



Expansion Joint Systems

Delcrete® with Del Agg Elastomeric Concrete Patching System

Introduction

In 1983, Delcrete® Elastomeric Concrete was introduced on I-10 in Louisiana as a bridge expansion joint assembly structural anchoring and nosing material. Since then, Delcrete® has evolved into a spall repair material for high performance concrete pavements.

Advantages

Delcrete® Elastomeric Concrete is a free-flowing, two-part polyurethane material compounded with an aggregate system to develop an excellent bond to a variety of surfaces, including concrete and steel. Delcrete® has wide applications in concrete pavements due to its flexibility, outstanding anti-spalling property, high load bearing capacity, and resistance to chemicals including jet fuel and deicing fluids. Delcrete® can be mixed and poured easily at the job site and cures rapidly in normal temperatures. The typical Delcrete® application is in concrete spall repair patching or bridge expansion joint work.

Physical & Performance Properties

Binder and Aggregate

Test	Test Method	Specification
Original Properties (after conditioning at 100°F [37°C] for 7 days)	Tensile Strength, psi (mPa) Elongation, % Hardness, Durometer D	+100% -50% 600 (4.14) Min. 25 Min. 50 Shore D Max.
Compression Properties	Compressive Stress, psi (mPa) 5% Deflection Resilience, % 5% Deflection	ASTM D695 See Note 2 See Note 3 800 (5.52) Min. 70 Min.

Continued	Test	Test Method	Specification
Impact Properties	Ball Drop, ft.-lb. (Joule) @ -20°F (-29°C)	See Note 4	>10 (13.56) (No cracks)
Adhesion Properties	Dry Bond Strength to Concrete, pli (KN/M) Wet Bond Strength to Concrete, pli (KN/M)	See Note 5 (Dry) See Note 5	400 (61.30) Min. 250 (43.78) Min.

Properties Binder Only

Test	Test Method	Specification
Tensile Strength, psi (MPa)	ASTM D638	1,500 (10.34) Min.
Original Properties (after conditioning at 100°F [37°C] for 7 days)	Tensile Stress, 100% psi (MPa)	ASTM D638 500 (3.45) Min.
Elongation, %	ASTM D638	200 Min.
Hardness, Durometer A	ASTM D2240	90 +/-3 A
Tensile Properties, After Oven Aging (7 days @ 158°F [70°C])	Tensile Strength, psi (MPa)	ASTM D573 (D638) 1,500 (10.34) Min.
	Tensile Stress, psi (MPa)	ASTM D573 (D638) 500 (3.45) Min.
	Elongation, %	ASTM D573 (D638) 200 Min.
	Hardness, Durometer A	ASTM D573 (D2240) 90 +/-3 A

Physical Properties Notes

Note 1. Test specimens are six-inch (15.24 cm) dumbbells (with one-inch [2.54 cm] bench marks) cut from cast film approximately 80 mils (.204 cm) thick.

Note 2. Test specimen is a cast two-inch (5.08 cm) cube. (Machine crosshead speed is 0.05 inch [.127 cm] per minute.) Compressive strength is maximum load carried by the

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specimen divided by original cross-section area. (A compressometer is used to make the measurement.)

Note 3. Test specimen is a cast two-inch (5.08 cm) cube. Specimen compressed to desired amount. (Machine cross-head speed is 0.05 inch [.127 cm] per minute.) Five minutes after load is removed the specimen thickness is measured. Percent recovery is determined as follows:

$$\frac{\text{Deflection} + \text{final thickness} - \text{initial thickness}}{\text{Deflection}}$$

Note 4. Test specimen is a cast disk 2.50 inches (6.35 cm) in diameter and 0.375 inches (.953 cm) thick. Specimens are conditioned four hours at test temperatures. A one-pound (454 g) steel ball is dropped onto the center of the specimen through a plastic guiding tube from an initial height of five feet (1.52 M). The drop height is increased by one-half foot (.152 M) intervals until specimen cracks. (Drop is made within ten seconds after removal of specimen from the exposure condition.) Average of four test specimens.

Note 5. Delcrete® is cast against a mortar-briquette half (briquette conforms to ASTM C190). Briquette is sawed in half so that cut surface area equals approximately one square inch (6.45 cm²). Surface is sandblasted (36 mesh). Briquette is placed in mold and Delcrete® is cast against it. Specimen is submerged in water (seven days @ RT). Using the Riehle Briquette Tester specimen failure is considered to occur at either the bond interface or within one of the two materials.

Preparation of Surface

Sawcut area to be repaired to the dimensions indicated in the plans or as directed by the owner. Prior to application of the Delcrete®, the surface shall be dry and shall be sandblasted to ensure it is free from dirt, grease, oil laitance or other foreign material which may reduce the bond between the spall repair material and the concrete pavement. After sandblasting, primer should be applied to the pavement and allowed to set 30 minutes (minimum)

before introducing spall repair material. There shall be no fugitive dust from the sandblasting operation. A minimum patch size of 1 x 1.5 feet by 2 inches deep is recommended.

Application

Spall repair materials shall be weighed and mixed in accordance with manufacturer's recommendations. The material shall be placed into the area to be repaired in layers up to the finished grade within four minutes of the initial mixing. Allow the material to cure two hours before opening to construction traffic.

Mixing

- Place sand/stone mix in a plastic bowl or pail.
- Pour 3000 ml Part A and 1500 ml Part B into respective beakers (use level line).
- Add Part A and Part B to mixing bowl. Mix at low speed.
- Immediately add sand/stone mixture on low speed.
- Mix for 20-35 seconds when using a Hobart mixer.

Pouring

- Take the material to the blockout. Start at one end, working across the spalled area, leveling and troweling "as-you-go".
- Never leave a partially filled blockout at lunch breaks, etc.

Weather Limitations

Spall repair shall be performed only when the ambient air temperature is 45°F (7°C) and rising. The temperature of the concrete to be repaired shall be 45°F (7°C) or above. Do not install when any moisture is present.

Total working time with Delcrete® from adding Part A and Part B to final trowel is approximately five (5) minutes.