

Introduction

Cafco MANDOLITE® HS3 is a cement / vermiculite spray system that can provide up to 240 minutes fire protection to structural steel sections to internal, or fully external applications. (For external applications a suitable topcoat system must be applied).

Cafco MANDOLITE® HS3 can be applied directly on to clean bare 'ginger' steel or clean oil-free galvanised steel for internal use.

All other conditions will require some form of preparation. This may simply require degreasing, de-scaling or the removal of loose rust to restore the surface condition to those above, but all other situations will require consideration to be given in preparing the steel surface before Cafco MANDOLITE® HS3 can be applied.

If the steel is in an external application it must be primed using a suitable primer to provide long term corrosion protection. It is however, for the building designer to decide whether the risk of corrosion in an internal environment warrants the use of a priming system.

Promat Cafco sprayed products are only applied by Promat CRA Contractors, who are trained in the mixing and spray application techniques required for this particular product.

The most important factor for the contractor to consider is the compatibility of the spray product with the surface it is being applied to – it must stick to it and stay there.

It is therefore the Promat CRA Contractor's responsibility to ensure that the substrate to be protected is in a suitable condition to accept the coating and that any primer used is fully cured.

Primer Compatibility

Cafco MANDOLITE® HS3 must only be applied onto primers that are in good condition.

The primer must be clean, dry and free from dust, oil or any other contaminant that may inhibit good adhesion.

In refurbishment situations, where spray products may require to be applied over old, or existing primed and painted steelwork (that may be in an unsound or poor condition); the paint types will need to be clearly identified and established as being *compatible* or *incompatible* with Cafco MANDOLITE® HS3, before any attempt is made to apply the spray coating.

Existing paints may even require to be removed if they are of a type that can have an adverse reaction, or that may cause adhesion problems with the Cafco MANDOLITE® HS3 spray coating.

If the primer used cannot be clearly identified from this technical note, or there is still doubt about the primer compatibility, then a technical data sheet for the primer should be forwarded to Promat Technical Services Department for clarification, before any application work is carried out.

Any damage to the primer must also be repaired, and the primer applied in accordance with the manufacturer's guidance

- For *compatible* primers (with the *exception* of vibration or movement allowance requirements) – Cafco MANDOLITE® HS3 is **always** applied onto a KEYCOAT to achieve correct adhesion. The KEYCOAT is a specific mix of diluted CAFCO® SBR Bonding Latex, with Cafco MANDOLITE® HS3 for this particular application.
- For *incompatible* primers – Cafco MANDOLITE® HS3 is **always** applied onto CAFCO® SC125 which provides a sealer coat to form a barrier to the incompatible paint, and bonding surface for the Cafco MANDOLITE® HS3.
- Where there is a requirement for *vibration or movement allowance*, MANDOLITE® HS3 is **always** applied onto CAFCO® SC125 *even if* the primer is of a compatible type such as a Two-pack Epoxy Resin

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Application to Polyurethane (PU), to any other Topcoat - or to any Glossy Primer

Structural steel sections can be shipped and delivered to site with a primer coat, intermediate coat and a topcoat system already applied, so that the steels are corrosion resistant prior to transportation and are already aesthetically acceptable to the client.

On these rare occasions, when Polyurethane (PU) or another topcoat are found to have been applied, the topcoat should ideally be completely removed by sweep blasting taking care to only remove the topcoat paint, and not the primer paint layers beneath it.

As an alternative to sweep blasting, the Polyurethane or other topcoat surface (or even a glossy primer) must be thoroughly mechanically abraded over the entire surface, using power sanding tools so that the shiny gloss finish of the paint is removed.

(In cases where Intumescent Fire Resistant Paint Coatings may have been applied, then the coating *must be completely removed* back to bare metal if Cafco MANDOLITE® HS3 is to be subsequently used.)

Application to Compatible Primers

Compatible primer types must be stable when exposed to the alkaline pH of 12-12.5 of the Portland cement contained in the Cafco MANDOLITE® HS3.

Compatible primers are:

- **Two-pack Epoxy Resins**
- **Epoxy MIO** (Micaceous Iron Oxide)

Note: This does **not** include *Alkyd MIO* types, as they are **not** compatible.

- **Zinc-Rich Epoxy**

Note: If Zinc-Rich Epoxy primers are left exposed for long periods, zinc salts may form on the surface of the primer. Steels should be rinsed with clean water and scrubbed if necessary, to remove any salts, and then allowed to dry before applying the KEYCOAT and Cafco MANDOLITE® HS3 in the normal manner

- **Zinc Silicate primers - *caution see note below***

Note: *Organic/Inorganic Zinc Silicate primers are a special case.* They are porous and, in our opinion, are **not directly** compatible Cafco MANDOLITE® HS3. In order to apply Cafco MANDOLITE® HS3 to surfaces primed with this material, it is essential that the zinc silicate primer is cleaned with clean fresh water (if required to remove zinc salts) and when dry, a 25-30 micron tie coat/mist coat of an Epoxy primer, applied and cured in accordance with the manufacturer's recommendations. Once the tie coat is cured, this may be treated as a *compatible* substrate, by applying the KEYCOAT and Cafco MANDOLITE® HS3 in the normal manner.

Spray Application of Cafco MANDOLITE® HS3 onto Compatible Primers.

For application of Cafco MANDOLITE® HS3 onto *compatible* primers, a KEYCOAT is *always* required to achieve correct adhesion. The KEYCOAT (sprayed at 20-50% coverage as a 'spatter coat'), and must be allowed to cure for 10-36 hours - dependant on drying conditions, before spray applying the Cafco MANDOLITE® HS3.

Cafco MANDOLITE® HS3 must be applied in the minimum number of built-up layers to achieve the final coating protection thickness. Layers must be allowed to dry for 2-6 hours between coats.

Full details of the KEYCOAT are given in the Cafco MANDOLITE® CP2 Application Manual.

Note: The KEYCOAT is a specific mix of diluted CAFCO® SBR Bonding Latex, with Cafco MANDOLITE® HS3 for this particular application.

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Application to Incompatible Primers

Incompatible primer types are those that are alkali sensitive and can therefore react with the high alkalinity of Cafco MANDOLITE® HS3, for example, those containing an *Alkyd* binder.

Incompatible primers are:

- **Single-pack Alkyds**
- **Single-pack Alkali Sensitive Alkyds**
- **Single-pack Oil Based**
- **Red Oxide primers**
- **Alkyd MIO** (Micaceous Iron Oxide).

Notes:

Single-pack oil based / Single-pack alkali sensitive alkyds

Saponification is a chemical reaction that can occur between Single pack Alkyd, or Oil Based primers and the high alkalinity of Cafco MANDOLITE® HS3. This can take up to three months to become evident, and is usually characterised by a regular vertical cracking pattern in the web, or horizontal cracking on the flange tips (particularly on the bottom flange). This reaction results in bond loss and detachment of the Cafco MANDOLITE® HS3 from the surface, which can be identified by a hollow ringing sound when the Cafco MANDOLITE® HS3 is tapped with a tool handle.

Red Oxide primers

Red Oxide primers have no alkali resistance, and they are therefore not compatible with the high alkalinity of Cafco MANDOLITE® HS3.

Spray Application of Cafco MANDOLITE® HS3 onto Incompatible Primers.

For the application of Cafco MANDOLITE® HS3 onto an *incompatible* primer, a barrier coat of CAFCO® SC125 is required to provide a complete alkali resistant barrier and act as a bonding coat for the Cafco MANDOLITE® HS3.

CAFCO® SC125 is a yellow coloured water-based synthetic latex. In addition to CAFCO® SC125 forming a barrier to incompatible paints, the 'rubber-like' coating also ensures correct adhesion of the Cafco MANDOLITE® HS3, and can also be used on any primed beam where there is a requirement for vibration or movement allowance.

- After the CAFCO® SC125 coat has been applied, the Cafco MANDOLITE® HS3 must be applied within 2 months, or the surface must be washed and CAFCO® SC125 re-applied.
- CAFCO® SC125 must never be used as a primer onto bare steel.
- CAFCO® SC125 must never be allowed to freeze during storage or transportation. Frozen material must be rejected and removed from site.

Full details of the barrier coat are given in the Cafco MANDOLITE® CP2 Application Manual

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