

SUPPLEMENTAL SPECIFICATION

SECTION 780 - CONCRETE REPAIR MATERIALS

780.01, GENERAL REQUIREMENTS.

- (a) Packaging. The manufacturer's product designation and recommendations for surface preparation, mixing, placing, finishing and curing shall be clearly outlined on the product packaging. Handling precautions and toxicity warnings shall be printed on all containers. The expiration date and a lot number shall appear on each package of material delivered to the project site. Liquid components which have been frozen shall not be used.
- (b) Sampling and Testing. Upon request, the Materials and Research Division will furnish a list of products that have been tested and are considered satisfactory. Should the Contractor wish to use a product not included on the approved list, he/she may submit an alternate product. Application for material approval shall be submitted to the Materials and Research Division accompanied by a 45 Kg (100 lb.) sample of the product and complete material safety information. Upon approval, the product name and manufacturer will be placed on the Agency's approved list. A minimum period of two months shall be allowed for testing purposes.

780.02, OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL. Overhead and vertical concrete repair material shall be a prepackaged material to be used for patching spalled areas of concrete that are either on vertical or overhead surfaces. Its use shall be limited to patches with an average layer thickness of 37.5 mm (1.5 inches) on vertical repairs and 25 mm (1 inch) on overhead repairs, as directed by the Engineer.

The product shall meet the following requirements:

- (a) Compressive Strength. The neat material shall exhibit a minimum seven day compressive strength of 13.8 MPa (2,000 psi) and a minimum twenty-eight day strength of 27.6 MPa (4,000 psi) when tested in accordance with AASHTO T-106.
- (b) Flexural Bond Strength. The material shall exhibit a minimum bond strength of 1 MPa (150 psi) when tested in accordance with Vermont Agency of Transportation MRD-3.
- (c) Freeze-Thaw Durability. Resistance to rapid freezing and thawing shall be determined in accordance with AASHTO T-161 using Procedure A (Modified) for use of a 3% Sodium Chloride solution. The material shall exhibit no more than an 8% loss in weight after 300 cycles.
- (d) Volume Stability. The material shall exhibit expansion of not more than 0.40% and shrinkage of no more than 0.05% when tested in accordance with the Corps of Engineers test method CRD 621 (Modified).
- (e) Placement. The material shall be capable of being placed in layers of at least 25 mm (1 inch) for overhead applications without the use of form work or anchoring devices.
- (f) Color. The material shall produce a finished patch of the same color as the existing surface, or shall be concrete gray in color.

780.03, RAPID SETTING CONCRETE REPAIR MATERIAL. Rapid setting concrete material shall be a prepackaged material to be used for patching horizontal concrete surfaces where rapid return of the structure to service is necessitated.

The product shall meet the following requirements:

- (a) Compressive Strength. The neat material shall exhibit a minimum two hour compressive strength of 8.3 MPa (1,200 psi) and a seven day compressive strength of 34.5 MPa (5,000 psi) when tested in accordance with AASHTO T-106.
- (b) Time of Setting. When tested in accordance with AASHTO T-131 (Modified), the initial time of set shall not be less than 15 minutes. The material shall exhibit no more than an 8% loss in weight after 300 cycles.
- (c) Freeze-Thaw Durability. Resistance to rapid freezing and thawing shall be determined in accordance with AASHTO T-161 using Procedure A (Modified) for use of a 3% Sodium Chloride solution. The material shall exhibit no more than an 8% loss in weight after 300 cycles.
- (d) Volume Stability. The material shall exhibit expansion of not more than 0.4% and shrinkage of no more than 0.05% when tested in accordance with the Corps of Engineers test method CRD 621 (Modified).
- (e) Flexural Bond Strength. The material shall exhibit a minimum bond strength of (100 psi) without the use of a special bonding agent when tested in accordance with Vermont Agency of Transportation MRD-3.

780.04, RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE. Rapid setting concrete material to contain coarse aggregate shall be a prepackage material to be used for patching horizontal concrete surfaces where rapid return of the structure to service is necessitated. This material shall be formulated for the optional addition of 9.5 mm coarse aggregate to produce a rapid setting concrete mixture.

The product shall meet the following requirements as well as the material requirements of 780.03.

- (a) Compressive Strength. The neat material plus coarse aggregate shall exhibit a minimum four hour compressive strength of 13.8 MPa (2,000 psi), a one day compressive strength of 20 MPa (2900 psi), and a seven day compressive strength of 34.5 MPa (5,000 psi) when tested in accordance with AASHTO T-22.
- (b) Time of Workability. Time of workability as observed under laboratory conditions shall not be less than 15 minutes.
- (c) Freeze-Thaw Durability (Concrete Specimens). Resistance to rapid freezing and thawing shall be determined in accordance with AASHTO T-161 using Procedure A, Modified for use of a 3% Sodium Chloride solution. The concrete shall exhibit no more than an 8% loss in weight after 300 cycles.