THE**PASSIVE FIRE PROTECTION**SPECIALISTS

Our Credentials :

Quality Management System ISO 9001-2008

ISO 14001 Registered
OHSAS 18001 Registered

Licensee of Cafco Asia Pacific
(A Division of Promat (Malaysia) Sdn. Bhd.)

UL follow-up service inspection

PSB Listed Class 1A & 2 and Quality Audit

CAFCO Fendolite MII: 022-109-2365
CAFCO Mandolite CP2: 022 - 109 - 2366

WSHC – BizSafe Level STAR

Building and Construction Authority
Registered Contractor: BCA ID 87.1.9
(CR01/CR02/CR09)

Cafco Mandolite CP2

Vermiculite Cementitious Fireproofing Products

Construction

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Introduction

Cafco Mandolite CP2 is a spray applied, single package factory controlled premix, based on vermiculite and Portland cement, for internal use.

Cafco Mandolite CP2 produces a monolithic coating able to withstand the thermal shocks experienced in a high intensity cellulosic fire. Concrete structures in particular, will be protected from explosive spalling when coated with **Cafco Mandolite CP2**.

Although low in density, thus significantly reducing dead load, **Cafco Mandolite CP2** is highly durable and will not crack or spall under mechanical impact.

Cafco Mandolite CP2 may be applied within environments where limited exposure to the elements is likely throughout the building phase of the project, eg perimeter beams.

Cafco Mandolite CP2 does not release toxic or hazardous fumes, and presents no known health hazards either before, during or after application.

Cafco Mandolite CP2 is used for application on steel and concrete frames, metal floor or roof decks, and return air plenums. It may be easily removed and reinstated locally when additional fixings are required.

Building types that will benefit from the use of **Cafco Mandolite CP2** include a wide range of educational, leisure and entertainment centres, or commercial or industrial projects.

Properties & Performance

Truss & Tie Beam Connection

On Site Use

For interior and limited exterior exposure (during construction)

Colour and Finish

Off-white, with a monolithic spray texture.

Minimumm Partical Thickness

8mm when unreinforced. 15mm when reinforced.

Theoretical Coverage

172m^2/tonne at 15mm thickness.

Number of Coats

One or more, as required.

Cure

By hydraulic set.

Initial Set

2 to 6 hours at 20˚C and 50% RH

Density

390kg/m^3 ± 15% (when dry and in place)

Air Erosion Resistance (ASTM E859)

No erosion

Bond Impact (ASTM E760)

No cracks or delaminations

Deflection Effect (ASTM E759)

No cracks or delaminations within normal code limits.

Compressive Strength (ASTM E761)

563kPa (81.61b/in^2)

Cohesion / Adhesion

(ASTM D736-2000)

Combustibility

Non-combustible to BS 476: Part 4.

Flame Spread (ASTM E84)

Class 0 as defined by the Building Regulations.

Smoke Generation (ASTM E84)

Does not contribute to smoke generation.

Thermal Conductivity

0.095W/mK at 20˚C.

pH Value

12.0 – 12.5.

Properties & Performance (cont.)

Beam & Truss

Corrosion Resistance

Does not promote corrosion of steel. However, a primed substrate is recommended for long term corrosion resistance. See 'Preparation'.

Fire Resistance

Structures protected with **Cafco Mandolite CP2** have undergone fire resistance tests up to 240 minutes in approved independent laboratories to recognized standards in the following countries:

UK (to BS 476: Parts 20-24: 1987)

USA (to ASTM E119 UL 263)

The tests also comply with International Standard ISO 834.

Cafco Mandolite CP2 protected structures have been successfully tested under BS 476: Part 21: 1987 to failure temperatures of up to 800˚C.

This allows the specifier the freedom to adopt a fire engineering approach to fire resistance in accordance with BS 5950: Parts 3 and 8: 1990, as well as the Fire Appendices of the forthcoming Eurocode.

The fire resisitance test results relate soley to the construction tested and test conditions imposed.

Cafco Asia Pacific provides computer based thickness calculations to meet specific fire ratings on receipt of details. See 'Fire protection thickness'.

Fire Protection Thickness

Establishing the Correct Thickness

The thickness of the fire protection for a given period of fire resistance in a cellulosic type fire, relates to the Hp/A ration of the section. Hp/A is the ratio of the heated perimeter exposed to fire to the cross-sectional area of steel.

All column and beam sections have their own specific Hp/A ratio. Refer to the 'Technical Introduction' to establish the Hp/A ratio for a particular beam or column section, or contact Prostar. Then use Tables 1 and 2 on opposite page to ascertain the thickness of **Cafco Mandolite CP2** that meets the required period of fire resistance for 1 section beams and H section columns.

For advice on thickness calculations for hollow sections, castellated sections, composite floors, upgrading of concrete slabs and more complex situations, please contact Prostar.

Fire Protection Thickness (cont.)

Establishing the Correct Thickness

Table 1: Cafco Mandolite CP2 thickness for 1 section beams (3 sided exposure). Critical temperature 620°C, continuous concrete topping.

Mandolite CP2 thickness (mm) for fire resistance of:						
Hp/A	30 (mins)	60 (mins)	90 (mins)	120 (mins)	180 (mins)	240 (mins)
30	8	8	9	11	16	21
50	8	8	12	15	22	28
70	8	10	14	18	26	34
90	8	11	16	20	29	38
110	8	12	17	22	31	41
130	8	13	18	23	33	43
150	8	13	19	24	35	45
170	8	14	19	25	36	47
190	8	14	20	26	37	48
210	9	15	20	26	38	49
230	9	15	21	27	39	51
250	9	15	21	27	39	51
270	9	15	21	28	40	52
290	9	16	22	28	40	53
310	9	16	22	28	41	54

Table 2: Cafco Mandolite CP2 thickness for 1 section beams and H section columns (4 sided exposure). Critical temperature 550°C.

Mandolite CP2 thickness (mm) for fire resistance of:						
Hp/A	30 (mins)	60 (mins)	90 (mins)	120 (mins)	180 (mins)	240 (mins)
30	8	8	10	13	19	24
50	8	10	14	18	25	33
70	8	12	16	21	30	38
90	8	13	18	23	33	43
110	9	14	19	25	35	46
130	9	15	20	26	37	48
150	10	15	21	27	38	50
170	10	16	22	28	40	52
190	10	16	22	28	41	53
210	10	17	23	29	42	54
230	10	17	23	30	42	55
250	11	17	24	30	43	56
270	11	17	24	30	44	57
290	11	18	24	31	44	57
310	11	18	24	31	45	58

Note *: UK maximum steel temperature are normally accepted at 550 ˚C (for columns) and 620 ˚C (for 3 sided beams) for fully loaded steel members.*

Preparation

Typical Substrates

Unprimed and primed steel, concrete frames, metal floor/roof decks, and return air plenums.

Substrate Preparation

The substrate shall be clean, dry and free from dust, loose millscale, loose rust, oil and any other condition preventing good adhesion.

Cafco Mandolite CP2 can be applied to unprimed and primed steelwork.

Prior to the application of **Cafco Mandolite CP2**, incompatible primers should be prepared by the application of SBR Bonding Latex used as a keycoat.

Mesh Reinforcement

Most fire tests conducted have been carried out without mesh reinforcement, to demonstrate the ability of **Cafco Mandolite CP2** to stay in place under the most severe fire conditions. However, for maximum long term in-service durability, the use of lightweight mesh reinforcement is recommended for exterior work and for interior use where vibration or mechanical damage and the possibility of subsequent de-bonding exit.

Application

Roof Truss

Initial Steps

Application of **Cafco Mandolite CP2** must be carried out by an applicator recognized by Cafco Asia Pacific [A Division of Promat (Malaysia) Sdn. Bhd.] and applied in accordance with the Installation Guide available from Cafco Asia Pacific.

Methods

Mix **Cafco Mandolite CP2** with potable water in a suitable mixer and apply by a spraying machine approved by Cafco Asia Pacific.

Cafco Mandolite CP2 may be centrally pumped vertically or horizontally, enabling all spray plant and material storage to be contained in one area.

Limitations

Cafco Mandolite CP2 may be applied when the substrate and air temperatures are at least 2˚C and rising, but should not be applied if the substrate or air temperatures are less than 4˚C and falling. Maximum air and substrate temperature is 45˚C.

Substrate temperature should be at least 2˚C above dewpoint temperature.

Topcoating

General Considerations

Topcoat may be used as protection from frequent wash down, long term chemical spills, or for improved resistance to fungal, algal and bacterial growth.

Packaging, Storage, Shelf Life

Packaging

Approximate 12.5kg bags.

Storage

Off the ground and kept dry until ready for use.

Shelf Life

12 months maximum.

Environmental

- Not readily biodegradable.
- Not expected to bioaccumulate.
- Not expected be toxic to aquatic life except at high concentrations.
- Do not discharge into drains and watercourses.

Health and Safety

Cafco Asia Pacific's activities are conducted with due regard to all statutory requirements with appropriate safeguards against exposing employees and the public to health and safety risks.

A full copy of Cafco Asia Pacific's Health, Safety and Environment Policy document is available on request.

See Safety Data Sheets (including COSHH Regulations) Code Reference Saf-7.

Quality Assurance

Cafco Asia Pacific operates a quality system in accordance with BS EN ISO 9002: 1994, and has received full accreditation by BSI to these standards.

Operating to these standards means that all activities, which have a bearing upon quality, are set out in written procedures. Systematic and thorough checks are made on all materials and their usage. Test equipment is subjected to regular checks and is referred back to national standards.

The information given in this data sheet is based on actual tests and is believed to be typical of the product. No guarantee of results is implied however, since conditions of use are beyond our control.

Further Information

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