

# Methacrylate Deck Treatment Inspection Guidelines

Methacrylate deck crack treatment uses methacrylate resin to seal cracks in concrete bridge decks and is designed to be a crack sealer only. It is not a surface overlay. Methacrylate resin is used to repair newly placed decks that exceed the crack intensity limits and to rehabilitate existing bridge decks that have deteriorated over time.

Typically, the resin is applied to the deck surface by hand or mechanically sprayed and spread with a broom or squeegee. In general, the application of methacrylate on a bridge deck is a simple process. However, careful inspection is needed to assure the treatment is effective and that the treated surface maintains a desirable roadway surface condition.

This attachment contains inspection guidelines to assist Structure Construction staff when inspecting a methacrylate application.

Additional information regarding methacrylate is available in the *Concrete Technology Manual*.

## During Construction Operations

1. As a *rule of thumb*, 100 ft<sup>2</sup>/gal (2.45 m<sup>2</sup>/liter) is a good starting point for the spread rate of resin on normal concrete. Lightweight concrete will require more resin and may reduce the spread rate to about 65 ft<sup>2</sup>/gal (1.6 m<sup>2</sup>/liter). For very dense concrete, less resin is required, and the spread rate can increase to about 175 ft<sup>2</sup>/gal (4.29 m<sup>2</sup>/liter). As a *rule of thumb*, the surface above cracks should be slightly wet with resin, 20 minutes after application. This is an indicator that the cracks are completely filled. If dry after 20 minutes, increase the amount of resin being applied. If ponding is evident, reduce the amount of resin. It is essential that the resin remains fluid long enough (40 to 90 minutes) for the cracks to be filled. If rapid gelling occurs the material should be rejected.
2. Methacrylate resin must only be applied to the deck area. The contractor is required to protect or avoid placing resin on other parts of the structure (e.g., barrier rails, joints, drainage facilities, etc.). It is important to ensure resin does not leak or drip into waterways, roadways, or parking areas below the bridge. Sealing of joints and scupper drains is one method to prevent this.
3. Sand is applied to increase skid resistance. Careful inspection of the deck surface after the sand application is needed to ensure that the sand adheres to the deck. Any areas found absent of sand adhesion must be abrasively blasted. Vacuum attachments must be used during abrasive blasting operations.

4. Apply absorbent material. The absorbent material removes oily residue that can form and prevents tracking of residue onto the adjacent pavement.
5. The *Contract Specifications* include deck surface condition, temperature range and ambient relative humidity limits for application of high-molecular-weight methacrylate (resin). The deck must be dry, between 50-100 degrees Fahrenheit, and the relative humidity must not exceed 85% during application. Suggest utilizing an “Hourly Weather Forecast” tool such as one found in [NOAA](#) (National Oceanic and Atmospheric Administration), to view the forecast a few days in advance of upcoming work shifts, and share any concerns with the contractor prior to actual start of shift. In coastal areas, the relative humidity may often exceed the acceptable threshold during the night in late spring and early summer.
6. Verify manufacturer mixing guidance/sequence in the field to avoid accidents resulting in fire or explosion. Flash fire will occur if promoter (typically purple color) comes in direct contact with initiator (typically clear color). Check manufacturer’s website for most current mixing guidance.

## **Typical Problems Associated with Bridge Deck Methacrylate Resin Treatment Operations**

1. **Oiliness:** The tack, or the oiliness, of methacrylate resin can create serious problems, especially in cold night closures. Opening traffic lanes prior to the complete cure of the resin can cause the tracking of residue, oiling of cars, and/or reduced skid resistance. This issue is due to *oxygen inhibition* of the top surface. Methacrylate resin cures from the lack of oxygen; thus, the exposed surface tends to cure last. Even if the bulk of the resin sets up and can resist penetration with a screwdriver, the surface can still be covered with an oily sheen. Modern methacrylate resins contain additives to prevent this phenomenon.
2. **Inability to spread material:** Heat and sunlight can cause methacrylate to set faster. Occasionally, the resin will set before the material is spread. This causes the worst case for crack sealing as it prevents the resin from properly flowing into the cracks.
3. **Sand does not adhere:** Resin that sets prior to applying sand will result in the creation of glassy spots. The glassy areas may have reduced skid resistance and remedial work to repair these areas would be required. Methods that have been proven effective are to abrasively blast the glassy areas. For larger areas where the sand was not promptly applied and didn’t adhere, resin and sand can be reapplied (time permitting).