



TECHNICAL DATASHEET
MATERIAL SAFETY DATASHEET
SYSTEM DRAWING
INSTALLATION INSTRUCTION
METHOD STATEMENT
TEST REPORTS

FIREMASTER 2H



PRODUCT CHARACTERISTICS

Genotek FireMaster® blanket is a non-combustible, flexible matt manufactured from alkaline earth silicate fibres suitable for use in both cellulosic, hydrocarbon and jet fire protection applications.

The patented fibre formulation used gives enhanced solubility in the human body together with excellent thermal and acoustic properties.

FireMaster® blanket has the same appearance as Refractory Ceramic fibre and can be used in the same range of fibre protection applications with equivalent thermal insulation performance. No binders are used during manufacture thus there is no risk of smoke or toxic gas emission or loss of strength during a fire due to binder burn out.

FireMaster® is easy to handle being flexible and resilient with good tensile strength. No special installation tools are needed and the blanket can be cut with a sharp knife. The blanket is supplied in rolls each marked with key production data, packed in a specially printed carton.

A significant number of fire tests have already proven the performance of the FireMaster® blanket for up to 4 hours in hydrocarbon fires and one hour in jet fires. Fire protection is achieved with lower thickness and weight than with other Mineral Fibre compositions.

FEATURES

- Colour : white with key production data printed on surface
- Linear shrinkage (24 hrs at 1000°C) <1%
- Loss on ignition (5 hrs at 1000°C) <0.1%

FIRE PROTECTION PROPERTIES

- **Non-combustibility:** IMO A799 (19) using ISO 1182-1990 (E) method Approved product number under EU Marine Equipment Directive: 0062

All other properties of FireMaster® blanket will be as the ceramic fibre based FireMaster® blanket, which are detailed in the following sections.

FIRE HAZARD PROPERTIES PER ASTM E-84 METHOD

- Flame spread: zero
- Fuel contributed: zero
- Smoke developed: zero

FireMaster® blanket is inert and resistant to mould growth and attack by vermin.

APPLICATIONS

- 'A' class and IMO HSC steel, aluminium and PVC composite bulkhead and deck insulation in high speed craft
- Upgrading of fire performance of composite panels to meet IMO room corner test requirements
- H class and A class steel bulkhead and deck fire protection for ships and offshore platforms
- Hydrocarbon and Jet fire protection of process pipes and vessels
- Infill to fire doors and cladding panels
- Construction joints
- Cellulosic and hydrocarbon fire protection of structural steelwork
- Ductwork fire protection
- Cable tray fire protection

THERMAL INSULATION PROPERTIES

- For insulation under ambient conditions the following maximum thermal resistance (R value) figures may be used for calculation of overall thermal transmittance (U value).

Thermal conductivity (EN 1094-1) @ mean temperature of:

	64kg/m ³	96kg/m ³	128kg/m ³	160kg/m ³	192kg/m ³
200°C	0.07	0.06	0.06	0.06	0.06
300°C	0.09	0.06	0.06	0.07	0.0
400°C	0.12	0.11	0.10	0.09	0.09
500°C	0.17	0.14	0.13	0.12	0.11
600°C	0.22	0.17	0.16	0.15	0.14

FireMaster® provides good thermal insulation over its entire operating temperature range.

Thickness of Blanket	R Value (m ² K/W)
25mm	0.73
38mm	1.11
50mm	1.46
75mm	2.19
100mm	2.92

Basis: Thermal conductivity of 96kg/m³ density measured at 20°C to BS 874 of 0.0342 W/mK.

ACOUSTIC INSULATION PERFORMANCE

Sound Absorption

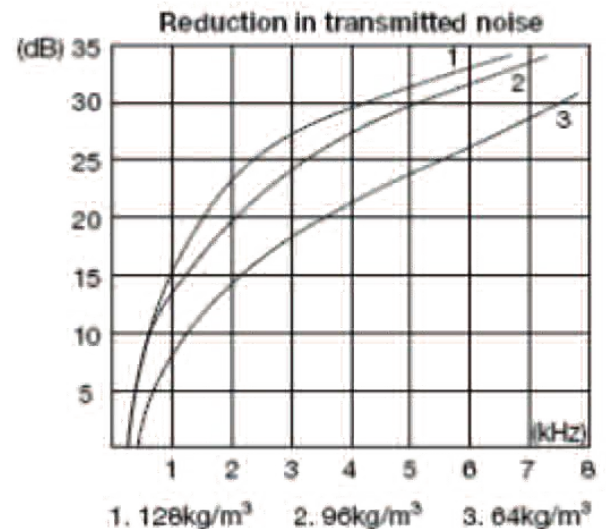
FireMaster® blanket is an excellent acoustic insulation material. The data below is the result of tests carried out on FireMaster® blanket to BS 3638. Further details are available on request.

Sound absorption coefficient

Frequency (Hz)	25mm / 96kg/m ³	25mm / 128kg/m ³
125	0.07	0.09
250	0.29	0.54
500	0.73	0.86
1000	0.92	0.94
2000	0.96	0.945
4000	0.99	0.96
Noise reduction coefficient	0.72	0.82

Sound Attenuation

The graph below summarizes data obtained in acoustic tests carried out to ASTM E336-71, on the attenuation of noise transmitted through 25mm thick FireMaster® Blankets as a function of sound frequency. Further details are available on request.



AVAILABILITY AND PACKAGING

FireMaster® is available in a wide variety of thicknesses and densities. See the table below for details. Standard size: 610mm or 1220mm wide. The roll length varies with thickness to use one standard carton size. Each roll is identified with the product thickness density, grade and key production data. FireMaster® Blanket is also available in a strip form and with custom protective coverings and finishes such as aluminium foil glass cloth and steel mesh. Further details are available on request.

Density k/m ³	6mm	13mm	20mm	25mm	38mm	50mm	63mm	70mm
64		•	•	✓	✓	✓		
96		✓	✓	✓	✓	✓	•	•
128	•	✓	✓	✓	✓	✓		
160	•	•	•	•	•			
190	•*	•*	•*	•*				
Roll Length	21.60m	14.64m	9.76m	7.32m	4.88m	3.66m	2.3m**	2.3m**

**2300mm lengths are supplied as flat slabs not rolls.

✓ = Available ex-stock

• = Available to order



MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product Name	: Genotek FireMaster Series Fire Barrier System (Blanket)
Product Use	: Non-combustible, flexible mat for fire, thermal, and acoustic protection applications, including cellulosic, hydrocarbon, and jet fire protection.
Manufacturer or Supplier's Details	: Genotek™ Ikan Inc. P.O. Box 123826 Dubai, United Arab Emirates T: +971 4 3285454 F: +971 4 3285335

SECTION 2. HAZARDS IDENTIFICATION

Classification	: Classified by the manufacturer of the base material (Morgan Thermal Ceramics) as Carcinogenicity Category 1B (May cause cancer by inhalation) for Refractory Ceramic Fibres (RCF), which the product has equivalent thermal performance to, though the FireMaster blanket uses an alkaline earth silicate fibre which has enhanced solubility in the human body. The supplied product information confirms non-combustibility and zero smoke/toxic gas emission in its unfired state.
Routes of Entry	: Inhalation (of airborne dust/fibers), Skin Contact, Eye Contact.
Health Hazards (Acute)	: Dust generated from handling may cause temporary, mild mechanical irritation to the eyes, skin, and respiratory tract.
Health Hazards (Chronic)	: The product is manufactured from alkaline earth silicate fibers with enhanced solubility. However, it has the same appearance and can be used in the same range of applications as Refractory Ceramic Fibre (RCF). RCF is classified as a possible human carcinogen (Group 2B by IARC). Note: Continuous use of similar ceramic fibers at high temperatures (e.g., >900°C) can lead to the formation of crystalline silica (cristobalite), a known human carcinogen (IARC Group 1).
Physical Hazards	: Non-combustible

SECTION 3. INFORMATION ON INGREDIENTS

Component	: Alkaline Earth Silicate Fibres	: Binders
CAS Number	: N/A (Proprietary Fibre Formulation)	: None used in manufacture
Concentration %	: High (Main component)	: 0%
Hazard	Suspected carcinogen by inhalation (similar to RCF), Mechanical irritant (dust)	: N/A



MATERIAL SAFETY DATA SHEET

SECTION 4. FIRST AID MEASURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed by installers and users.

Eye Contact	: Flush immediately with large amounts of lukewarm water for at least 15 minutes, holding the eyelids away from the eyeball. Do not rub eyes. Seek medical attention if irritation persists.
Skin Contact	: Do not rub or scratch the exposed skin. Wash thoroughly with soap and water. Use a skin cream or lotion. Change into clean clothing.
Inhalation	: Move the person to a dust-free area, drink water, and blow the nose to clear the throat. Seek medical attention if irritation persists.
If Swallowed	: Unlikely route of exposure. Relocate to a clean, fresh air environment and drink plenty of water. Seek medical help if symptoms persist.

SECTION 5. FIRE-FIGHTING MEASURES

Flammability	: Non-combustible. The product itself does not burn.
Extinguishing Media	: Use extinguishing measures appropriate for the surrounding fire.
Specific Fire Hazards	: No risk of smoke or toxic gas emission due to binder burn out during a fire, as no binders are used in manufacture.
Protective Equipment	: Wear full bunker gear and positive pressure self-contained breathing apparatus for the surrounding fire.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Avoid creating airborne dust. Workers should wear gloves, goggles, and an approved respirator.

Methods and Materials for Containment and Cleaning Up

Clean up dust carefully. Use wet sweeping or a high-efficiency (HEPA) filtered vacuum to remove dust/fibers. Do not use compressed air or dry sweeping.

Environmental Precautions

Avoid cleanup procedures that could cause water pollution.

SECTION 7. HANDLING AND STORAGE

Handling	: Handle the blanket carefully to minimize airborne dust. It can be cut with a sharp knife, and no special installation tools are needed. Wear appropriate PPE (see Section 8).
Conditions for safe storage	: Store in a manner to minimize airborne dust.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	: Use local exhaust ventilation or point of generation dust collection during operations that generate dust (e.g., cutting).
Respiratory Protection	: A NIOSH certified respirator with a filter efficiency of at least 95% (e.g., N-95) should be used in dusty conditions.
Skin Protection	: Wear loose-fitting, long-sleeved shirts and pants, or other appropriate clothing to protect against irritation. Washable or disposable clothing may be used. Avoid taking unwashed work clothing home. Wear gloves.
Eye Protection	: Wear safety glasses, goggles, or face shields, as necessary, to prevent eye irritation.
Hygiene	: Handle in accordance with good industrial hygiene practices. Wash hands before eating, drinking, or using the toilet. Remove dust and fibers from the skin after exposure.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Flexible mat/blanket.
Odor	: Odorless
Colour	: White.
Melting Point	: Not explicitly stated, but high-temperature applications up to 1000°C (linear shrinkage <1%) are noted. Similar ceramic fiber blankets have melting points over 1760°C (3200°F).
Solubility	: Negligible in water. The fiber formulation has enhanced solubility in the human body.
Flammability	: Non-combustible (Flame spread: zero; Smoke developed: zero).

SECTION 10. STABILITY AND REACTIVITY

Stability	: Stable.
Reactivity	: Inert and non-reactive as supplied.
Incompatible materials	: Hydrofluoric acid, Phosphoric acid, and Alkaline solutions are generally incompatible with similar ceramic fibers.
Hazardous decomposition products	: None, as supplied. Respirable fibers/cristobalite may be released during after-service removal of material that has been exposed to sustained high temperatures (e.g., >900°C).

SECTION 11. TOXICOLOGICAL INFORMATION

Basis of Toxicity	: Mechanical irritation from fibers and dust. Potential for chronic health effects from respirable fibers/dust (see Section 2).
Carcinogenicity	: The product uses alkaline earth silicate fibers with enhanced solubility in the human body. However, it is an alkaline earth silicate fiber insulation. Similar Refractory Ceramic Fibers (RCF) are classified as a Group 2B - Possibly carcinogenic to humans by IARC. Note: After-service material that has been exposed to high temperatures can form cristobalite, which is classified by IARC as Group 1 - Carcinogenic to humans.
Other Effects	: Inert and resistant to mould growth and attack by vermin.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity	: Not hazardous to the environment.
Ecotoxicology Assessment	: Insoluble and inert in soil and water.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	: Collect waste in suitable containers. : Dispose of in accordance with local regulations as non-hazardous mineral waste.
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SECTION 14. TRANSPORT INFORMATION

UN Number	: Not regulated as a dangerous good.
Transport Hazard Class	: Transportation classification not required.
Packing Group	: Not applicable
Marine Pollutant	: No

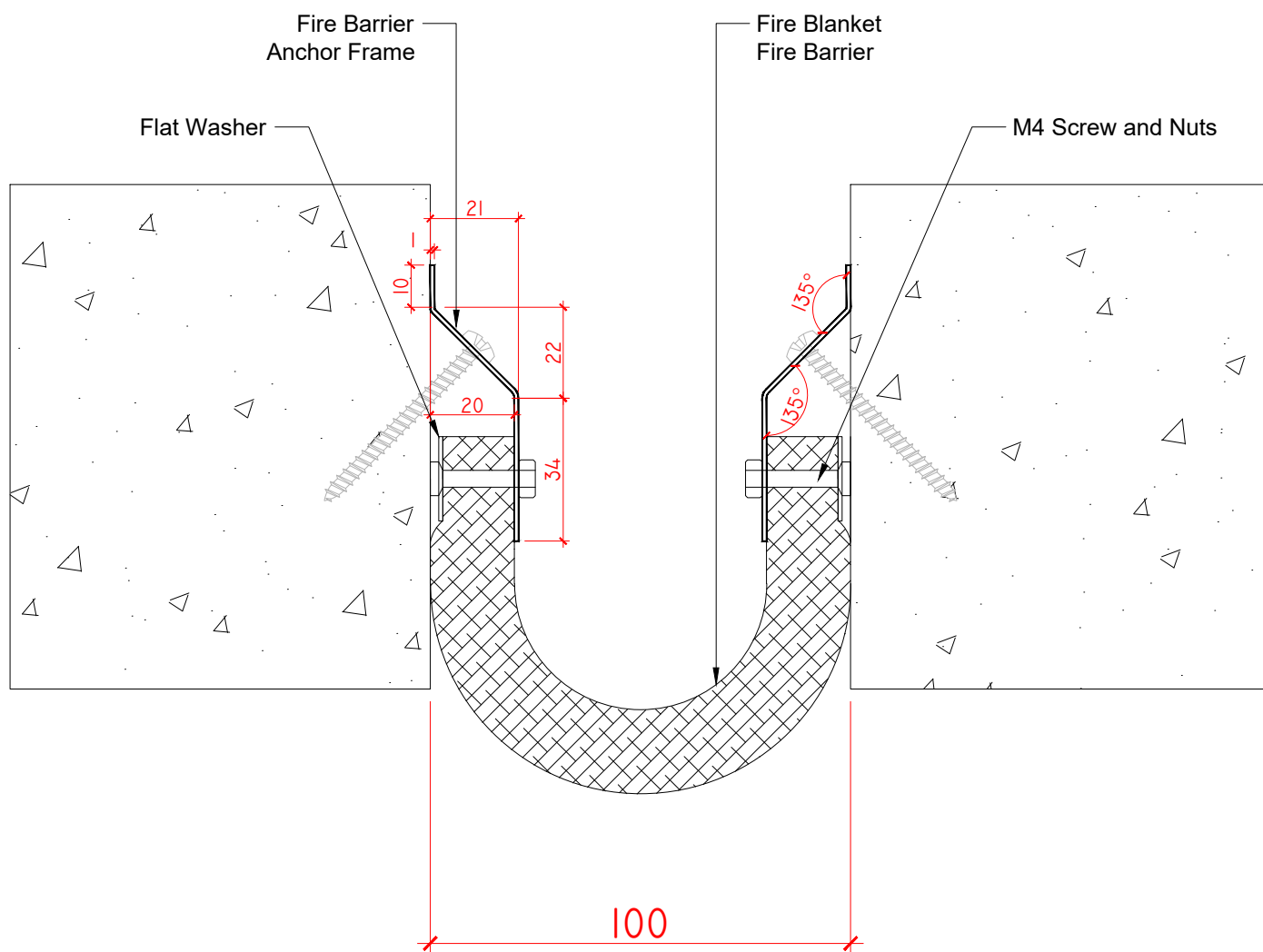
SECTION 15. REGULATORY INFORMATION

Not classified as hazardous according to OSHA, EU, or WHMIS.

All components are listed on TSCA and other international inventories.

SECTION 16. OTHER INFORMATION

Prepared in accordance with OSHA Hazard Communication Standard 29 CFR 1910.1200 and GHS guidelines.



GENOTEK

PRODUCT TYPE: FIREMASTER FIRE BARRIER

APPLICATION: FLOOR OR WALL

APPROVED BY CLIENT:

The following installation instructions are very important. Read them carefully and be sure you understand them completely before you begin any work.

SUBSTRATE

GENOTEK recommends that the concrete poured around joints and block-outs be vibrated before it can cure. This will help minimize air pockets in the concrete around the joint and block-outs. In addition, GENOTEK recommends leaving the concrete forms in place in the block-out until just prior to the installation of the joint cover system. This will help protect the block-out from potential damage during the work of other sections.

SURFACE PREPARATION

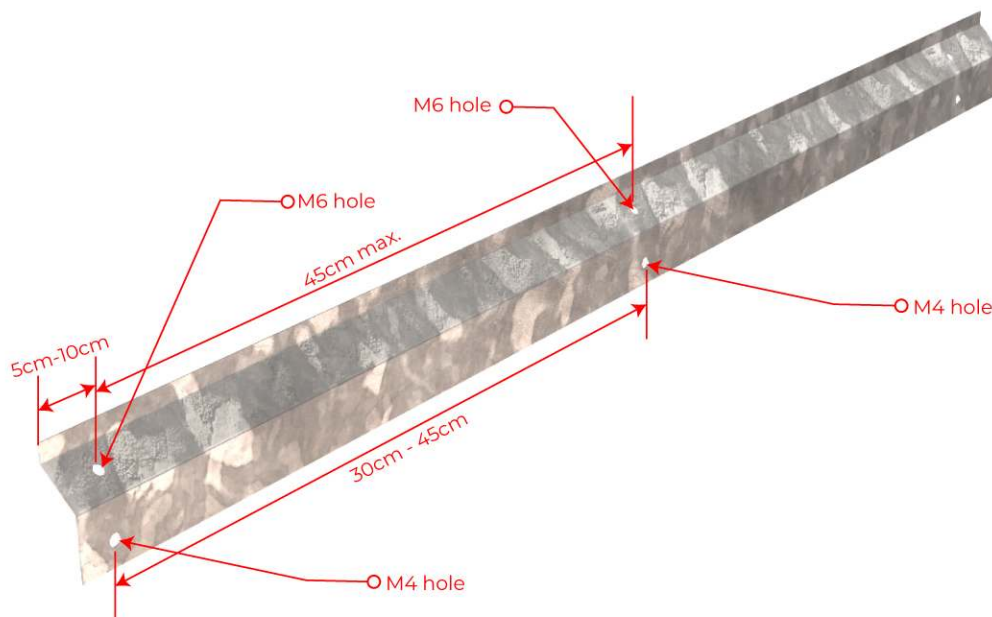
The concrete surface must be clean, dry, and free of all dirt and contaminants and must be leveled. Any significant unevenness in the deck surface or spalling at the joint edge must be repaired with a suitable patching material.

STEP 1. REVIEW APPROVED SHOP DRAWING

Review GENOTEK approved shop drawings for types and locations.

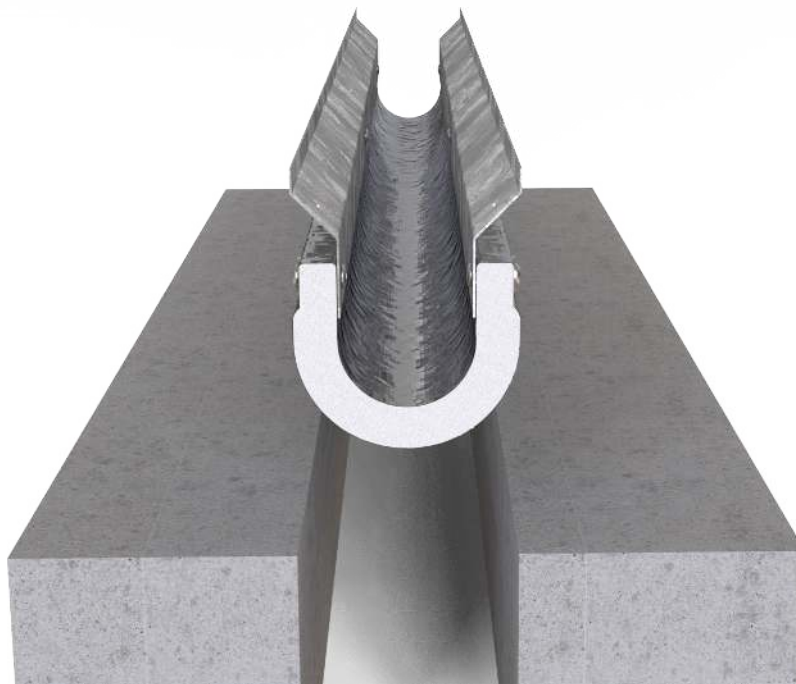
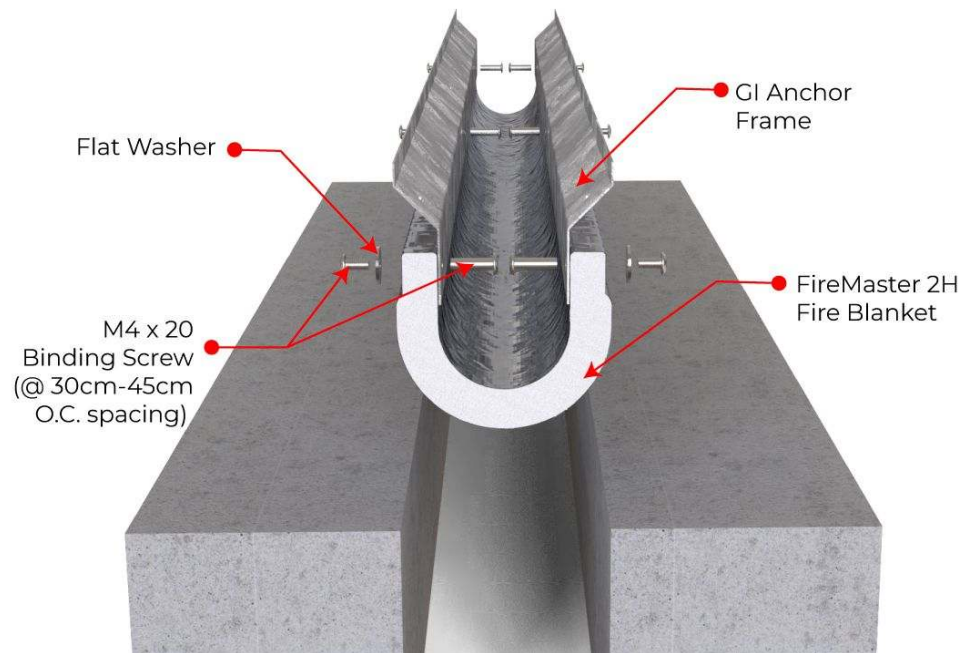
STEP 2. FRAME DRILLING

1. If the GI anchor frame is not pre-drilled, drill a M4 hole for the binding screw and M6 for the anchor bolt as shown in the image below. The hole should start or end 5cm to 10cm from the edge of the frame. The maximum spacing for the anchor bolt will be 45cm and the spacing of the holes for the binding screw will be ranging from 30cm to 45cm.



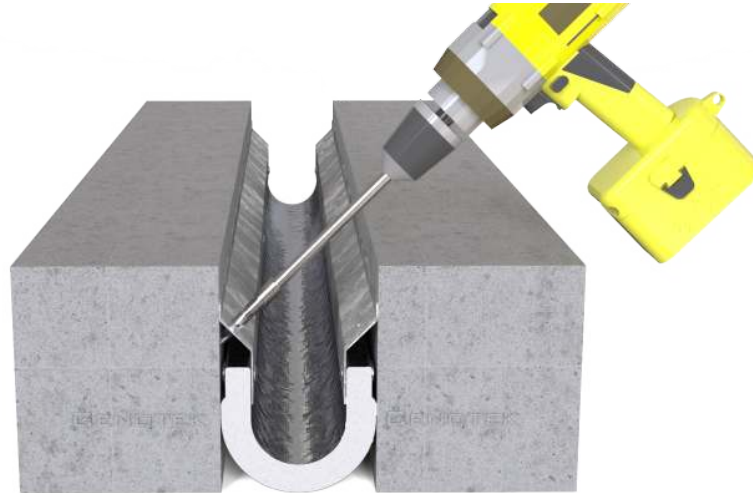
STEP 3. PRE-ASSEMBLY

Pre-assemble the GI anchor frame with the fire blanket as shown on the image below;



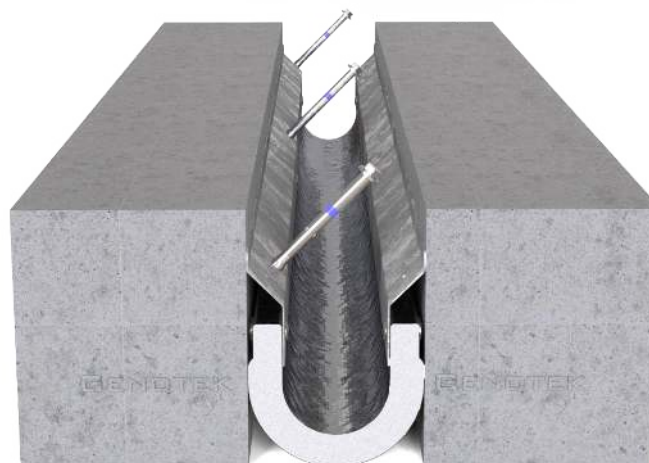
STEP 4. SUBSTRATE DRILLING

Insert the pre-assembled FireMaster into the gap. Using the pre-drilled hole in the anchor frame as a template, drill into the concrete or substrate at a 45° angle, ensuring alignment with the anchor hole as illustrated in the image below.

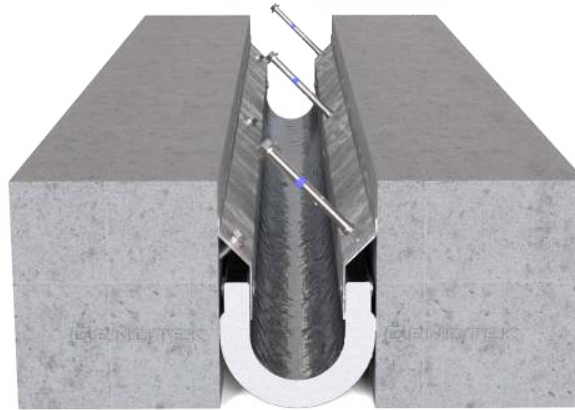


STEP 5. FIXING

Fix the FireMaster inside the joint width using a M6 x 70 anchor bolt.



Fix also the opposite side.



The installed FireMaster should look like the image below.



STEP 6. INSTALLING EXPANSION JOINT COVERS

After installation of fire barrier, expansion joint cover can now be installed. Please refer to the expansion joint installation instructions to proceed.

1. SCOPE

To install the FireMaster® Fire Barrier system at structural expansion joints in floors or walls, ensuring fire resistance, acoustic insulation, and movement accommodation. This method reflects the correct pre-assembly and anchoring procedure.

2. MATERIALS & TOOLS

- FireMaster® blanket (specified thickness and density)
- Galvanized steel anchor frame assembly
- M4 screws, nuts, and flat washers (for pre-assembly)
- Structural dowels and concrete screws (for final installation)
- Drill with masonry bits
- Torque wrench
- Utility knife or insulation cutter
- PPE: gloves, goggles, dust mask

3. PRE-INSTALLATION CHECKS

- Verify joint dimensions and movement requirements against design specs.
- Ensure substrate surfaces are clean, dry, and free of debris.
- Confirm blanket density and thickness per fire rating and acoustic requirements (e.g., 25mm / 128kg/m³ for NRC ~0.82).
- Review drawing tolerances (+3% extrusion variation noted).

4. INSTALLATION PROCEDURE

A. Pre-Assembling the Fire Barrier Module

1. Cut FireMaster® blanket to match joint length.
2. Position blanket within the galvanized anchor frame channel.
3. Secure blanket to frame using M4 screws, nuts, and flat washers at designated intervals.
4. Ensure blanket is compressed evenly and sits flush within the frame.
5. Inspect assembly for continuity and alignment before installation.

B. Installing the Pre-Assembled Unit

1. Position the pre-assembled fire barrier centrally over the expansion joint.
2. Mark anchor points on the substrate based on frame hole pattern.
3. Drill pilot holes using appropriate masonry bit.
4. Insert dowels and secure the frame using concrete screws.
5. Torque fasteners to manufacturer's recommended values.
6. Confirm that the blanket remains undisturbed and compressed within the frame.



Genotek FireMaster

Fire Barrier System

METHOD STATEMENT

C. Finishing

- Apply protective foil or mesh over exposed blanket surface if specified.
- Label installation with product ID and installation date for traceability.
- Clean surrounding area and remove debris.

5. QUALITY ASSURANCE

- Conduct visual inspection for alignment, fastener torque, and blanket integrity.
- Verify fire barrier continuity across joint length.
- Optional: perform acoustic attenuation test or thermal imaging for insulation verification.

6. DOCUMENTATION

- Record installation parameters: joint width, blanket spec, fastener type, and torque values.
- Include annotated photos of installed system.
- Submit prequalification and compliance documentation as required

7. MAINTENANCE & ACCESS

- FireMaster® blanket is inert and resistant to mold and vermin.
- No binder burnout risk—no smoke or toxic gas emission during fire.
- Recommend periodic inspection every 12–24 months, especially in high-movement zones.

Date: 16.09.2025

Morgan Advanced Materials
Murugappa Morgan Thermal Ceramics Ltd.,
United India Building, 3rd Floor,
Sir Pherozshah Mehta Road, Fort,
Mumbai- 400001, INDIA
T: +91 22 22613968
F: +91 22 22662289

TO WHOMSOEVER IT MAY CONCERN

Subject: Applicability of Morgan Thermal Ceramics (Firemaster) Test Reports and Certifications to Genotek Products.

The materials supplied by Genotek under Firemaster series are made from Morgan Ceramics under the Firemaster brand have been tested, evaluated, and certified by UL and other accredited laboratories against internationally recognized standards. These include, but are not limited to:

1. Protocol of European Commission (ECB/TM 27 Rev 7, 1998) – Confirming non-carcinogenic properties.
2. ASTM E136-93 & UL 723 – Confirming non-combustibility.
3. ASTM E1966 UL 2079 – Confirming fire resistance rating of 2 hours.
4. ASTM E1966 UL 2079 - Confirming fire resistance rating of 3 hours.
5. Internal Test Report CC 92153, FP 1738, M250520017/M250520017-10 – including photographs, installation details, and performance verification.

We hereby confirm that the Genotek range of products is manufactured using the same materials and processes as the tested and certified Firemaster systems supplied by Morgan Thermal Ceramics. Accordingly, the test reports, certifications, and approvals listed above are fully applicable to Genotek products.

Please find enclosed copies of the referenced test reports and certifications for your review and record.

Should you have any further questions or require clarifications, please feel free to contact us.

For **MORGAN THERMAL CERAMICS LTD.,**



Vikas V. Pisal
Senior Manager – Business Development
+91 7338857371
Email Id: vikas.pisal@morganplc.com

XHEZC.JF49 - Firestop Systems

XHEZC - Firestop Systems

See General Information for Firestop Systems

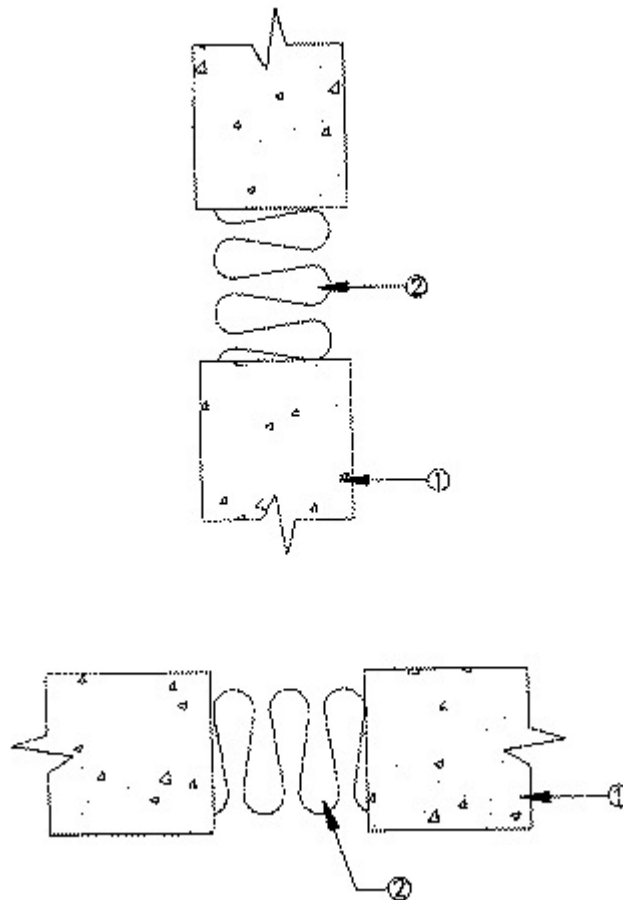
System No. JF49

February 19, 2010

(For Horizontal or Vertical Separations)

F and FH Ratings — 3 h

FT and FTH Ratings — 2 h



1. **Floor or Wall** — Minimum depth or thickness as necessary for required grade of fire separation but not less than 114 mm. Normal-density ($2400 \pm 50 \text{ kg/m}^3$) concrete. Maximum width of opening 127 mm.

• 2. **Firestop System Component** — (XHJZC). "FireMaster" ceramic fibre blanket, nominal 25 mm thick and 128 kg/m^3 density, compressed 40% minimum by folding and friction fitted into the opening. Minimum depth 89 mm installed flush with top of slab.

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

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Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHBN - Joint Systems

XHBN7 - Joint Systems Certified for Canada

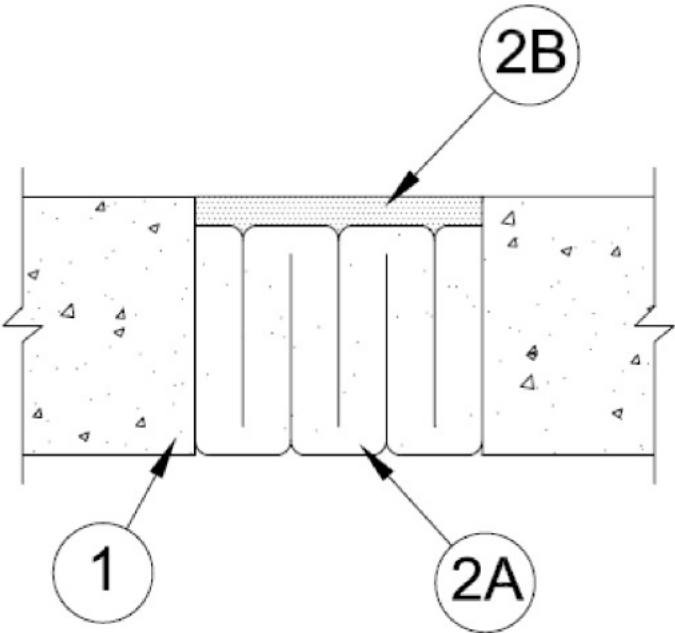
[See General Information for Joint Systems](#)

[See General Information for Joint Systems Certified for Canada](#)

System No. FF-S-1023

August 09, 2011

ANSI/UL2079	CAN/ULC S115
Assembly Rating — 3 Hr	F Rating — 3 Hr
Joint Width - 5 In. Maximum	FT Rating — 3 Hr
	FH Rating — 3 Hr
	FTH Rating — 3 Hr
	Joint Width - 5 In. Maximum



1. **Floor Assembly** — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) structural concrete.
2. **Joint System** — **Max width of joint is 5 in. (127 mm)** — The joint system shall consist of the following:
- A. **Fill, Void or Cavity Material* — Ceramic Blanket** — Min 4 in. (102 mm) thickness of min 6 pcf (96 kg/m³) ceramic fiber blanket insulation firmly packed into opening as a permanent form. Insulation cut and pleated to form a unit 4 in. (102 mm) deep and installed edge-first into joint opening such that sections of insulation unit are compressed a min 15 percent. Ceramic blanket to be recessed from top surface of the floor to accommodate the required thickness of mastic.
- THERMAL CERAMICS INC** — FireMaster Blanket, FireMaster 607 Blanket.
- B. **Fill, Void or Cavity Material* — Mastic** — A min 1/2 in. (13 mm) thickness of mastic fill material applied within the joint, flush with top surface of floor.
- THERMAL CERAMICS INC** — FireMaster Putty

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2011-08-09

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BKNV.R14229 - Batts and Blankets

Batts and Blankets

[See General Information for Batts and Blankets](#)

THERMAL CERAMICS INC
2102 OLD SAVANNAH RD
AUGUSTA, GA 30906-2133 USA
Ceramic fiber insulation with or without facings designated "Kaowool RT" or "Cerablanket" or "Superwool 607" or "Superwool Plus" formed into blankets.

R14229

Flame spread	0
Smoke developed	0

Unfaced blankets or foil faced also Classified in accordance with ASTM E136-93, "Standard Test Method for the Behavior of Materials in a vertical tube furnace at 750 C"

Ceramic fiber insulation and Alkaline earth silicate wool insulation designated "FireMaster 607 Blanket" formed into blankets.

Flame spread	0
Smoke developed	0

Unfaced blankets or foil faced also Classified in accordance with ASTM E136-93, "Standard Test Method for the Behavior of Materials in a vertical tube furnace at 750 C"

Ceramic fiber insulation designated "Thermal Ceramics PlenumWrap+", "FireMaster FastWrap XL", "Pyroscat Duct Wrap XL" and FireMaster FastWrap+ formed into blankets.

Flame spread	15
Smoke developed	10

Unfaced blankets or foil faced also Classified in accordance with ASTM E136-93, "Standard Test Method for the Behavior of Materials in a vertical tube furnace at 750 C"

[Last Updated](#) on 2018-04-26

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TEST SUMMARY

Objective

To test the specimen in accordance with AS1530.4, *Section 10 Service Penetrations and Control Joints*, to meet the requirements of AS 4072.1-2005 *Components for the protection of openings in fire-resistant separating elements. Part 1: Service penetrations and control joints*.

Test sponsor

Morgan Advanced Materials
30-36 Birralelee Road
Regency Park
South Australia
Australia 5010
Australia

Description of test specimen

The specimen consisted of seven control joints in a 120 mm thick concrete slab. Each joint was assembled from layers of 25 mm thick material which was compressed 10%. Five joints were made of Firemaster Expanding Felt, one of Firemaster Marine Plus Blanket and one of Superwool HT Unifelt. Five of the joints were backed with a 0.6 mm galvanized steel retaining plate, the remaining two were held in place with Thermgrip adhesive.

Date of test

27 February 2017

Test results

The test results in accordance with AS 1530.4 – 2014, *“Methods for fire tests on building materials, components and structures – Part 4: Fire – resistance test of elements of construction”* were as follows:



REPORT NUMBER:

FP5901

ISSUE DATE:

28 February 2017

PAGE:

2 of 28

GGH

A blue ink signature, likely belonging to GGH, inside a rectangular box.

ES

A blue ink signature, likely belonging to ES, inside a rectangular box.

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Specimen No.	Seal description	Control joint width	Results		
			Integrity	Insulation	FRL
A	4 x 25 mm Firemaster Expanding Felt with retaining plate	90 mm	240 NF	164	-/240/120
B	3 x 25 mm Firemaster Expanding Felt with retaining plate	67.5 mm	240 NF	192	-/240/180
C	2 x 25 mm Firemaster Expanding Felt with retaining plate	45 mm	240 NF	175	-/240/120
D	2 x 25 mm Firemaster Expanding Felt with no retaining plate	45 mm	240 NF	230	-/240/180
E	1 x 25 mm Firemaster Expanding Felt with no retaining plate	22.5 mm	240 NF	171	-/240/120
F	2 x 25 mm Firemaster Marine Plus Blanket with retaining plate	45 mm	240 NF	240 NF	-/240/240
G	2 x 25 mm Superwool HT Unifelt with retaining plate	45 mm	240 NF	238	-/240/180

The test standard requires the following statements to be included:



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1. TEST SPECIFICATION

AS 4072.1-2005 *Components for the protection of openings in fire-resistant separating elements Part 1: Service penetrations and control joints* section 3.1 Fire resistance testing, states that the fire resistance of the test specimen shall be determined by submitting one or more specimens to a fire resistance test in accordance with AS 1530.4.

The test was conducted in accordance with AS 1530.4-2014 “Methods for fire tests on building materials, components and structures, Part 4 Fire-resistance tests of elements of construction, Section 10: Service penetrations and control joints”, for which the fire resistance of the specimen is the time, expressed in minutes, to failure under one or more of the following criteria.

1.1 Integrity Failure Criteria

Failure shall be deemed to occur when;

- a) flames and/or hot gases cause flaming or glowing of the cotton fibre pad; or
- b) a 6 mm gap gauge can be passed through an unobstructed gap in the specimen and project into the furnace and move a distance of 150 mm along the gap, or
- c) a 25 mm gap gauge can be passed through an unobstructed gap in the specimen and project into the furnace, or
- d) Sustained flaming occurs on the surface of the unexposed face for 10 seconds or longer; or

1.2 Insulation Failure Criteria

Failure in relation to insulation shall be deemed to have occurred if;

- a) The maximum temperature at any point on the unexposed face of the penetration or element exceeds the initial temperature by 180 K.

2. DESCRIPTION OF TEST SPECIMEN

2.1 General

The test specimen consisted of seven control joints mounted within a 120 mm thick concrete floor slab. The slab was held together by a 50 mm x 50 mm x 4 mm steel angle section, 2,410 mm long, running down the full length of the slab on each side. The width of the gap depends on the specimen being tested and each control joint was exposed for at least 1,000 mm in length. All of the joint seals were positioned flush with the underside (exposed face) of the concrete slab. Figure 1 shows the test specimens layout.

All dimensions are nominal unless otherwise stated.



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2.2 Control joint construction

2.2.1 Joint A – 90 mm Firemaster Expanding Felt

The control joint seal consisted of four layers of 100 mm deep x 25 mm thick Firemaster Expanding Felt. Butt joints were staggered at 200 mm spacings about the centreline of the slab. The overall dimensions of the control joint seal were 100 mm x 100 mm prior to installation. Once installed within the concrete, the seal was compressed by 10% to give a 90 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through the steel angle section. A 0.6 mm thick galvanised steel plate was attached to the underside of the control joint using M6 Ramset™ Dynabolts™ 25 mm in from the edge of the seal. Four 7 mm diameter bolt holes were located 50 mm from each end, at 300 mm centres. At the other side of the control joint, 200 mm from each end and at 300 mm centres, were three slots 7 mm wide, extending 35 mm into the plate from the edge. A butt joint in the retaining plate was included 425 mm from one end.

2.2.2 Joint B – 67.5 mm Firemaster Expanding Felt

The control joint seal consisted of three layers of 100 mm deep x 25 mm thick Firemaster Expanding Felt. Butt joints were staggered at 200 mm spacings about the centreline of the slab. The overall dimensions of the control joint seal were 75 mm x 100 mm prior to installation. Once installed within the concrete, the seal was compressed by 10% to give a 67.5 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through the steel angle section. A 0.6 mm thick galvanised steel plate was attached to the underside of the control joint using M6 Ramset™ Dynabolts™ 25 mm in from the edge of the seal. Four 7 mm diameter bolt holes were located 50 mm from each end, at 300 mm centres. At the other side of the control joint, 200 mm from each end and at 300 mm centres, were three slots 7 mm wide, extending 35 mm into the plate from the edge. A butt joint in the retaining plate was included 425 mm from one end.

2.2.3 Joint C – 45 mm Firemaster Expanding Felt

The control joint seal consisted of two layers of 100 mm deep x 25 mm thick Firemaster Expanding Felt. Butt joints were located on the centreline of the slab and 200 mm from the centreline. The overall dimensions of the control joint seal were 50 mm x 100 mm prior to installation. Once installed within the concrete, the seal was compressed by 10% to give a 45 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through the steel angle section. A 0.6 mm thick galvanised steel plate was attached to the underside of the control joint using M6 Ramset™ Dynabolts™ 25 mm in from the edge of the seal. Four 7 mm diameter bolt holes were located 50 mm from each end, at 300 mm centres. At the other side of the control joint, 200 mm from each end and at



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300 mm centres, were three slots 7 mm wide, extending 35 mm into the plate from the edge. A butt joint in the retaining plate was included 425 mm from one end.

2.2.4 Joint D – 45 mm Firemaster Expanding Felt

The control joint seal consisted of two layers of 100 mm deep x 25 mm thick Firemaster Expanding Felt. Butt joints were staggered at 200 mm spacings about the centreline of the slab. The overall dimensions of the control joint seal were 50 mm x 100 mm prior to installation. Once installed within the concrete, the joint was compressed by 10% to give a 45 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through the steel angle section. Thermgrip adhesive was applied between the felt and the concrete on each side of the control joint. No retaining plate was fitted.

2.2.5 Joint E – 22.5 mm Firemaster Expanding Felt

The control joint seal consisted of a single layer of 100 mm deep x 25 mm thick Firemaster Expanding Felt. A butt joint was located at the centreline of the slab. The overall dimensions of the control joint seal were 25 mm x 100 mm prior to installation. Once installed within the concrete, the joint was compressed by 10% to give a 22.5 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through the steel angle section. Thermgrip adhesive was applied between the felt and the concrete on one side of the control joint. No retaining plate was fitted.

2.2.6 Joint F – 45 mm Firemaster Marine Plus Blanket

The control joint seal consisted of two layers of 100 mm deep x 25 mm thick Firemaster Marine Plus Blanket. Butt joints were located on the centreline of the slab and 200 mm from the centreline. The overall dimensions of the control joint seal were 50 mm x 100 mm prior to installation. Once installed within the concrete, the joint was compressed by 10% to give a 45 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through the steel angle section. A 0.6 mm thick galvanised steel plate was attached to the underside of the control joint using M6 Ramset™ Dynabolts™ 25 mm in from the edge of the seal. Four 7 mm diameter bolt holes were located 50 mm from each end, at 300 mm centres. At the other side of the control joint, 200 mm from each end and at 300 mm centres, were three slots 7 mm wide, extending 35 mm into the plate from the edge. A butt joint in the retaining plate was included 425 mm from one end.

2.2.7 Joint G – 45 mm Superwool HT Unifelt

The control joint seal consisted of two layers of 100 mm deep x 25 mm thick Superwool HT Unifelt. Butt joints were located on the centreline of the slab and 200 mm from the centreline. The overall dimensions of the control joint seal were 50 mm x 100 mm prior to installation. Once installed within the concrete, the joint was compressed by 10% to give a 45 mm wide control joint in the slab. The control joint seal was held in compression by an M8 Ramset™ Dynabolt™ in each side through



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the steel angle section. A 0.6 mm thick galvanised steel plate was attached to the underside of the control joint using M6 Ramset™ Dynabolts™ 25 mm in from the edge of the seal. Four 7 mm diameter bolt holes were located 50 mm from each end, at 300 mm centres. At the other side of the control joint, 200 mm from each end and at 300 mm centres, were three slots 7 mm wide, extending 35 mm into the plate from the edge. A butt joint in the retaining plate was included 425 mm from one end.

2.3 Floor slab

The floor slab consisted of a normal weight concrete slab nominally 120 mm thick, 1,200 mm wide, positioned on top of a concrete lined specimen holder with seven gaps each at least 1,000 mm long.

The density of the concrete at the time of testing was 2,119 kg/m³ and the moisture content at the time of test was 5.14%.



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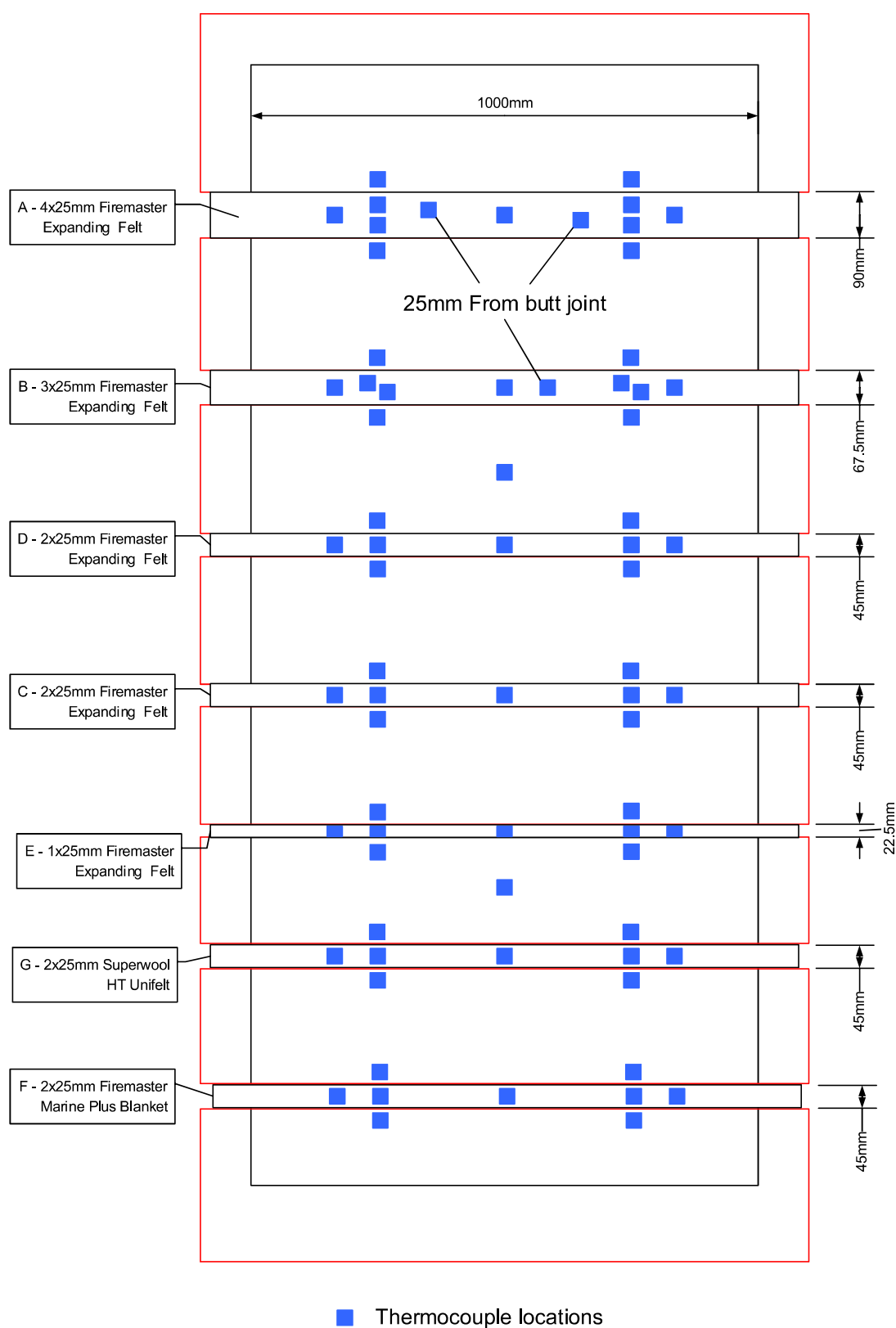
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Figure 1: Specimen layout



3.6 Insulation

Table 1 gives the location and time to Insulation failure of the control joints.

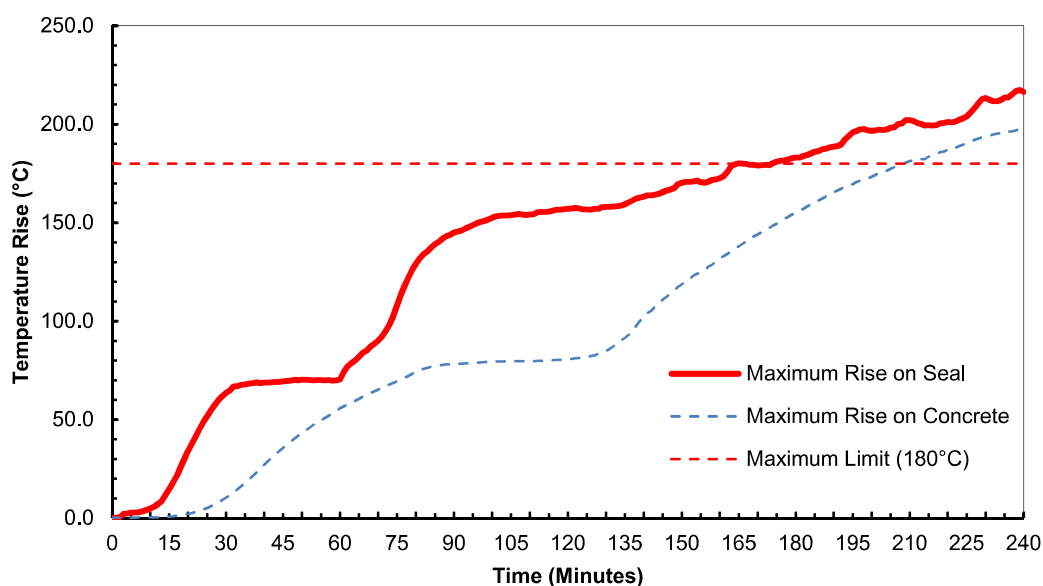
Table 1: Insulation failure and location

Specimen No.	Insulation failure location	Insulation (minutes)
A	On the seal 25mm from a butt joint in the middle of the specimen	164
B	On the seal 25mm from a butt joint in the middle of the specimen	192
C	On the centre of the seal	175
D	On the centre of the concrete	230
E	On the seal at 200 mm from the side of the specimen	171
F	NF	240
G	On the concrete panel 25 mm from the control joint	238

NF = No failure for the duration of the test

Graphs of the maximum temperature rise of the control joint and concrete panels are shown in Figure 5 to Figure 11 respectively.

Figure 5: Control Joint A - Maximum Temperature Rise



3.8 Integrity

Table 3 gives the Integrity performance of the control joints.

Table 3: Integrity failure and location

Specimen No.	Integrity failure location	Integrity (minutes)
A	NA	240NF
B	NA	240NF
C	NA	240NF
D	NA	240NF
E	NA	240NF
F	NA	240NF
G	NA	240NF

NF = No failure for the duration of the test

4. SUMMARY

The test results in accordance with AS 1530.4 – 2014, “*Methods for fire tests on building materials, components and structures – Part 4: Fire – resistance test of elements of construction*” were as follows:

Specimen No.	Seal description	Control joint width	Results		
			Integrity	Insulation	FRL
A	4 x 25 mm Firemaster Expanding Felt with retaining plate	90 mm	240 NF	164	-/240/120
B	3 x 25 mm Firemaster Expanding Felt with retaining plate	67.5 mm	240 NF	192	-/240/180
C	2 x 25 mm Firemaster Expanding Felt with retaining plate	45 mm	240 NF	175	-/240/120
D	2 x 25 mm Firemaster Expanding Felt with no retaining plate	45 mm	240 NF	230	-/240/180



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Specimen No.	Seal description	Control joint width	Integrity	Results	
				Insulation	FRL
E	1 x 25 mm Firemaster Expanding Felt with no retaining plate	22.5 mm	240 NF	171	-/240/120
F	2 x 25 mm Firemaster Marine Plus Blanket with retaining plate	45 mm	240 NF	240 NF	-/240/240
G	2 x 25 mm Superwool HT Unifelt with retaining plate	45 mm	240 NF	238	-/240/180

The test standard requires the following statements to be included:

“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.”

“This report details the methods of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in AS 1530.4. 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.”



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Photo 5: Retaining plate installation



Photo 6: Specimen at beginning of test



Photo 7: Specimen at 120 minutes



Photo 8: Specimen after 240 minutes



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