
- Utilising heavy-duty cable ties ensures compliance with strength requirement of AS1576.7

## 4. Installation Details

### Tying Uni-Mesh FR2 onto the Scaffold Structure

50kg UV Zip Ties (ZTCF116) and Kwikaz clips can continue to be used to fasten Uni-Mesh FR2 to ledgers following the prior installation sequence.

Note: This will not ensure compliance with strength requirements of AS1576.7 Interim Standard.



## 4. Installation Details

### Un-Installing and Rolling Up Uni-Mesh FR2

### Step 1 - Remove ALL fixtures (cable ties) except the ones on the top rail

- Ensure the correct tools are used to remove the fixtures to limit damage to the mesh within the product.
- Uni-Mesh FR2 must NOT be pulled off the structure whilst cable ties are in place, as this will damage the product.

### Step 2 - Start removing top ties and roll up the Uni-Mesh FR2

- Once all but the top ties are removed, you can begin to roll up the product.
- Cut only one top cable tie at a time.

## 4. Installation Details

### Step 3 - Roll the Uni-Mesh FR2 up to the next top tie

- Remove next cable tie to continue rolling up the Uni-Mesh FR2, this will ensure the roll is tight and easily transported.
- Once last tie from the side of the bay has been removed you may start rolling it to the next cable tie along the bay. Once tie has been removed, roll the Uni-Mesh FR2 up to the next available cable tie (4).

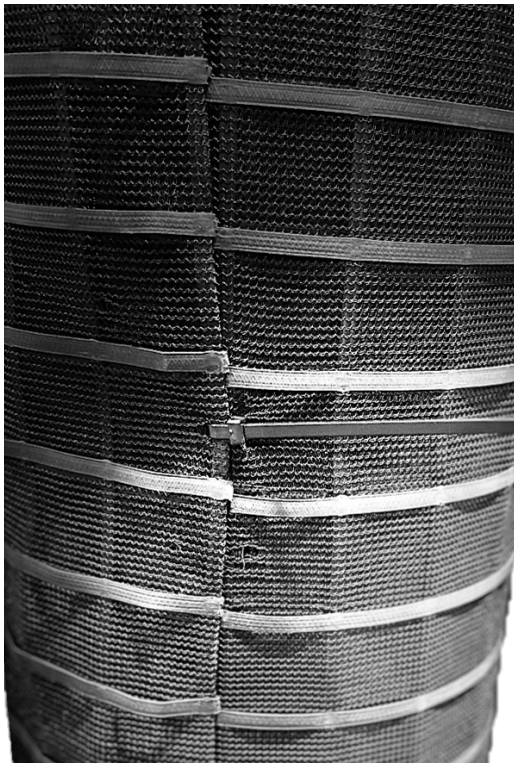
### Step 4 - Use foot while rolling the Uni -Mesh FR2

- It is recommended to use your foot to brace the bottom of the Uni-Mesh FR2 to ensure conformity of the roll. When reaching the next tie, it can now be removed. Continue this process untill you reach the end of the roll.

## 4. Installation Details

### Step 5 - Secure the Roll

- Once the last tie has been removed, you can secure the roll by using cable ties or tie-wire.



# 5. TRANSPORT & HANDLING

## 5. Transport & Handling

### How to Move Uni-Mesh FR2

Uni-Mesh FR2 is light enough to be carried by one person.
To prevent damaging the Uni-Mesh FR2;

- Under no circumstances should the product be dropped from height.
- Uni-Mesh FR2 must not be dragged along the ground to prevent the shade cloth from tearing.

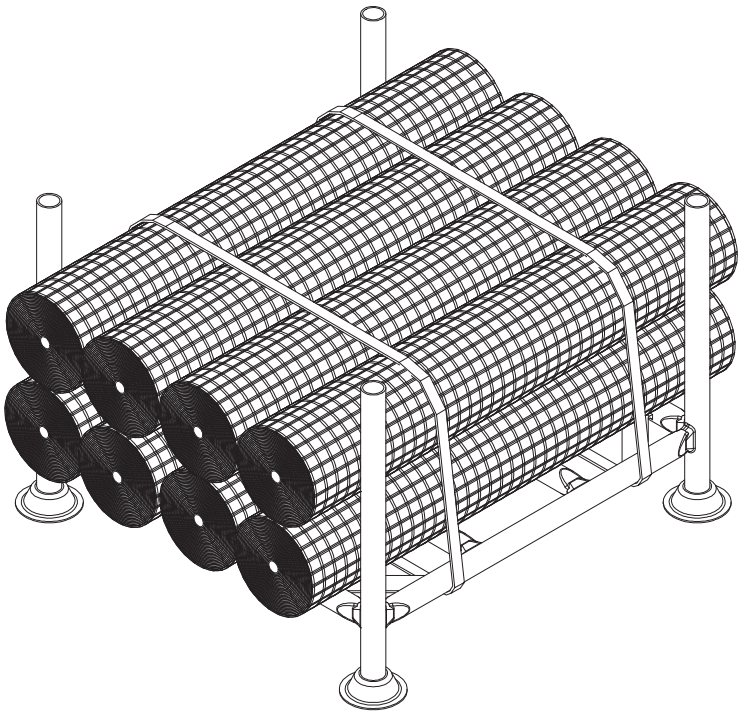
### How to Store Uni-Mesh FR2

It is recommended that Uni-Mesh FR2 is rolled up and stored in pallets/stillages and kept out of the sun to prevent UV damage to the plastic.

It is a natural characteristic of plastic to degrade and fade when exposed to the sun for an extended period of time. In order to enhance the lifespan of the product, undercover storage is recommended when Uni-Mesh FR2 is not in use.

The Acrow stillage is used to store a set number of items per a stillage. Items should be stored in a particular way to prevent them from falling off the stillage. When a stillage is not used, ensure items are bundled and placed on suitable dunnage. The recommended method and process is:

- Stack items next to and on top to each other.
- Only pack and stack similar matching lengths per stillage.
- Ensure every stillage load does not exceed height of stillage per the advised image below.
- Secure assembled items onto stillage by using at least two straps or plastic wrapped for enclosed stillages (two straps for enclosed stillage not applicable).
- Refer to Acrow Scaffold Stillage Transport and Manual Handling Document for further stacking and transport recommendations.



# 6. INSPECTION

# 6. Inspection

## Inspection Checklist

The following checklist will assist in the successful installation and effectiveness of the Uni-Mesh FR2 scaffold containment.

Parts of the checklist have been extracted from the Australian Standard AS 4576:2020, Guidelines for Scaffolding, Appendix E

| REQUIREMENTS | Y/N | COMMENTS | EXPLANATORY NOTES |
|---|---|---|---|
| **DESIGN DOCUMENTATION** | | | |
| Installers have the project specific scaffold structural design documentations and all scaffold is installed, braced and tied as per the drawings. Ensure drawings specifiy continament is installed. | | | Scaffolds fitted with encapsulation have increased dead loads and are exposed to increased wind and rain loads. The design of such scaffolds and ties should be checked by a competent person such as an engineer experienced in scaffold design.<br><br>An example, wind load in certain construction zone may impose the need for an additional ties and bracings to ensure stability of the scaffold structure. |
| Installer has a copy of Acrow's typical tie fixing of the Uni-Mesh FR2 | | | The robust strength of Uni-Mesh FR2 and suitability for structural scaffold encapsulation applications depends on accurate installation and fixing of Uni-Mesh FR2 into the scaffolds components. |
| **DURING INSTALLATION** | | | |
| Is correct cable tie (Code: ZTHD) being used for fixing to comply with strength requirements of AS1576.7?<br><br>*(Cable tie with a tensile strength of at least 110kg)* | | | The robust strength of Uni-Mesh FR2 and its suitability for structural scaffold encapsulation applications are conditional on using a cable tie with a tensile strength of at least 110kg (ZTHD). |
| Are the fixing ties secure? | | | Insecure fixings may enable part of the encapsulation to break free resulting in a flapping effect on the scaffold that may overload the ties to the permanent structure. |
| Are there any rips or tears? | | | Rips or tears will enable materials to escape from the scaffold. If overlap joints are not tightly closed objects may escape from the working platform. |
| Are the overlap joints satisfactory? | | | If overlap joints are not tightly closed objects may escape from the working platform. |

# 7. APPENDICES

## 7. Appendices

**Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

INFRASTRUCTURE TECHNOLOGIES
www.csiro.au

# Flammability Tests On UNI-MESH™ FR2 Fire retardant Scaffolding Encapsulation in Accordance with AS1576.7 (Int):2021

Fire Testing Report

**Author:** Joe Abraham
**Report Number:** FE3173-RPT-01
**Quote Number:** FE3173

**Date:** 21 November 2023
**Version:** Revision B final

**Client:** Acrow Formwork and Scaffolding Pty

**Commercial-in-confidence**

# 7. Appendices

## **Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

### Enquiries

Enquiries should be addressed to:

Team Leader, Fire Engineering

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Victoria-3169, Australia
Telephone +61 3 9545 2587

Author

Infrastructure Technologies
Private Bag 10, Clayton South
Victoria-3169, Australia
Telephone +61 3 9545 2587

Client

Acrow Formwork and Scaffolding Pty
280 Bilsen Rd, Geebung QLD 4034

### Test Report Details

Document: Fire Testing Report

Test Standard: AS1576.7 (Int):2021 & BS 7955:1999

Client: Acrow Formwork and Scaffolding Pty

Quote Number: FE3173

### Test Report Status and Revision History

| VERSION | STATUS | DATE | DISTRIBUTION | COMMENT | FORMAT |
|---|---|---|---|---|---|
| Revision A | Draft for internal review | 03 November 2023 | CSIRO | CSIRO | Word |
| Revision B | Final for issue | 21 November 2023 | CSIRO; | CSIRO | Pdf |

### Test Report Authorisation

| AUTHOR | REVIEWED BY | AUTHORISED BY |
|---|---|---|
| Joe Abraham | Alex Webb | Alex Webb |
| | | |
| 21 November 2023 | 21 November 2023 | 21 November 2023 |

### Use of this Report

***Use of Reports – Testing***

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## 7. Appendices

**Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

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# 7. Appendices

## **Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

# 1 Summary

CSIRO has been engaged by Acrow Formwork and Scaffolding Pty to conduct Mid-scale Fire tests in accordance with Appendix A of AS1576.7 (Int):2021 on the UNI-MESH FR2™ Fire retardant scaffolding encapsulation.

Sponsored Investigation Report Number: FE3173-RPT-01

Title of Report: Flammability Tests On UNI-MESH™ FR2 Fire retardant Scaffolding Encapsulation in Accordance with AS1576.7 (Int):2021

CSIRO was not responsible for sampling of test specimens. All test specimens were sampled and supplied by Acrow Formwork and Scaffolding Pty.

The results of these fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions.

# 2 Test Details

## 2.1 Sample Identification

See Table 1.

## 2.2 Sponsor

Acrow Formwork and Scaffolding Pty
280 Bilsen Rd,
Geebung QLD 4034

## 2.3 Manufacturer

See Table 1.

## 2.4 Job Number

FE3173

## 2.5 Test Date & Operator

All the tests were conducted on 23rd October 2023 by Joe Abraham and Alex Webb of CSIRO at CSIRO Infrastructure Technologies Lab, Gate 6, Normanby Rd, Notting Hill VIC 3168.

## 2.6 Description of Sample

The material description provided in the table below was provided by Acrow Formwork and Scaffolding Pty.



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# 7. Appendices

## **Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

**Table 1 Material Description**

| CSIRO specimen ID | Description | Colour | Dimension of the roll |
|---|---|---|---|
| FE3173-1 | **Product Name:** UNI-MESH FR2<br>**Encapsulation Type:** Flexible<br>**Manufacturer Details:** IMAXIA COPORATION<br>**Manufacturer Address:** NO. 68-16 NORTH SHIJIUHU ROAD, GAOCHUN ECONOMIC DEVELOPMENT ZONE, NAHJING CHINA<br>**Description:** The strip of this product is made of color masterbatch, flame retardant raw material, LDPE steel wire and high temperature fusion, the fusion temperature is about 200 degrees Celsius. Strip width is about 9.3mm and 1.45mm thickness.<br>**Batch Number:** 5<br>**Distributor Name**: Acrow Formwork and Scaffolding Pty<br>**Date of Manufacture:** August 2023 | Black | 1.9m x 10m |

**Fixing Method:** The specimen was secured by heavy duty zip ties securing corners and mid-point (CSIRO supplied and installed).

# 3 Method

## 3.1 Conditioning of Specimens

The specimens were conditioned to constant mass at a temperature of 23 ± 2°C for a period of 7 days prior to testing.

## 3.2 Test Method

Tests were performed in accordance with the requirements set out for Mid-scale fire tests specified in Appendix A of AS1576.7 (Int):2021[1] Containment nets and sheets on construction works – Specification for performance and test methods. All test specimens were exposed in the horizontal orientation with the standard pilot operating.

All tests were conducted under a smoke collection hood connected to an exhaust fan and pollution scrubbing. The flow rate is set to ensure the ignition source flame is not disturbed by the induced air movement.

Samples were cut to a length of 2.0m from the roll supplied. Where one dimension of the product is less than 2.0m, an additional material was added to the top or one side to make the sample 2.0m x 2.0m.

The fuel was ignited, and a timer was started. The behaviour of the material was observed throughout the tests and for at least 1 min after the heptane stopped burning.

Three replicates of the test were conducted as required by the standard.

A labelling assessment in accordance with Clause 3.2 of AS1576.7:2021 was also conducted.

## 3.3 Test Method variations

For compliance with Mid-scale fire tests specified in Appendix A of AS 1576.7:2021, sheet material shall be mounted vertically with the centre of the bottom edge positioned so that top of the fuel tray is in contact



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# 7. Appendices

## **Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

with the underside of the material. However, the customer specified to test the material with a 150mm gap between the underside of the mesh and the top of the fuel tray as stated in Clause C3.1.3.1 of BS7955:1999[2].

### 3.4 Test acceptance criteria

The requirements of the mid-scale flammability test are:

a) Flaming on the test sample shall cease not greater than 10s after the heptane stops burning

b) There shall be no flaming droplets or flaming debris 10 s after heptane stops burning

c) No flaming shall reach any edge of the specimen during application of the ignition source

# 4 Results

### 4.1 Results of the Flammability Test

The results of tests summarised in the tables below. Photos of the test are given in the table below.

**Table 2 FE3173-1 Results of Flammability Tests**

| Criteria | Acceptance Criteria (s) | Test 1 result | Test 2 result | Test 3 result | Compliance |
|---|---|---|---|---|---|
| **Duration of flaming on specimen after heptane flameout** (s) | 10 | 0 | 0 | 0 | **Complies** |
| **Duration of flaming droplets or debris after heptane flameout** (s) | 10 | 0 | 0 | 0 | **Complies** |
| **Flaming reached any edge of the specimen** | No | No | No | No | **Complies** |



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# 7. Appendices

**Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

## 4.2 Test Photos

Figure 1 FE3173-1 specimen at ignition of heptane tray. t=0s.

Figure 2 FE3173-1 specimen at t = 1 min 37s showing maximum flame height



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**Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

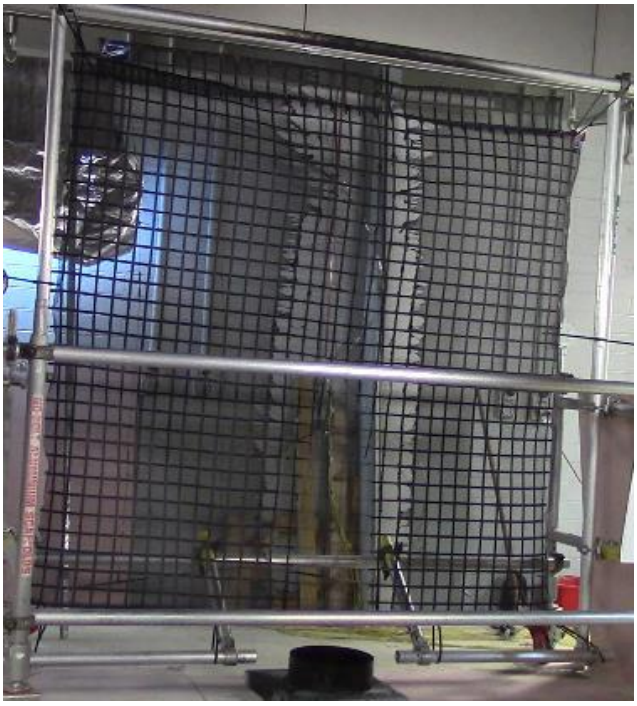

**Figure 3 FE3173-1 specimen at t = 6min, 37s. Heptane fuel tray burn out. No flames on the specimen observed.**



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**Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

## 5 Labelling Assessment

The labels attached to the end roll of the encapsulation was assessed against Clause 3.2 of AS1576.7:2021. The results are presented below.

**Table 3 FE3173-1 Label Assessment**

| Criteria | Visible on the label | Compliance |
|---|---|---|
| Manufacturer's name or trademark | Acrow | **Complies** |
| Product Identification | UNI-MESH | **Complies** |
| Batch Number or Date of Manufacture | Batch No.5, DOM – August 2023 | **Complies** |

**Figure 4 FE3173-1 Image also shows labelling on the product tested.**

## 6 Conclusion

- "UNI-MESH™ FR2" has been tested in accordance with the "Mid-scale Fire Test" as specified in Appendix A of the AS1576.7 (Int):2021. The test was conducted with the 150mm gap between the bottom of the mesh and the top of the fuel tray as a *variation* to the AS1576.7.
- "UNI-MESH™ FR2" complies with the acceptance criteria for the Mid-scale Flammable Test as specified in AS1576.7 (Int):2021 Appendix C.
- An assessment of the label attached to the end of the roll was conducted and was found comply with the criteria specified in Clause 3.2 of AS1576.7 (Int):2021.



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## 7. Appendices

**Appendix A** - Acrow Scaffolding Encapsulation Flammability Tests on UNI-MESH FR2 Test Report v2, CSIRO

# 7 References

1. Australia S. (2021) AS1576.7 (Int):2021 - Safe use of encapsulation on scaffolding. Standards Australia; 2021.
2. British Standard B. (1999) BS7955:1999 - Containment nets and sheets on construction works - Specification for performance and test methods. British Standard, BS; 1999.



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## **Appendix B** - Uni-Mesh FR2 Small Scale Fire Test, Compliance with AS1576.7

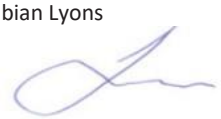
**AlfaTest Pty Ltd**
A.B.N. 58 096 333 774
PO Box 229, Salisbury QLD 4107
Unit 3/121 Evans Rd, Salisbury, Qld 4107

**Phone:** (07) 3715 3400
**Fax:** (07) 3715 3401
**Email:** info@alfatest.com.au

AlfaTest
"Delivering Results"

### FLAMMABILTY TESTING REPORT

| | |
|---|---|
| AlfaTest Report No: | 20231664M01 Re-issue |
| Date of Test: | 10 November 2023 |
| Client Name: | Acrow Formwork & Scaffolding Pty Ltd |
| Client Address: | 280 Bilsen Rd, Geebung, QLD 4034 |
| Client Order No: | 320 UNIMESH 191023 |
| Client Job No: | Not specified |
| Project Details: | Flammability Testing (Small Scale Fire Test) of supplied UNI-MESH FR2 |
| Sample Details as supplied: | Qty 1, Black Uni-mesh/Fire Retardant Flexible Encapsulation Code 7836 Batch No.5 DOM August 2023 |
| Test Specification: | AS 1576.7: 2021 Appendix A, Sec A.2 (a) in accordance with AS 1530.2 |
| Acceptance Specification: | AS 1576.7: 2021 Appendix A, Sec A.6.1 in accordance with AS 1530.2 |
| Compliance: | The results of the testing undertaken on the supplied components comply with the requirements of AS 1576.7 Appendix A, Section A.6.1 |
| Comments: | **This report is to be read in conjunction with AWTA Product Testing, Test No. 23-004358** |
| Revision No. | 1 |
| Revision Date: | 11/16/2023 |
| Revision Details: | Product Details amended on page 1. |

| | | | |
|---|---|---|---|
| Reviewed by: | Ellie Rahbar | Approved by: | Fabian Lyons |
| | | Signature: |  |
| | | Re-issue Date: | 16/11/2023 |

# 7. Appendices

## **Appendix C** - Uni-Mesh FR2 Material Flammability Index Certificate

AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd - trading as AWTA Product Testing
A.B.N 43 006 014 106

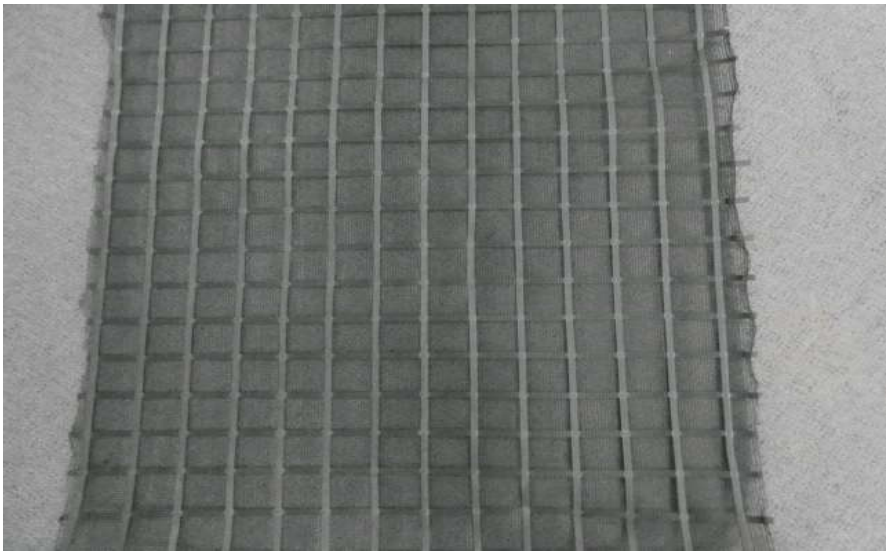
**1st Floor, 191 Racecourse Road, Flemington, Victoria 3031**
**P.O Box 240, North Melbourne, Victoria 3051**
**Phone (03) 9371 2400**

### TEST REPORT

**Client :** AlfaTest
PO Box 229
Salisbury QLD 4107

**Test Number :** 23-004358
**Issue Date :** 10/11/2023
**Print Date :** 13/11/2023
**Order Number :** 5139

**Sample Description**
Clients Ref : "Uni-Mesh Fire Retardant Flexible Encapsulation Code 7836A Batch No 5. DOM August 2023"
Reinforced Knitted Mesh
Colour : Black



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Fiona McDonald
APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc.(Hons)
MANAGING DIRECTOR

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## **Appendix C** - Uni-Mesh FR2 Material Flammability Index Certificate

AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd - trading as AWTA Product Testing
A.B.N 43 006 014 106

**1st Floor, 191 Racecourse Road, Flemington, Victoria 3031**
**P.O Box 240, North Melbourne, Victoria 3051**
**Phone (03) 9371 2400**

## TEST REPORT

**Client :** AlfaTest
PO Box 229
Salisbury QLD 4107

**Test Number :** 23-004358
**Issue Date :** 10/11/2023
**Print Date :** 13/11/2023
**Order Number :** 5139

**AS 1530.2-1993** **Methods for Fire Tests on Building Materials, Components and Structures.**
**Part 2: Test for Flammability of Materials**

| | | | |
|---|---|---|---|
| Date Tested | | 10-11-2023 | |
| Flammability Index | | 1 | |
| | Length | Width | |
| Spread Factor | 0 | 0 | |
| Heat Factor | 1 | 1 | |
| Maximum height (d) | | | |
| Mean | 2.4 | 2.0 | |
| Coefficient of Variation | 46.5 | 30.6 | % |
| Heat (a) | | | |
| Mean | 1.6 | 1.7 | °C.min |
| Coefficient of Variation | 15.0 | 28.5 | % |
| Number of Specimens Tested | 9 | 9 | |
| Observation | Visisble smoke,melting | | |

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.

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# 7. Appendices

## Appendix D - Uni-Mesh FR2 Strength Test LT-HW-0001

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**Phone:** (07) 3715 3400
**Fax:** (07) 3715 3401
**Email:** info@alfatest.com.au

AlfaTest
"Delivering Results"

### MECHANICAL TESTING REPORT

| | |
|---|---|
| AlfaTest Report No: | 20240171M01 |
| Date of Test: | 19 March 2024 |
| Location of Test: | Client's Premises, Kedron, QLD 4207 |
| Client Name: | Acrow Formwork & Scaffolding Pty Ltd |
| Client Address: | 280 Bilsen Rd, Geebung, QLD 4034 |
| Client Order No: | 320000344 |
| Client Job No: | Not specified |
| Project Details: | Strength Testing of supplied Uni-mesh/ Fire Retardant |
| Item Details as supplied: | Blue Uni- mesh FR2, Date of manufacture: 2023.12.15 |
| Test Procedure: | AS 1576.7 :2021 |
| Test Specification: | AS 1576.7: 2021 Appendix B |
| Acceptance Specification: | AS 1576.7: 2021 Appendix B, Sec B.6 |
| Client's Requirements: | Report Finding |
| Compliance: | The results of the testing undertaken on the supplied component comply with the requirements of AS 1576.7 Appendix B, Section B.6 |

| | | | |
|---|---|---|---|
| Technician/s: | Chris Raes<br>Ellie Rahbar | Approved by: | Fabian Lyons |
| | | Signature: | |
| | | Issue Date: | 26/03/2024 |

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# 7. Appendices

## **Appendix D** - Uni-Mesh FR2 Strength Test LT-HW-0001

AlfaTest
"Delivering Results"

AlfaTest Report No: 20240171M01 Date of Test: 19 March 2024

### Strength Testing

**Technical Details**

Material Spec: Uni- mesh/ Fire Retardant
**Test Equipment**
Equipment: Test frame/ Scaffolding Assemblies
Equipment: Steel Pendulum, 30 kg mass of nominal dimension 100mmx100mm

Test Restrictions/ Deviations: Mesh fixed and tightened to the scaffold by nylon zip ties in accordance with the client's fixing method for this application.
The test setup has been configured as per the client's instructions.

Note: Customer supplied information may affect the validity of the test results.
* Asterisk indicates client supplied information.

**Test Results**

| Sample Reference | Impact Force applied | Test height above the nominal point of impact as per AS 1576.7, Fig B.2 (h) | Impact location as per AS 1576.7, Fig B.1 | Result / Findings |
|---|---|---|---|---|
| M01: Blue Uni- mesh FR2, Date of manufacture: 2023.12.15 | 30 Kg | 1000mm | Point 01 | No hole or tearing observed at the point of impact of the pendulum. No fixings failure of encapsulation to the test assembly detected. |
| | | | Point 02 | No hole or tearing observed at the point of impact of the pendulum. No fixings failure of encapsulation to the test assembly detected. |
| | | | Point 03 | Two 30mm diameter holes were observed at the point of impact of the pendulum, which is within the standard requirement of being less than 50mm. No fixings failure of encapsulation to the test assembly detected. |

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# 7. Appendices

## **Appendix D** - Uni-Mesh FR2 Strength Test LT-HW-0001

AlfaTest "Delivering Results"

AlfaTest Report No: 20240171M01 Date of Test: 19 March 2024

### Strength Testing

**Photographs**

Photograph 1. General view of marking of received component.

Photograph 2. General view of M01- Blue Uni-mesh test set up.



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## **Appendix D** - Uni-Mesh FR2 Strength Test LT-HW-0001

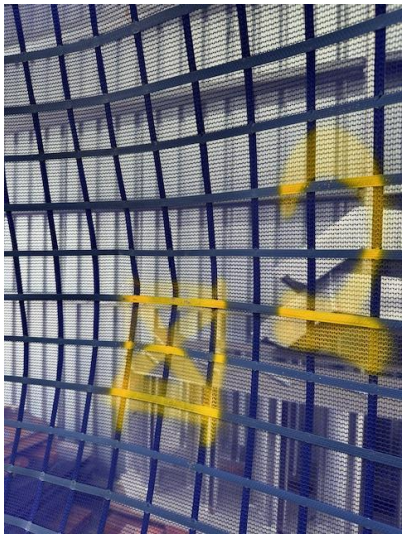
AlfaTest
"Delivering Results"

AlfaTest Report No: 20240171M01 Date of Test: 19 March 2024

### Strength Testing

**Photographs**

Photograph 3. Detail view of M01- Blue Uni-mesh at point 01 after test.



Photograph 4. Detail view of M01- Blue Uni-mesh at point 02 after test.

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## **Appendix D** - Uni-Mesh FR2 Strength Test LT-HW-0001

AlfaTest "Delivering Results"

AlfaTest Report No: 20240171M01 Date of Test: 19 March 2024

### Strength Testing

**Photographs**

Photograph 5. Detail view of M01- Blue Uni-mesh at point 03 after test.

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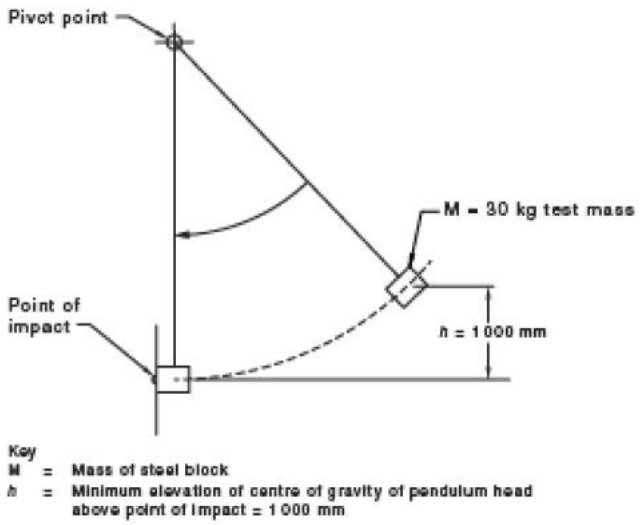
## **Appendix D** - Uni-Mesh FR2 Strength Test LT-HW-0001

AlfaTest
"Delivering Results"

AlfaTest Report No: 20240171M01 Date of Test: 19 March 2024

### Strength Testing

**Reference**




Reference 1. Pendulum test configuration as per AS 1576.7, Figure B.2.

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St Marys NSW 2760
P: 02 9219 1566

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Above Scaffolding NSW
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Lindfield NSW 2070
P: 1300 30 15 20

Regional NSW
Industrial Access
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Muswellbrook NSW 2333
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