



REMR MATERIAL DATA SHEET CM-CR-1.3

EPOXY RESIN SYSTEM FOR DORMANT CRACK REPAIR: BRUTEM 78

(Supersedes previously issued CM-CR-1.38)

1. NAME

Brutem 78
Epoxy Pressure Injection Adhesive

2. MANUFACTURER

Master Builders, Inc.
23700 Chagrin Boulevard
Cleveland, OH 44122
Telephone: (216) 831-5500

3. DESCRIPTION

Brutem 78 is a two-component, 100-percent solids, low-viscosity epoxy adhesive. It is moisture insensitive, has high tensile elongation, and has excellent bond to concrete.

4. APPLICABLE SPECIFICATIONS

ASTM C 881, "Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete," is a guide in specifying the material.

5. USES

Uses: Brutem 78 is especially designed for being injected in cracks in concrete structures to their original monolithic design. It can be used to repair bridges, dams, column supports, beams, parking garage structures, commercial buildings, and monuments. It will prevent moisture penetration which may cause reinforcing-bar corrosion in concrete. Use for grouting anchor bolts and cracks in equipment foundations.

6. MANUFACTURER'S TECHNICAL DATA

Product characteristics:

Color (mixed)	Amber
Viscosity (mixed at 77° F)	200 centipoises ± 50
Pot life (at 77° F) (150 g)	20 min
Shelf life	Minimum 1 yr, if kept tightly sealed
Packaging	3-gal, 15-gal units
Yield	1 gal yields 231 cu in.

Gel time in wide cracks (at 77° F). Tested between concrete blocks approximately 1-ft by 1-ft area.

<u>Gap Width, in.</u>	<u>Gel Time, min</u>
1/4	90
1/2	35
3/4	25
1	20

Thin film tack free time (at 77° F, 4 mil thickness)	3 to 5 hr
Thin film full cure (at 77°)	3 days
Thin film full cure (at 45° F)	6 days

Properties of Cured System

Compressive strength (ASTM D 695)	7,505 psi
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Compressive modulus (ASTM D 638)	2.07 × 10 ⁵ psi
Tensile Strength (ASTM D 638)	5,055 psi
Tensile modulus (ASTM D 638)	1.05 × 10 ⁵ psi
Tensile elongation (ASTM C 638)	11.0 percent
Shear strength (ASTM D 732)	4,726 psi

mixing at the nozzle of the gun. For smaller jobs, it can be injected by hand using a grease gun. The low-viscosity adhesive fills cracks as thin as 2 mils through a series of ports that are left in the crack after it has been sealed with Concrete Paste SPL Adhesive.

7. MANUFACTURER'S GUIDANCE FOR APPLICATION

Application: Brutem 78 is intended for use with specialized mixing and pumping equipment. Information concerning application and alternate methods of injection grouting will be furnished by Master Builders representative upon request.

The adhesive is injected by pressure through metering pumps with internal

Safe handling information: Resin and curing components may be irritating to the eyes and skin on contact. If any of the material gets into the eyes, they should be immediately flushed with water. If there is skin contact, the area should be washed with soap and water. Vapors may cause headache, dizziness, nausea, and unconsciousness. Anyone who inhales the vapors must be moved to fresh air and given artificial respiration if he is not breathing. A person swallowing the material should be given large amounts of water to drink, and a physician should be called. Contaminated clothing should be removed.

The material should be kept away from open flames. Foam, dry chemical, carbon dioxide, water spray, or fog should be used to put out fires involving these materials.

8. CORPS OF ENGINEERS' EVALUATION

Technical data:

<u>Performance Properties at 73° F, Relative Humidity 50%</u>	<u>Test Method</u>	<u>Results</u>
Viscosity, centipoises	ASTM D 2393	300
Gel time, min	ASTM C 881	48
Bond to concrete, psi	ASTM C 882	2,160
Effect of moisture on bond strength, psi	ASTM C 882	720
Compressive strength, psi	ASTM D 695	7,910
Young's modulus of elasticity, psi	ASTM D 695	2.10 × 10 ⁵
Tensile strength, psi	ASTM D 638	3,160
Tensile elongation, percent	ASTM D 638	11.3
Flexural yield strength, psi	ASTM D 790	750
Shrinkage volumetric, percent	--	3.85
Hardness	ASTM D 2240	67
Water absorption, percent	ASTM D 570	0.34

9. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of crack repair 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 should 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.

10. AVAILABILITY AND COSTS

Availability: The system is marketed through a network of local distributors.

Cost: The cost was \$43.00/gal in 1986.

11. TECHNICAL SERVICES

Technical services are available for application procedures and supervision of use of materials. A Master Builders representative can supply further information.