

***CORROSION ENGINEERING SPECIFICATION FOR
INSTALLATION***

***INSTALLATION OF CORROSION ENGINEERING EPOXY
LININGS ON CONCRETE LESS THAN 28 DAYS OLD***

1. SCOPE

- 1.1 The following specification governs materials, preparation and installation of Corrosion Engineering's epoxy based linings on concrete that is less than 28 days old. Products included in the specification include but may not be limited to: THINSET[®] Adhesive, PENNCOAT[®] 210, 221, 227, PENNTROWEL[®] Epoxy L/F, and 250 Surfacers. Other products may be included if noted in writing by Corrosion Engineering. This specification is not applicable for vinyl ester based materials. Consult Corrosion Engineering if in doubt as to the applicability of this specification.
- 1.2 During normal construction scheduling, it is often not possible to achieve broadly referenced cure time of 28 days before commencement of lining work. In actual fact, there is no real scientific basis for the establishment of this 28 day rule of thumb. The required cure of the concrete is a function of the tensile and compressive strength of the concrete, as well as the moisture content of the concrete before commencement of lining work.

2. CONCRETE

2.1 Concrete Mix Design

Portland Cement Concrete (PCC) that is to be coated with subsequent linings shall incorporate a mix design that achieves a tensile strength of as minimum of 200 psi tensile strength and 2000 psi compressive strength. Such mix design shall incorporate normal water and cement reducing admixtures as well as further incorporating plasticizers, or super plasticizers as required. The exact mix design is beyond the scope of this specification, due to the wide variability of admixture supply contracts of the local ready-mix company, as well as the anticipated temperature and environmental considerations

**INSTALLATION OF CORROSION ENGINEERING EPOXY LININGS ON CONCRETE
LESS THAN 28 DAYS OLD
SPECIFICATION CES-362
10/12 SUPERSEDES 07/04 PAGE 2 OF 4**

during curing. Consult with ready-mix supplier as to the required mix design to meet the above strength requirements within in the allotted time frame before commencement of lining work.

2.2 Concrete Vapor Barrier

Use of a concrete vapor barrier is not recommended for slab-on-grade concrete to receive linings. In the event concrete is being placed in areas of high water table where a vapor barrier may be being considered, consult Corrosion Engineering for further discussion.

2.3 Concrete Placing and Finishing

Concrete to be lined shall be finished in accordance with good practice as specified by ACI. Finish shall a wood float finish followed by a single light pass with a steel trowel. Do not over-finish.

2.4 Concrete Curing

Concrete shall be cured using wet burlap or polyethylene. Do not use curing agents.

2.5 Concrete Acceptance

All concrete to be lined shall be tested for strength by using a Schmidt hammer or equivalent before commencement of lining work to insure the concrete has achieved the strength requirement outlined in section 2.1 above. Concrete shall further be tested for presence of moisture by using ASTM test method D4263 - Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method. A darkening of the concrete shall be deemed acceptable for commencement of lining work under section 3 below. Presence of moisture droplets under the plastic sheet shall be deemed as not acceptable.

2.6 Concrete Surface Preparation

Concrete surface shall be prepared in accordance with ASTM standards:
D4258 - Practice for Surface Cleaning Concrete for Coating
D4259 - Practice for Abrading Concrete
D4260 - Practice for Etching Concrete

**INSTALLATION OF CORROSION ENGINEERING EPOXY LININGS ON CONCRETE
LESS THAN 28 DAYS OLD
SPECIFICATION CES-362
10/12 SUPERSEDES 07/04 PAGE 3 OF 4**

3. DAMP SURFACE PRIMER

- 3.1 Surfaces to receive subsequent epoxy linings shall be primed with Corrosion Engineering's moisture tolerant PENNTROWEL® Epoxy Primer (Product Data Sheet CE-139). Follow all mix and application details as noted on product data sheet and installation specifications, as well as additional points noted in section 3.2 and 3.3 of this specification.
- 3.2 PENNTROWEL Epoxy Primer shall be diluted with 5% by volume of MEK before installation of primer. This allows for greater penetration into the concrete (because of the lower primer viscosity) and to allow a thinner coat of primer to be applied. The final dry film thickness of the primer shall not be greater than 5 mils DFT. Thinning the primer also allows primer to cure faster than uncut primer does. Primer shall be allowed to cure until "dry to touch". The length of cure time required for the primer is variable, depending upon ambient temperature.
- 3.3 Primer installation shall be performed by using a stiff coarse scrub brush, and primer shall be vigorously brushed into the concrete. A slightly milky appearance to the primer may occur, and this is desirable, as it indicates the primer is reacting with residual moisture in the concrete.

4. LINING INSTALLATION

- 4.1 Lining installation shall begin after PENNTROWEL Epoxy Primer has dried to touch. Some slight residual tackiness may remain when the weight of a worker walks on the primer, but this degree of cure of the primer shall be acceptable provided traffic on the tacky lining does not disrupt the primer, and workers footwear is suitably clean to not contaminate the lining and cause bonding issues of the subsequent layers. Steel cleated golf shoes may be worn when walking on tacky primer, and are suggested..

5. SAFETY PRECAUTIONS / DISCLAIMER

- 5.1 Read and follow the hazard information, precautions and first aid directions on the individual product labels and material safety data sheets before using. While all statements, technical information, and recommendations contained herein are based on information our company believes to be reliable, nothing contained herein shall constitute any warranty, express or implied, with respect to the products and/or services described herein and any such warranties are expressly disclaimed. We recommend that the prospective purchaser or user independently determine the suitability of our product(s)

**INSTALLATION OF CORROSION ENGINEERING EPOXY LININGS ON CONCRETE
LESS THAN 28 DAYS OLD
SPECIFICATION CES-362
10/12 SUPERSEDES 07/04 PAGE 4 OF 4**

for their intended use. No statement, information or recommendation with respect to our products, whether contained herein or otherwise communicated, shall be legally binding upon us unless expressly set forth in a written agreement between us and the purchaser/user.

- 5.2 Please contact Corrosion Engineering for specific recommendations at +1-610-833-4000 or fax +1-610-833-3040.

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