REMR MATERIAL DATA SHEET CM-CR-1.7

EPOXY RESIN SYSTEM FOR DORMANT CRACK REPAIR: DURALITH

1. NAME

Duralith

2. MANUFACTURER

Dural International Corporation
95 Brook Avenue
Deer Park, New York 11729
Telephone: 516-586-1655

3. DESCRIPTION

Duralith epoxy is a low viscosity, high-modulus adhesive and mortar binder for repairs of structural concrete. It is a 100 percent solids, moisture-insensitive, two-component epoxy system suitable for application at temperatures as low as 30 °F.

4. APPLICABLE SPECIFICATIONS

Duralith meets ASTM C 881, Type I & II, Grade I, Class A & B specifications.

5. USES

Duralith is used for bonding or pressure grouting of structural members. When mixed with aggregate, it yields a high strength epoxy mortar for patching and overlays.

6. MANUFACTURER'S TECHNICAL DATA

Epoxy properties:

Color, Part A (base)	Amber
Part B (hardener)	Amber
Mixing ratio (A:B)	2:1
Mixed viscosity, cp @ 75 °F	500-1,000
Pot life, min	10-20
Tack free, hr (thin film)	2
Initial cure, hr	3
Tensile strength, psi	5,000 min
Tensile elongation, %	1-3
Tensile modulus, psi	275,000-375,000
Compressive strength, psi	9,000 min
Compressive modulus, psi	250,000-350,000

Mortar properties (with 3 parts sand):

Compressive strength, psi	8,000 min
Compressive modulus, psi	250,000-350,000

7. MANUFACTURER'S GUIDANCE FOR APPLICATION

Surface preparation: Remove all dirt, dust, grease, oil, soap, detergents, and other contaminants and coatings which can prevent proper adhesion to the surface. Do not allow the use of curing compounds on new concrete. If such a compound has been used, remove it thoroughly. Remove loose particles and weak sections. Remove asphalt and oil contaminants with detergent and thoroughly rinse with water. Then etch surfaces with 15 percent hydrochloric acid and thoroughly rinse with water, or sandblast or mechanically scarify and vacuum.

Mixing: Premix Part A and Part B.

Binder: Combine Part A and Part B, 2:1 by volume, and mix thoroughly with electric drill and paddle. Do not mix materials at temperatures below 50 °F.

Mortar: Mix Part A and Part B as in Binder, and then gradually add aggregate mixing thoroughly. Use 1 part Binder to 4 parts aggregate.

Application: Duralith Systems are suitable for application at temperatures as low as 30 °F and at higher temperatures when a fast cure and high early strength development are desired. For applications at temperatures above 50 °F and slower cure, use Duralcrete. For low temperature applications, it is advisable to precondition and mix the two components at 50 °F or higher.

Adhesive:

New to old concrete: Apply thin, uniform layer of Duralith with brush, roller, broom or squeegee. Avoid forming pools or puddles. Place new concrete before Duralith hardens (contact time, two hours). (If Duralith hardens or gels, apply a new coat of Duralith.) Follow normal procedures when placing concrete. Thin mortar and thin layer terrazzo should be kept moist for at least 3 days.

Hardened to hardened concrete: Apply Duralith with spatula, brush, or trowel. Bring surfaces into contact and hold or clamp firmly.

Overlays and patching: (Horizontal applications only) Prime surfaces with premixed binder (no sand). Allow 5 to 15 min at 75 °F to lapse (longer at lower temperatures) and then apply Duralith mortar with trowel.

Grouting: Use Duralith neat or mixed with sand as required. Apply with pump, shovel, or other suitable tools.

Pressure grouting: Duralith LV, a low viscosity, high modulus adhesive, is recommended for pressure grouting.

Caution: Duralith contains an alkaline amine. Avoid contact with skin or eyes. In case of contact, wash skin with soap and water. Flush eyes immediately with water and see a doctor. If Duralith is used indoors, provide adequate ventilation.

8. CORPS OF ENGINEERS' EVALUATION

Duralith was one of eight adhesives chosen for evaluation in REMR Work Unit 32308. Results of this study are reported in Technical Report REMR-CS-11, "In Situ Repair of Deteriorated Concrete in Hydraulic Structures: Laboratory Studies," Jan 1988. After selected physical properties of Duralith were determined, the adhesive was used to inject cracked concrete slabs. The effectiveness of the repairs was evaluated by means of preinjection and postinjection ultrasonic pulse velocity measurements, by visual examination of cores removed from each slab, and by splitting tensile strength tests done on discs cut from the cores removed from the repaired slabs.

Viscosity, cp (at 25 °C)	500-1,000
Gel time, min (2-ml sample at 25 °C)	13-18
Slant shear bond strength, psi (ASTM C 882)	
Air-dried concrete	>3205
Water-saturated concrete	255

	Air-dried Concrete	Water-saturated Concrete
Ultrasonic pulse velocity, fps		
Preinjection	11,306	12,744
Postinjection	14,596	14,355
Splitting tensile strength*, psi	595	652

* Uncracked, air-dried concrete had a splitting tensile strength of 616 psi.

9. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of activities involving potentially hazardous and toxic chemical substances. Manufacturer's recommendations to protect occupational health and environmental quality should be carefully followed. Material safety data sheets must be obtained from the manufacturers of such materials. In cases where the effects of a chemical substance on occupational health or environmental quality are unknown, chemical substances should be treated as potentially hazardous toxic materials.