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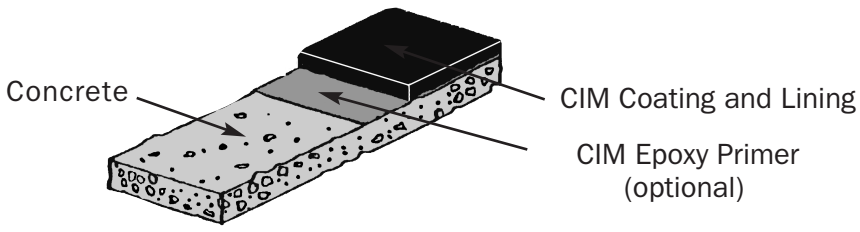
# Instruction Guide
# APPLICATION OF CIM TO CONCRETE

## 1.0 DESCRIPTION
This guide covers the installation of a CIM coatings and linings (CIM) over a structurally sound concrete base such as a deck, roof or tank. The CIM shall consist of a minimum of 55 dry mils (see CIM Technical Data Sheet and appropriate coverage chart) applied by spray, squeegee, roller, or trowel. Actual coverage rates may differ from theoretical rates depending on surface profile and application method.

## 2.0 MATERIALS
**2.1 CIM Premix & Activator**
**2.2 Optional Materials**
**2.2a. CIM Epoxy Primer**
**2.2b. CIM Bonding Agent**
**2.2c. CIM Scrim**
**2.2d. CIM 1000 Trowel Grade Premix & Activator**

## 3.0 SAFE PRACTICES
Use equipment and procedures designed to minimize danger to personnel and materials. Special attention should be made to provide adequate ventilation and respirators for personnel applying CIM in confined spaces or operating spray equipment. See C.I.M. Industries' Instruction Guides, "Applying CIM Within Confined Spaces" (IG–9) and "Spray Application of CIM" (IG-12) for more detailed information.

## 4.0 SURFACE PREPARATION
All areas adjacent to those being coated with CIM which are not intended to be coated should be protected with suitable temporary splash covers such as polyethylene, carpenters paper, or masking tape. CIM shall be applied to clean, dry, structurally sound concrete.[1] Concrete shall only be coated while the concrete is in a temperature declining mode (usually late afternoon). CIM Epoxy Primer may be used to minimize outgassing.




**Notes:**

[1]If surfaces are not completely clean, CIM will achieve poor adhesion to the concrete and may experience blistering and possible failure.

**NOTES:**

**CONCRETE SHOULD NOT BE COATED WHILE IN DIRECT SUNLIGHT!**
Concrete should be coated only while in a temperature declining mode. CIM, because it is black, is a solar absorber and can increase the surface temperature of the concrete by as much as 90°F. This, in turn, heats up the air trapped within the concrete's pores. The air expands and tries to push its way out of the concrete, creating hundreds of bubbles, otherwise known as outgassing. Therefore, if concrete is coated in direct sunlight (e.g. a temperature rising mode), outgassing will generally occur.

### 4.1 New Concrete

New concrete must have a minimum compressive strength of 3,000 psi, be dry, and be free of release agents or curing compounds prior to the application of CIM. CIM may be applied directly to concrete laitance but good adhesion is unlikely. Due to the poor tensile properties of concrete laitance, it is recommended to remove the concrete laitance and expose the tops of the underlying aggregate. This condition is typically represented by an ICRI Concrete Surface Profile of 4 to 6 to expose aggregate. In order to properly prepare the concrete, and remove any release agents or curing compounds, any one of the following can be performed:

1. Abrasive blasting (ASTM D 4259-88)
2. Water blasting (ASTM D 4259-88) (generally at 5,000 psi minimum), allow concrete to dry
3. Shot blast (ASTM D 4259-88), horizontal surfaces

### 4.2 Old Concrete

Old concrete must be clean and dry, and free of oil, grease and loose powder or debris. It is highly recommended to remove the existing concrete laitance on the surface and expose the tops of the underlying aggregate. This condition is typically represented by an ICRI Concrete Surface Profile of 4 to 6. In order to properly prepare the concrete, and remove contaminants, any one of the following can be performed:

1. Abrasive blasting (ASTM D 4259-88)
2. Water blasting (ASTM D 4259-88) (generally at 5,000 psi minimum), allow concrete to dry
3. Shot blast (ASTM D 4259-88), horizontal surfaces

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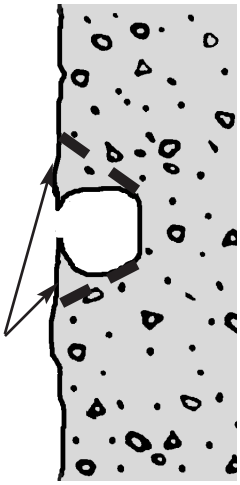
### 4.3 Bugholes

Bugholes appear as small holes in concrete. These holes often lead to larger holes under the surface of the concrete (see Figure 2). It is important to blast all concrete surfaces where bugholes are present to expose the full view of the hole (no "blind" side surfaces). Bugholes should be filled with appropriate repair materials and may require an abrasive blast to remove any loose powder or debris.

**Figure 2**




### 4.4 Testing for Moisture

Although concrete may appear to be dry on the surface, there is often an abundance of moisture below the surface. An abundance of moisture in the concrete during application will result in poor adhesion and eventually blisters in the coating. Consistent with industry standards, C.I.M. Industries recommends performing two or more of the following tests to confirm appropriate moisture levels for properly prepared substrates:

| | |
|---|---|
| 1. Plastic Sheet method (ASTM D4263) | Pass/Fail |
| 2. Relative Humidity test (ASTM F2170-09) | <85% |
| 3. Calcium Chloride test | <5 lb/1,000 sq ft per 24 hr |
| 4. Radio Frequency test | < 5 % moisture |

(as outlined in "Drying Concrete" by Lew Harriman in the March 1995 issue of *The Construction Specifier* Magazine)

## 5.0 APPLICATION

### 5.1 Cracks in Concrete (all applications)

Cracks less than $^{1}/_{16}$" wide typically do not require special treatment. All cracks $^{1}/_{16}$"to $^{1}/_{8}$" wide shall be stripe coated and filled with CIM prior to the application of the CIM. Vertical and sloped walls require the use

**NOTES:**

of CIM 1000 Trowel Grade to fill cracks. If cracks are more than ⅛" wide or experience movement, refer to manufacturer for patch/fill details. Proper joint design shall be used. CIM Scrim may be used to reinforce cracks and joints. See section 5.4 for further details.

**5.2 Penetrations**

Penetrations must be coated with CIM 1000 Trowel Grade at all horizontal to vertical transitions. CIM 1000 Trowel Grade should be applied at least 60 wet mils thick, 2" onto and 2" beyond the penetration. Please see section 5.8 for application procedures for multiple coats. If work stoppage is unavoidable see sections 5.9 and 5.10.

CIM will adhere to most clean construction materials. When coating substrates other than concrete, please see the C.I.M. Industries' specific substrate Instruction Guide for detailed information of application procedures.

**5.3 Sharp Edges**

CIM 1000 Trowel Grade may be used on sharp edges to prevent thin spots from occurring. The entire area should be coated with the specified thickness of CIM coating within 4 hours after troweling sharp edges. Do not allow CIM 1000 Trowel Grade to cure more than four (4) hours at 70°F before coating with additional applications of CIM. If work stoppage is unavoidable see sections 5.9 and 5.10.

**5.4 Using CIM Scrim**

CIM Scrim may also be used on sharp edges to prevent thin spots from occurring. After the substrate is properly prepared apply a thin tack coat, 10–20 mils, of CIM. Push scrim evenly into tack coat and allow to cure for 1–4 hours (1–2 hours for CIM 500 and 500V). Apply 60 wet mils of CIM directly over scrim. CIM Scrim acts as a coverage gauge to insure thickness.

**5.5 Cant Strips**

Cant strips should be made with CIM 1000 Trowel Grade wherever horizontal surfaces meet vertical surfaces. This is crucial in applications such as tanks which experience wall movement when filled, and where concrete shifts due to expansion and contraction. Cant strips are generally ½" or more wide by ½" or more tall. Allow the cant to cure for a minimum of 12 hours at 70°F. Contact C.I.M. Industries for specific design details.

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**5.6 Horizontal Surfaces**
CIM should be applied to concrete at a film thickness of 60 wet mils, depending on application type. This can be achieved in a single coat on horizontal surfaces.

**5.7 Vertical and Sloped Surfaces**
CIM can be applied to a vertical or sloped surface with a roller, brush or spray equipment. Small walls are often coated with rollers or brushes. Large walls should be sprayed using an air assisted airless spray system or plural component spray system. See C.I.M. Industries' Instruction Guide, "Spray Application of CIM" (IG–12) or contact C.I.M. Industries for suggested equipment configuration. When working with CIM products other than 500V, vertical or sloped surfaces require a minimum of two (2) applications of approximately 30 mils each to obtain the required thickness. CIM 500V can be applied to vertical surfaces in one application of 60 mils. If a coating thickness of more than approximately 60 wet mils is specified on a vertical or sloped surface, additional coats will be required to achieve desired thickness.

**5.8 Multiple Coats**
Second/multiple coats can be applied as soon as the previous coat can be touched lightly without coming off on your finger. For CIM at 70°F, the tack free time is typically one hour but no longer than four hours after the previous coat has been applied. When using CIM 500 and 500V tack free time is typically one hour but no longer than two to three hours after the previous coat has been applied. Higher temperatures speed up the curing time, and tack free time, therefore significantly shortening the recoat window. Colder temperatures have the opposite effect. As soon as the coating becomes tack free, the second coat should be applied. For immersion or traffic service, apply all coats within the recoat window, except at joint lines

If it is necessary to walk on the first coat of CIM in order to apply multiple coats, such as when coating a parking or pedestrian deck, polyethylene boots may be worn to prevent sticking to the coating.

**5.9 Recoating After the Recoat Window**
If second/multiple coats cannot be applied within the recoat window, the previous coat must be abraded. Abrading shall be performed by surface grinder or other mechanical means. The CIM

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must be solvent wiped (MEK or xylene) to clean up any loose debris. After the solvent flashes off, a light mist of CIM Bonding Agent must be applied. Allow the Bonding Agent to flash off and recoat within one (1) hour. See CIM Bonding Agent Technical Data.

Sheet for additional guidelines. For immersion or traffic service, minimize areas to be recoated outside the recoat window, severely abrade the areas to be recoated and test recoated areas for acceptable adhesion. Acceptable adhesion may only be achieved through aggressive abrading.

**5.10 Overlap at Joints**

Should rain or other conditions require work stoppage, prepare for joint lines. Joint lines shall be clean and straight. The overlap shall be a minimum of 6" to insure an impervious joint. All areas to be coated where the recoat window has been missed shall be treated per section 5.9, "Recoating After the Recoat Window."

## 6.0 TOPPINGS

The CIM may include toppings of aggregate, decorative coatings, protective coatings, or combinations of the above. See C.I.M. Industries' Instruction Guide, "Topcoats" (IG–7) for more detailed information.

## 7.0 GENERAL LIMITATIONS

Applying CIM under any of the following conditions is likely to result in poor or unsatisfactory performance:

- Use of improper mixing equipment. See C.I.M. Industries' Instruction Guide "Mixing CIM Premix and Activator" (IG–8).
- Material temperature at the time of application is below 60°F.
- Use of standard application procedures when substrate temperature is below 50°F. See C.I.M. Industries' Instruction Guide "Applying CIM Coatings in Cold Weather" (IG–11).
- Substrate moisture is present or rain is imminent.
- Substrate temperature is less than 5°F above the dew point.
- Substrate is in a temperature-rising mode or exposed to direct sunlight.
- Other conditions which are obviously unsuitable.
- CIM 500 is not UV stable and should not be left exposed to UV for longer than 180 days. CIM 500 is not designed for immersion applications.
- CIM 500 and 500V have a shorter recoat window than other CIM products. Depending on site conditions the recoat window is typically no longer than 2 to 3 hours.