



## Construction

### Mandolite CP2

### Data Sheet C/F/C-8

#### Usewith:

SBR Bonding Latex	See Data sheet C/F/A-5
SC 125	See Data sheet C/F/A-6
Topcoat 200	See Data sheet C/F/T-5
Mesh Fixings	See Data sheet C/F/R-2
Plastic Coated Galv. Mesh	See Data sheet C/F/R-3

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

*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 Mandolite CP2.*

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

*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.*

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

*Mandolite CP2 is used for application to 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 Mandolite CP2, include a wide range of educational, leisure and entertainment centres, commercial or industrial projects.*



The steel frame at the Churchill Plaza, Basingstoke is protected with Mandolite CP2.

#### Properties and performance

**Colour and finish**

Off-white, with a monolithic spray texture.

**Minimum practical thickness**

8mm when unreinforced. 15mm when reinforced.

**Theoretical coverage**

172m<sup>2</sup>/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<sup>3</sup> ± 15% (when dry and in place).

## Properties and performance (cont)

Air erosion resistance	No erosion to ASTM E859.
Bond impact	No cracks or delaminations.
Deflection effect	No cracks or delaminations within normal code limits.
Compressive strength	563kPa (81.6lb/in <sup>2</sup> ) to ASTM E761.
Combustibility	Non-combustible to BS 476: Part 4.
Flame spread	Class 0 as defined by the Building Regulations.
Smoke generation	Does not contribute to smoke generation.
Thermal conductivity	0.095W/mK at 20°C.
Corrosion resistance	Does not promote corrosion of steel. However, a primed substrate is recommended for long term corrosion resistance. See 'Preparation'.
ph value	12.0 - 12.5.
Fire resistance	<p>Structures protected with Mandolite CP2 have undergone fire resistance tests up to 240 minutes in approved independent laboratories to recognised standards in the following countries: UK (to BS 476: Parts 20-24: 1987) Germany (to DIN 4102) USA (to ASTM E119 UL 263)</p> <p>The tests also comply with International Standard ISO 834.</p> <p>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.</p> <p>The fire resistance test results relate solely to the constructions tested and test conditions imposed.</p> <p>Cafco International provides computer based thickness calculations to meet specific fire ratings on receipt of details. See 'Fire protection thickness'.</p>

## 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  $H_p/A$  ratio of the section.  $H_p/A$  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  $H_p/A$  ratio. Refer to the 'Technical Introduction' to establish the  $H_p/A$  ratio for a particular beam or column section, or contact Cafco International. The use Table 1 and 2 on opposite page to ascertain the thickness of Mandolite CP2 that meets the required period of fire resistance for I section beams and H section columns.

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

## Fire protection thickness (cont)

### Establishing the correct thickness

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

Hp/A	Mandolite CP2 thickness (mm) for fire resistance of:					
	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:** Mandolite CP2 thicknesses for I section beams and H section columns (4 sided exposure). Critical temperature 550°C.

Hp/A	Mandolite CP2 thickness (mm) for fire resistance of:					
	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 temperatures 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. Mandolite CP2 can be applied to unprimed and primed steelwork.

Prior to the application of Mandolite CP2, incompatible primers should be prepared by the application of **SC125** or **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 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 where vibration or mechanical damage and the possibility of subsequent de-bonding exist.

## Application

### Initial steps

Application of Mandolite CP2 must be carried out by an applicator recognised by Cafco International and applied in accordance with the Installation Guide available from Cafco International.

### Methods

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

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

### Limitations

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 200** 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

12.5kg bags.

### Storage

Off the ground and kept dry until ready for use.

### Shelf life

12 months maximum.

## Environment

Not readily biodegradable.

Not expected to bioaccumulate.

Not expected to be toxic to aquatic life except at high concentrations.

Do not discharge into drains or watercourses.

## Health and safety

Cafco International'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 International's Health, Safety and Environment Policy document is available on request.

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

## Quality assurance

Cafco International operates a quality system in accordance with BS EN ISO 9001: 2000, 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



Bluebell Close  
Clover Nook Industrial Park  
Alfreton  
Derbyshire DE55 4RA. UK  
Tel: +44 (0) 1773 837 900  
Fax +44 (0) 1773 836 710

P.O. Box 33725  
Sharjah  
United Arab Emirates  
Tel: +971 6 558 3448  
Fax: +971 6 558 2475

3 Rue de L'Industrie, L-3895 Foetz  
G.D. Luxembourg  
Tel: +352 55 17 17  
Fax +352 55 27 99

13, rue Champeau - ZAE Capnord  
F-21850 St Apollinaire  
France  
Tel: +33 3 80 7887 30  
Fax: +33 3 80 7341 26

Email: [info@cafcointl.com](mailto:info@cafcointl.com) Website: [www.cafcointl.com](http://www.cafcointl.com)