

MONOKOTE® FIRE SPRAY FOR DUCT PROTECTION



MONOKOTE® is an industry-leading fireproofing fire spray for the protection of steel ductwork which brings with it over 50 years of proven performance in the field.

It's easy for contractors to apply and it is backed by Trafalgar's technical and field support specialists. This ensures that no matter how a building gets built, MONOKOTE® fireproofing will offer the highest grade of performance.



KEY FEATURES



- Fast, efficient application
- Tested to AS1530.4-2014 for internal & external fire
- FRL's up to 240/240/180
- Fully compliant with the NCC and AS1668.1
- Competitive spray thicknesses
- Low VOC
- Can be applied to ducts up to 2400 x 2400mm
- Approved access panels
- UL tested/listed factory

APPLICATIONS



- Kitchen Exhaust
- Smoke spill
- Smoke exhaust
- Fire stair pressurization
- Diesel pump exhaust
- Any steel duct that is constructed to AS4254.2

TRADES



MONOKOTE® is a registered Trademark of GCP Applied Technologies, Inc

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WHAT IS MONOKOTE®?

MONOKOTE® MK-6 HY is a single component, mill mixed fire spray that provides a cost-effective solution to fire rating of steel ductwork as well as structural steel elements. The material is supplied in sustainable 23.8kg packaging, and has a high yield (HY) when mixed and sprayed correctly. Tested to the latest version of AS1530.4-2014, MONOKOTE® is approved for use where there is fire risk inside of the ducts (internal fire), and/or where there is fire risk from outside of the duct (external fire).

GLOBAL REPUTATION

Based on its easy-to-use characteristics, global reputation and 50-year proven history, MONOKOTE® has been employed in some of the world's biggest projects. The MGM City Center in Las Vegas, the world's largest privately funded construction project, employed over 500,000 bags of MONOKOTE® fire spray. Likewise, the architects of Singapore's Keppel Bay Bridge and New York City's own Freedom Tower have each specified MONOKOTE® products to keep their buildings safe.

Trafalgar Group are proud to bring this technology, backed with Australian Standard fire testing and industry leading local support, to the Australian market.

DESIGNED FOR CONTRACTORS

MONOKOTE® has been specifically designed to be contractor friendly. The materials are typically spray-applied, and can be pumped easily into the upper floors of tall buildings. In addition to being less abrasive and less challenging to pump, users can also elect to inject MONOKOTE® accelerator to impact set time and density of the material.

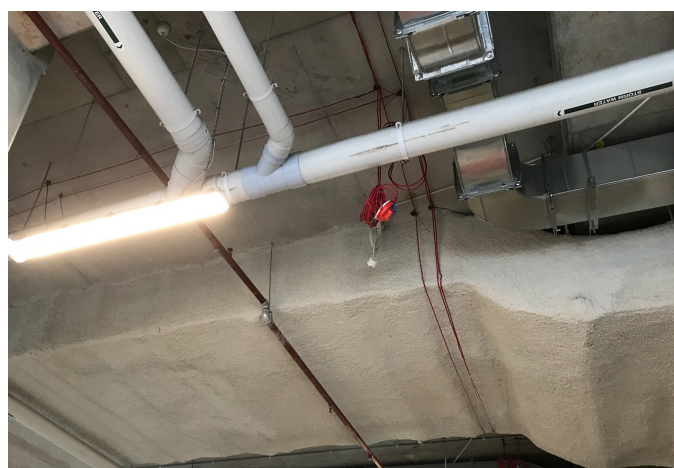
APPLICATIONS

MONOKOTE® is suitable for use for the fire protection of ventilation and air conditioning ducts that are constructed in accordance with A4254.2 (rigid ducts) such as:

- Kitchen Exhaust
- Smoke spill
- Smoke exhaust
- Combined kitchen exhaust/smoke
- Fire stair pressurization
- Diesel pump exhaust

Monokote also is also tested and approved for:

- Fire protection of structural steel columns and beams via AS4100 with section factors up to 365 Hp/A
- Interfaces with other structural steel protection boards like Corex board
- Coatbacks of steel members to secondary members
- Upgrading concrete floor slabs including steel decked slabs



SPECIFICATIONS



SPECIFICATIONS

| PHYSICAL PROPERTIES | LABORATORY TESTED VALUES | TEST METHOD |
|---------------------------------|---|-------------|
| Dry density, minimum average | 240 kg/m3 | ASTM E605 |
| Bond strength | 16.9 KPa | ASTM E736 |
| Compression, 10% deformation | 220 KPa | ASTM E761 |
| Air erosion | 0.00 g/m2 | ASTM E859 |
| High velocity air erosion | No continued erosion after 4 hours | ASTM E859 |
| Corrosion | Does not contribute to corrosion | ASTM E937 |
| Bond impact | No cracking, spalling or delamination | ASTM E760 |
| Deflection | No cracking, spalling or delamination | ASTM E759 |
| Resistance to mold growth | No growth after 28 days | ASTM G21 |
| Surface burning characteristics | Flame spread = 0 | ASTM E84 |
| | Smoke developed = 0 | |
| Combustibility | Less than 5 MJ/m2 total, 20 kw/m2 peak heat release | ASTM E1354 |

HEALTH AND SAFETY

When using MONOKOTE® applicators should be aware that the product is slippery when wet, and should take precautions for masking and signage where necessary.

Safety Data Sheets (SDS) for MONOKOTE® MK-6/HY and MK-6s are available on our website www.tfire.com.au

Monokote is not made from raw materials containing crystalline silica however like any spray applied material the safety precautions contained in the MSDS are best practice to follow.

In the interest of raising awareness of correct PPE and material safety, the use of appropriate PPE and methods will be promoted by Trafalgar



FIRE RESISTANCE LEVEL

FIRE RATING – HOW IS FIRE PERFORMANCE MEASURED?

For ducting applications, AS1530.4-2014 section 9 defines two separate fire test methods to represent fire exposure from inside the duct OR a fire outside of the duct. Both fire test methods include a suspended duct penetrating a wall or floor to evaluate the full system performance. An FRL (Fire Resistance Level) is assigned to the tested duct and protection system based on the exposure direction (internal or external fires). The FRL consists of 3 numbers, all given in minutes. Ductwork uses different FRLs based on the application, as shown below:

FRL 120/120/120 (example)



Structural Adequacy

For both internal and external fire conditions, the duct and supports must maintain their size and shape allowing for the duct to maintain its intended function.

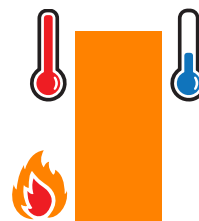


Integrity

EXTERNAL FIRE: The ability of the protected duct to prevent the passage of flames and hot gases into the duct.

INTERNAL FIRE: The ability of the protected duct to prevent the spread of hot gasses from escaping the duct.

Both tests include measurements at the wall or floor penetrations.



Insulation

EXTERNAL FIRE: Includes a 1- meter per second (1m/s) air flow through the duct, and temperatures are measured on the inside duct walls, the outside of the wall or floor penetration as well as the exit air stream. All locations must remain below a 180 degree temperature rise.

INTERNAL FIRE: Temperatures are measured at points on the outside of the duct protection material, and also on the face of the fire wall or floor next to the duct penetration. Temperatures must stay below a 180 degree rise.

Please contact Trafalgar at technical@tgroup.com.au for any enquiries

FRL TABLES

SPRAY THICKNESSES

INTERNAL FIRE & EXTERNAL FIRE

The following table reflects the required minimum spray thicknesses for internal fire applications. Please refer to the mechanical designers and/or AS1668.1 for the relevant requirements for your site (or choose the larger spray thickness as worst case design).

| FRL | Spray thickness (internal fire) | Spray thickness (external fire) |
|-------------|---------------------------------|---------------------------------|
| 60/60/60 | 37mm | 44mm |
| 90/90/90 | 47mm | 54mm |
| 120/120/120 | 54mm | 61mm |
| 180/180/180 | 64mm | 71mm |
| 240/240/180 | 64mm | 71mm |

- Max. duct size 2400x2400mm
- Design stresses for unprotected hangar systems:
 - 10N/mm2 up to 120/120/120
 - 6N/mm2 up to 240/240/180

Please contact Trafalgar at technical@tgroup.com.au for any enquiries

FIRE TEST AND ASSESSENT REPORT REFERENCES:

- **FC15909-01 – Monokote Spray thicknesses for internal and external fire**
- **FC17768-01 – Access panels (see over page) and includes both**
 - Frame build on site using Maxilite board, and
 - FDAP factory made and quality assured

FRL TABLES

ACCESS PANELS

FIELD FABRICATED

The Trafalgar ‘Field fabricated’ access panel is a simple yet robust solution to provide a quick and cost-effective access panel for cleaning, maintenance and inspections. The construction is tailored to on site assembly where a contractor can purchase the steel J-track, Maxilite board and screw fixings separately and build their own fire rated access points over the top of existing duct access panels. These access panels are rated for up to 2 hours applications (for higher FRLs please contact Trafalgar).

| Item | Name | Description |
|------|--|--|
| 1 | Steel Duct | As required per Monokote Approvals |
| 2 | Non-rated Duct Access Panel | - |
| 3 | Galvanised Steel Access Panel Frame | Minimum 1mm thick - 50 x 65 x 100mm - Internal opening up to 800 x 800mm |
| 4 | Maxilite Board 60mm | Extending 20mm past steel frame |
| 5 | Maxilite Fixings Screws | 8g x 75mm min |
| 6 | Spray Reinforcement Mesh & Pins | As required per Monokote Approvals |
| 7 | Monokote Spray | Applied to the full height of the steel framing |
| 8 | Steel Rivet or Tek Screw Fixings for frame | |

Drawing Name: Overview

Project Title: Field-Made FDAP DWG

Drawing No. : 1

Sheet: 1 of 1

Date: 2/06/2023

Scale: NTS

Test Standard: AS1530.4

Fire resistance level:

Based on Report No.:

Codes:

Drawn By: SM

Checked By: JH

Revision:

☐ STANDARD DRAWING

☐ PROJECT DRAWING

Date:

No.:

NOTICE:

NOTE: ALL DIMENSIONS ARE IN MILLIMETRES (mm)

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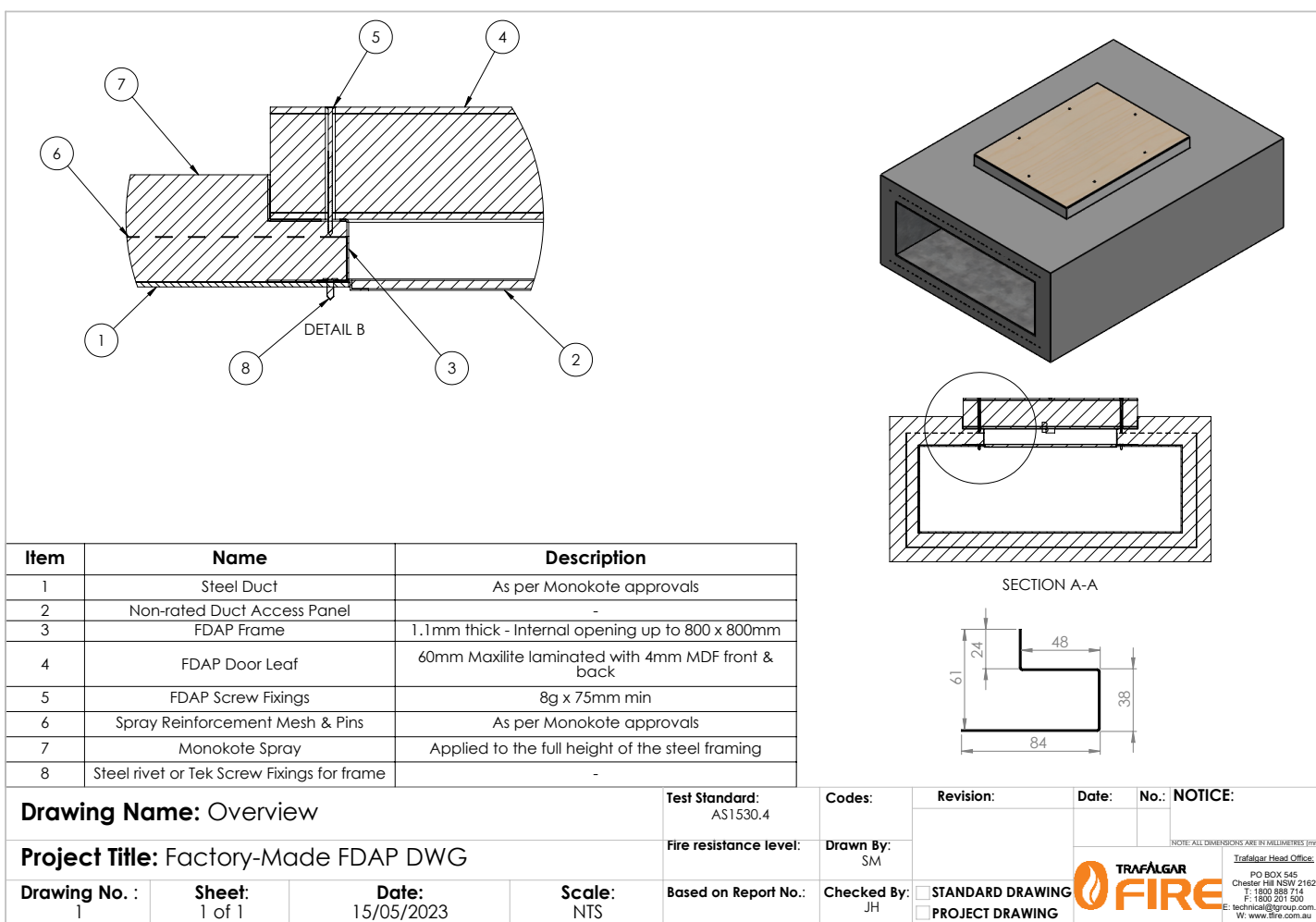
W: www.tfi.com.au

FRL TABLES

ACCESS PANELS

FDAP FACTORY-BUILT

The Trafalgar factory made FDAP access panels are made in ISO9001 accredited Sydney manufacturing facility, and allow for a reliable factory made access panel that can be installed quickly and easily onto ductwork over existing duct access panels or switchgear. Custom sizes are also available to suit site needs. These access panels are rated for up to 2 hours applications (for higher FRLs please contact Trafalgar).



FDAP SIZES

| Item # | Size (internal clear opening) | To sit over duct access panel size |
|--------------|-------------------------------|------------------------------------|
| FD-AP-1L-AP0 | 708 x 558mm | AP0 |
| FD-AP-1L-AP1 | 558 x 443mm | AP1 |
| FD-AP-1L-AP2 | 433 x 301mm | AP2 |
| FD-AP-1L-AP3 | 304 x 214mm | AP3 |

PLANNING, ESTIMATING AND EQUIPMENT

YIELD AND MIXING

For comprehensive information on estimating the applied yield and water usage using both batch mixing or continuous mixers, please refer to the Monokote MK6-HY simplified Yield Chart here: [MK6 HY YIELD CHART](#)

Please note that the drying times between coats will vary depending on site conditions. Typically allow 3-4 hours between applications, unless accelerative additives are injected via the mixing nozzle.

EQUIPMENT


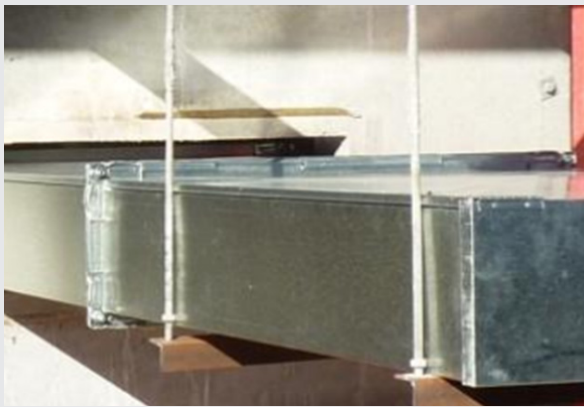


MONOKOTE® spray systems can be used with a wide range of factory-made pumps and mixing machines including:

- **Batch mixers (recommended)**
- **Continuous mixers**
- **Accelerated mixing (with additives, contact Trafalgar for more information)**
- **Piston, hydraulic, rotor/stator and squeeze pumps**



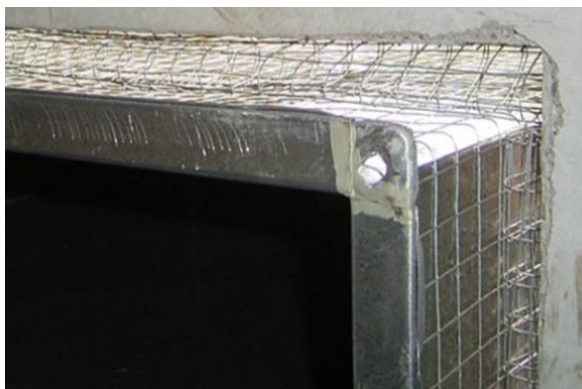

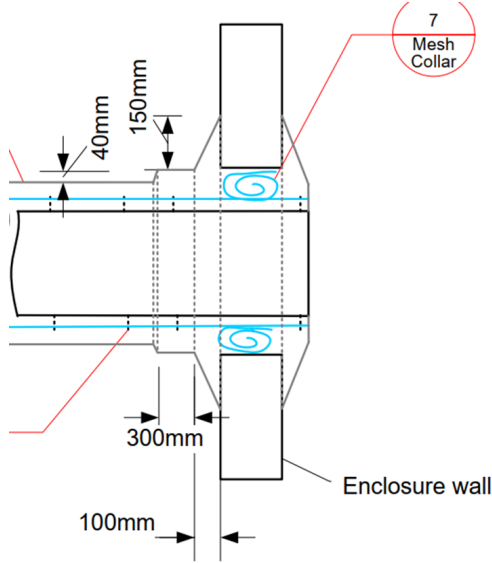
INSTALLATION

COMPONENTS

| Item | Specification | Image |
|----------------------------------|---|--|
| Duct | Steel duct up to 2400x2400mm minimum 1mm thick in accordance with AS4254.2 with tie rods and supports as required. |  |
| Duct Supports | Duct to be supported in accordance with AS4254.2. Threaded rods designed to not exceed 10MPa for 2 hour applications, and 6MPa for 4 hour applications. (Contact Trafalgar for calculation assistance or consult Mechanical contractor on site) |  |
| Sticky Pins / welded pins | 50x50mm self-adhesive 'sticky' pins with a 2.75mm shaft in a grid of 400mm centers. Welded pins also suitable. |  |
| Mesh | 25x25mm with 1.2mm thick steelwire mesh, wrapped around the ducts after the first coat of Monokote is applied. Spring washers positioned each side of the mesh locating the mesh mid depth. |  |

INSTALLATION

COMPONENTS

| Item | Specification | Image |
|--------------------------------------|---|--|
| Fire wall penetrations Infill | Mesh should be rolled up and inserted into the gaps in the fire wall. |  |
| Spray thickness | Monokote is to be applied with the same depth of cover over joints and support angles as the bulk of the duct. Refer to FRL tables for spray thickness on page 6 . |  |
| Fire wall collar details | Starting 300mm away from the wall, build up the spray thickness an extra 40mm. Finish with a fillet of spray 150mm onto the wall, 100mm onto the duct. Refer to the technical drawings in the rear of this manual for full details. |  |

INSTALLATION

COMPONENTS

| Item | Specification | Image |
|---|---|--|
| Access panel – Field Made | An access hatch can be constructed on site using 60mm Maxilite board and 50x65x100mm, 1mm thick steel J-track and 8gx75mm screws. Refer to technical drawings above for specifications. Install the hatch prior to spray. |  |
| Access panel – Factory Made | Alternatively, a Trafalgar Factory made Fyre Duct Access Panel (FDAP) can be purchased off the shelf that is supplied with a screw fixed fully reusable door that is laminated with MDF for long term service life. Install the hatch prior to spray. |  |
| Oversized openings and out of line fire dampers | Tested solutions available - Contact Trafalgar for details. |  |

INSTALLATION

DUCT SUPPORTS

Ducts should be constructed in accordance with AS4254.2-2012 with minimum specification as shown in the tables below.

| Duct Size Range (up to) | Duct Construction | Steel Angles at Fire Wall Penetrations | Recommended Support Details | Hanger Rods |
|-------------------------|---|--|---|---|
| 1000x250mm | 0.6mm mild steel with TDC flanges and lock form seals | Not required | 50x50x5mm steel angle and M12 threaded rod at 1200mm centers | Duct to be supported in accordance with AS4254.2. Threaded rods designed to not exceed 10MPa for 2 hour applications, and 6MPa for 4 hour applications. |
| 1500x1500mm | 1mm mild steel with TDC flanges and lock form seals. | 25x25 x 3mm angles both sides of wall, secured to wall and to the duct | 50x50x5mm steel angle underneath the duct and M12 threaded rod at 1200mm centers. 25x25 x 3mm angle across the top of the duct. | |
| 2400x2400mm | 1mm thick steel and include at least 1x tie rod through mid width of the duct at the location of the trapeze supports and wall penetrations | 25x25 x 3mm angles both sides of wall, secured to wall and to the duct | Tie rods, trapeze and hangers all must installed above and below the duct, designed in accordance with AS4254.2 requirements. | |

Please contact Trafalgar at technical@tgroup.com.au for any enquiries

ENVIRONMENT AND SUSTAINABILITY

For decades, Australia has lagged behind the rest of the world when it comes to environment and sustainable building practices and products. The MONOKOTE® technology brings the opportunity to specify and use a system with a strong sustainability profile that gives building professionals, building owners, and occupants greater peace of mind.

CLAIMS YOU CAN COUNT ON

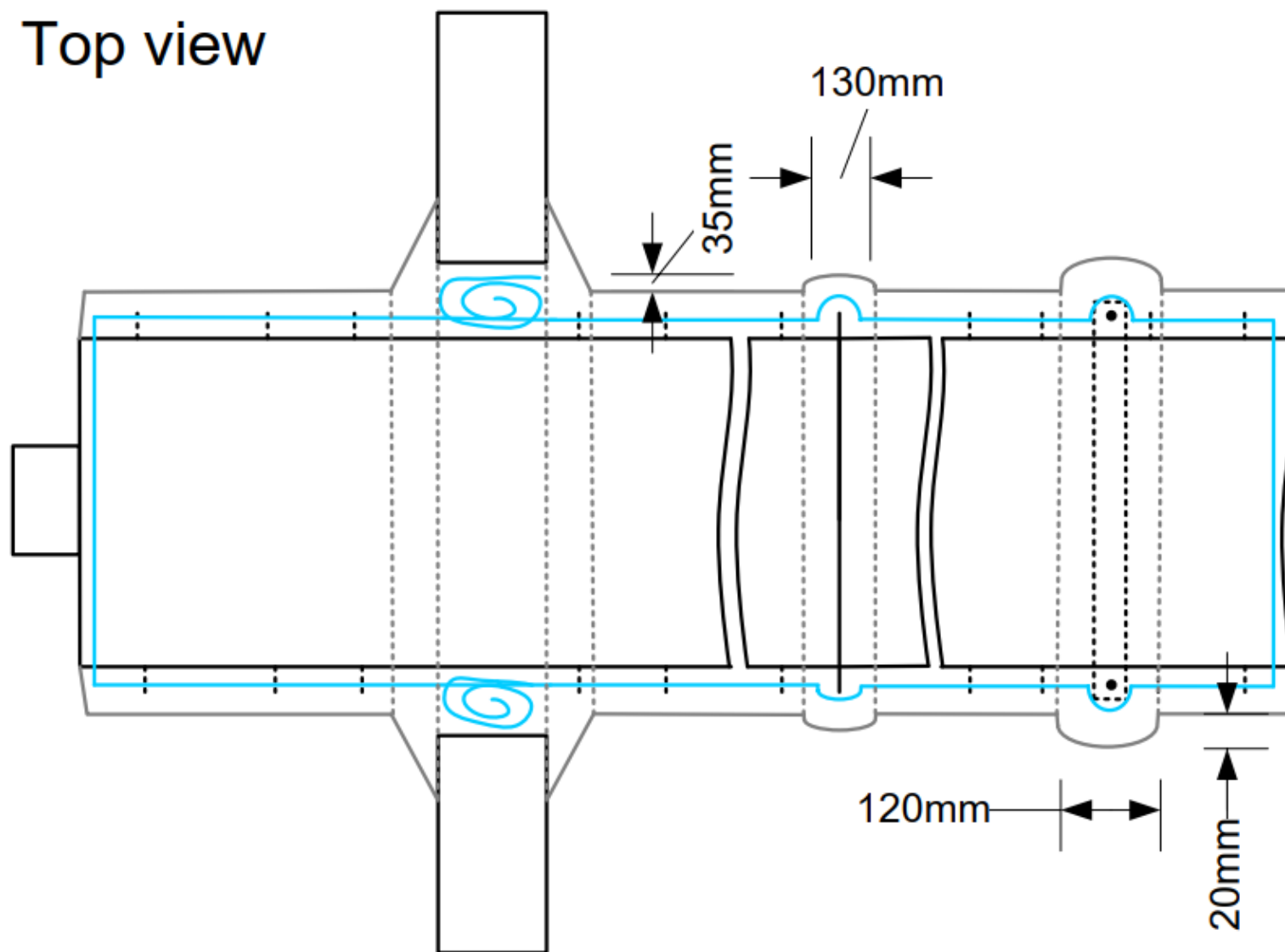
All information related to the sustainability of MONOKOTE® SFRM fireproofing products has been investigated and verified by third parties. Environmental industry leaders, such as Athena, ILFI, UL Environment, and ASTM have reviewed these claims. Meeting these industry standards gives the end user confidence that the claims made are accurate.

| Green Attribute | LEED v4 Credit | How MONOKOTE® Fire Protection Products can help |
|---|---|---|
| Recyclability | Construction and Demolition Waste Management | In areas where facilities exist, the packaging for all MONOKOTE® MK-6 HK is recyclable. These materials can contribute to two waste streams: paper (from bags) and wood (from pallets) |
| Recycled Content | Building Product Disclosure and Optimization—Sourcing of Raw Materials | Depending on the material that’s right for your job, MONOKOTE® products have up to 8% recycled content. |
| Environmental Product Declaration / Life Cycle Assessment | Building Product Disclosure and Optimization—Environmental Product Declarations | The ASTM-certified Environmental Product Declaration (EPD) is a Type III product-specific EPD covering all MONOKOTE® products. This EPD also covers our Life Cycle Assessment (LCA). |
| Ingredient Transparency | Building Product Disclosure and Optimization—Material Ingredients | Our Declare labels and our UL-verified Product Lens transparency report can contribute toward the 20 disclosure statements required to meet the credit threshold. |
| VOC Limits | Low Emitting Materials | MONOKOTE® products are third-party tested to meet both the VOC emissions requirements and the VOC content requirements of LEED v4 (0g/L) |
| Acoustics | Acoustic Performance | In addition to fire resistance properties, MONOKOTE® fireproofing materials provide NRC (Noise Reduction Coefficient) and STC (Sound Transmission Coefficient) values, reducing the need to purchase and install additional materials for soundproofing within the building envelope. |

Fire Wall Penetration for External Fire

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Wall Penetration for Internal Fire

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