

# SPECIFICATION AND INSTALLATION OF COLD FLUID-APPLIED COATINGS FOR PEDESTRIAN TRAFFIC

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There are many factors that must be considered and addressed to achieve a successful application of a cold fluid-applied pedestrian traffic coating. To achieve a successful application, a suitable product must be specified, along with appropriate detailing, and the product installation must comply with the project and manufacturer requirements.

## PRODUCT SELECTION

To select an appropriate product, it is helpful to begin by identifying the specific objectives and constraints for the particular pedestrian traffic coating project. Once all the project objectives and constraints have been clearly identified, a pedestrian traffic coating can be selected that best meets the project requirements.

The following are some typical objectives, constraints, and questions to consider:

**1. Waterproofing:** Does the traffic

coating need to serve as a waterproof barrier? Although pedestrian traffic coatings are most often installed for the functional purpose of waterproofing and protecting a substrate, sometimes a coating may be installed strictly for aesthetic reasons.

- 2. Chemical Resistance:** What chemicals may the coating be exposed to, and does the specified product have testing to confirm appropriate resistance?
- 3. Substrates:** What substrates will the coating be applied to? Can the coating achieve adhesion to the intended substrates? What surface preparation is necessary? Is a primer needed?
- 4. Service Temperature:** What temperature range will the coating see when in service, and is the coating suitable for the intended temperature range?
- 5. Manufacturer/Material Track Record:** Do the manufacturer and the specific material have a successful track record?
- 6. Installer Qualifications:** Does the manufacturer require installer training and certification,

or can anyone purchase and install the product?

- 7. Installation Temperature:** What air temperature and substrate temperature ranges are necessary for a successful application?
- 8. Initial installed cost:** What is the initial installed cost for the selected coating system? Does this meet project budget constraints?
- 9. Maintenance:** What maintenance will be required, and at what frequency? What are the expected life-cycle maintenance costs?
- 10. Warranty:** What warranty does the manufacturer offer?
- 11. Physical Wear:** What physical wear will the coating be subjected to, and does it provide suitable abrasion resistance for the expected wear?
- 12. Cure Time:** How long does the coating need to cure before it can be put into service?
- 13. Color/Aesthetics:** What color and finishes are available? Does the color meet the project's aesthetic goals?
- 14. Volatile Organic Compound (VOC) content:** What is the VOC content of the material? Is this accept-

*Figure 1 – Liquid urethane coating application in progress (courtesy BASF).*



able for the project? Will the product be installed at an existing facility or in a confined space where off-gassing is not acceptable?

### INDUSTRY STANDARDS

There are several industry standards that can be helpful in the evaluation and comparison of pedestrian traffic coatings. (A list of some common standards is provided in a sidebar on page 26.) Unfortunately, not all manufacturers use the same set of test standards, which can make side-by-side evaluation of materials challenging. In general, test data for criteria important to the project should be provided by the manufacturer and reviewed by the designer to ensure the product is suitable for the intended application. If a manufacturer cannot provide necessary test data, the product should not be specified.

A useful resource for side-by-side comparison of materials is the SWRI Sealant Validation Program. The SWRI Sealant Validation Program is an independent program, which requires independent testing for validation of manufacturer-stated material properties and results in the granting of an SWR Institute Validation Seal, which provides the test data in a clear, concise,

and consistent manner. The SWRI program can be useful in providing an “apples-to-apples” comparison of materials.

### TYPES OF COATINGS

Cold fluid-applied pedestrian traffic coatings generally fall into two main categories: liquid urethane, and PMMA resin-based coatings. Although most manufacturers will allow the use of liquid urethane pedestrian coatings over occupied spaces, these coatings are generally not preferable for roofing applications, especially when they are not protected by a wear surface such as ceramic tile. Resin membrane systems such as polymethyl-methacrylate (PMMA) membranes are generally harder, with better resistance to both physical

damage and degradation due to ultraviolet exposure, making them more durable than liquid urethanes. PMMA membranes are a suitable choice for pedestrian coating applications over occupied space. However, they typically have lower flexibility than urethanes, so it is important to consider the flexibility of the substrate before specifying a PMMA membrane. Although liquid urethanes cost substantially less than PMMA membranes, they are generally less durable than PMMA membranes.

*Figure 2 – Completed liquid urethane coating application (courtesy Walter P Moore).*



during curing. PMMAs are also very sensitive to surface preparation, and additional care should be taken to ensure proper surface preparation with PMMA membranes.

## DETAILING AND INSTALLATION OF COATINGS

Successful coating application requires proper attention to specifications and detailing. Typical specification requirements and details that should be provided include the following:

1. Preparation of substrates (broom finish, shot-blasting, etc.)
2. Preparation and treatment of substrate cracks
3. Use of primers
4. Wet-mil thickness requirements for each membrane layer
5. Minimum required dry-mil thickness for the complete membrane system. Specifying average thickness is not recommended, as it is virtually impossible to reliably establish an average thickness measurement for a coating with aggregate.
6. Deck edge/balcony edge details
7. Deck-to-wall interface details
8. Drain details
9. Other project-specific details

Most manufacturers have a library of standard details that can be used for many typical project conditions. Job-specific details and conditions should be reviewed with a manufacturer's technical representative to confirm acceptance of the detailing for warranty purposes. Many manufacturers will also provide project-specific details on request.

## FIELD QUALITY ASSURANCE

Proper attention to field quality assurance measures is key to a successful installation. The following are recommended measures to ensure a quality installation:

1. Require submittals from the installer, including shop drawings and product data.
2. Conduct a pre-installation meeting to review detailing and installation requirements.
3. Require mock-ups (either stand-alone or in-situ as part of the completed work).
4. Review substrate after surface preparation to check for substrate

Figure 3 – PMMA balcony coating application with two-tone aesthetic (courtesy Soprema).



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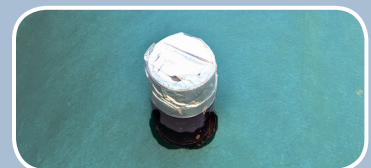


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- defects and cleanliness.
- Conduct field adhesion tests per ASTM D4541.
  - Require confirmation of coating thicknesses through the use of wet mil thickness measurements.

- Conduct water testing (nozzle testing and flood testing as applicable).

#### CONCLUSION

There are many factors to consider when choosing a cold fluid-applied pedestrian traffic coating. The two main coating material types are liquid urethane and PMMA resin. Liquid urethanes offer lower initial cost and better material flexibility, while PMMA membranes offer a longer service life and a wider range of aesthetic finish options. Regardless of the membrane selected, proper specifications, details, installation, and field quality

assurance are key elements to a successful coating project. 



Figure 4 – PMMA hallway coating with multicolored finish pattern (courtesy Soprema).



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## ONE THOUSAND MUSEUM'S EXOSKELETON POSES CHALLENGES



Photo by Philip Pessar.

The One Thousand Museum residential tower is currently under construction, adjacent to Miami's Museum Park and on the site that was long home to a MiMo-styled 1960s gas station. The 62-stories' main feature is a sinuous frame on all four elevations, designed by the late Zaha Hadid, who was called the "queen of the curve." The curvy exterior lines are structural, not applied, taking on both gravity and lateral loads.

DeSimone Consulting Engineers designed a four-elevation concrete exoskeleton bracing, with a post-tensioned floor slab system, allowing reduction of core wall thickness and lowering costs while creating column-free interior spans ranging from 30 to 50 ft.

The team used a glass-fiber reinforced concrete (GFRC) formwork system, shipped from Dubai, to form the exoskeleton. The lower floors were created using conventional cast-in-place concrete.

One edge of the building's podium lies just 6 in. from a neighboring building. The design called for a 10-ft.-thick mat atop 211 piles, each 30 inches in diameter, mostly driven down about 155 ft. Crews cast the 9500 cubic yards of concrete for the mat in one continuous placement over 26 hours and requiring almost 1000 concrete trucks.

Scheduled for completion in 2018, the building will include a double-height "sky lounge," an aquatic center with a lap pool extending to the glass curtainwall, and a tower topped by a private helipad. It will house only 83 residences (starting at \$5.5 million) on 50 floors, including eight full-floor penthouses.

– ENR