

METHYL METHACRYLATE (MMA) POLYMER MATERIALS FOR CONCRETE REPAIR
(REV 11/20/25)

SECTION 930 is deleted and the following substituted:

METHYL METHACRYLATE (MMA) POLYMER MATERIALS FOR CONCRETE REPAIR

930-1 Description.

Use methyl methacrylate (MMA) polymer materials when repairing concrete including defects or purposely placed openings in concrete elements. The requirements for epoxy resin materials are covered in Section 926. Any depth larger than the manufacturer's recommendation for the specific material shall be repaired with portland cement concrete meeting the requirements of Section 346.

930-2 Product Acceptance on the Project.

930-2.1 Product Acceptance: Use only products listed on the Department's Approved Product List (APL). Manufacturers seeking evaluation of products must submit an application in accordance with Section 6 and include independently certified test reports that the material meets the requirements of this Section. The application package must describe detailed quality control requirements for installation including, but not limited to: formulation for two or more component systems, special materials and/or equipment, recommendations for all surface preparation, and curing requirements.

Provide the Engineer certification conforming to the requirements of Section 6 from the manufacturer confirming that the materials used meets the requirements of this Section and is the appropriate product for the intended use.

When specified in the Contract Documents, furnish a report of test results from an independent laboratory on samples taken from material shipped. Ensure the test was performed within 45 days prior to the shipping date of the material.

930-2.2 Material Supply, Storage, and Marking: The material shall be pre-proportioned including aggregate. Deliver products in original, unopened containers with manufacturer's name, date of manufacture, and clearly marked with all information described below. Store the material in an elevated dry and weather protected enclosure in full compliance with the manufacturer's recommendations. Material must be used within manufacturer's recommended shelf life.

The material from which the containers are made shall have water vapor transmission not greater than 100 g/m² in 24 hours as determined in accordance with Procedure B of ASTM E96.

All containers shall be marked with the following information:

1. LOT identification number and material expiration date
2. Directions for use shall include but are not limited to the following:
 - a. The type and kind of primer recommended (if any) to bond fresh repair material to the concrete or mortar being repaired.
 - b. The recommended amount of liquid component, to be mixed with the package contents.

c. The recommended length of mixing time or sequence of mixing in minutes.

3. Date the material was packaged.

4. The yield in cubic feet or yield in ft²/in thickness when mixed with the recommended amount of liquid.

5. The net weight in each container. The contents of any container shall not vary by more than 2% from the weight stated in the declarations. The average weight of filled containers in a LOT shall be not less than the individual weight stated in the declarations.

6. State the approximate working time.

930-2.3 Sampling, Mixing, and Additional Testing: A LOT is the packaged repair material normally placed on a pallet. A unit sample is a single container or package of material randomly selected from the LOT. Mix and install the materials in accordance with the manufacturer's recommendations. Manufacturers will be required to provide field representation upon request by the Engineer. The Department reserves the right to conduct further field testing on any approved material.

930-2.4 Rejection: All broken containers will be rejected. Material that fails to meet any of the requirements of this Specification will be rejected. Report all materials failing to meet this specification and state the reasons for rejection in writing to the Engineer and the producer or supplier. Reject materials that have exceeded the product's shelf life.

930-3 Laboratory Specimen Preparation.

930-3.1 Mixing and Fabrication: Mechanically mix the dry packaged materials with liquid components in accordance with the manufacturer's recommendations.

930-3.2 Length Change: Make and cure the test specimens in accordance with ASTM C157, except omit the curing period in Section 10.3; however 11.1.2 shall apply for 28 day curing period.

930-3.3 Manifestly Faulty Specimens: Visually examine each group of specimens representing a given test or a given age of test, including tests of freshly mixed concrete, before or during the test, or both, whichever is appropriate. Discard any specimen found to be manifestly faulty by such examination without testing. Visually examine all specimens representing a given test at a given age after testing, and should any specimen be found to be manifestly faulty the test results thereof shall be disregarded. Should more than one specimen representing a given test at a given age be found manifestly faulty either before or after testing, the entire test shall be disregarded and repeated. The test result reported shall be the average of the individual test results of the specimens tested or, in the event that one specimen or one result has been discarded, it shall be the average of the test results of the remaining specimens.

930-4 Methyl Methacrylate (MMA) Polymer Materials for Repair of Predominately Horizontal Surfaces.

930-4.1 General: This material is intended to be used to repair concrete where the area to be treated will be on a horizontal surface, and shall be self-consolidating. Examples of the type of locations for these materials are bridge decks, portland cement concrete pavements and other locations required by the Contract Documents. Follow the manufacturer's recommendations for preparing the surfaces, mixing, placing, and curing the repair material unless otherwise directed in the Contract Documents.

930-4.2 Physical Properties: The repair material shall meet or exceed the physical properties stated in Table 1 as determined by the specified test methods.

Table 1 – Physical Properties of MMA Polymer Repair Materials for Horizontal Surfaces		
Requirement	Test Method	Test Value
Minimum Compressive Strength, psi		
3 hours	ASTM C109	6,000
24 hours		8,000
7 days		Greater than or equal to strength at 24 hours
Maximum Length Change, %		
Allowable shrinkage at 28 days when air cured compared to length at one day	ASTM C157**	-0.08
Maximum Absorption (@ 7 days), %	ASTM C413	1
Minimum Flexural Strength (at 7 days), psi	ASTM C348	2000
Time of Setting (Initial), minutes	ASTM C191	15 to 45
Minimum Bond Strength by Slant Shear, psi		
24 hours	FM 5-587	2,000
7 days		Greater than or equal to strength at 24 hours
Thermal Compatibility, Minimum Bond Strength by Slant Shear, psi		
24 hours	FM 5-609	90% of control specimen
7 days		
* Air cure all specimens at normal laboratory temperature (73° ± 3° F; not greater than 55% relative humidity)		
** Make and cure the test specimens in accordance with ASTM C-157, except omit the curing period in Section 10.3; however 11.1.2 shall apply for 28 day curing period.		

930-5 Constructability.

Furnish to the Engineer for approval shop drawing as may be required to complete repairs in compliance with the design shown in the Plans and the manufacturer's recommended repair system.