



# FIVE STAR

## TECHNICAL BULLETIN 110

### Proper Testing for Compressive Strength of Five Star® Epoxy Grouts

Five Star® Epoxy Grouts should be tested for compressive strength using 2" x 2" cube specimens made in brass or steel cube molds as directed in ASTM C 579, Method B. The use of cover plates on cube molds ensures more accurate testing and is highly recommended. Using cylinders, plastic molds or curing at temperatures below 70°F will all result in lower compressive strengths being reported.

The most critical aspect of testing epoxy grouts for compressive strength is the rate at which epoxy cube specimens are loaded; ASTM C 579 specifically designates one of two load rates only:

**Load Rate I:** 6,000 psi per minute load rate.

**Load Rate II:** 0.1 to 0.125 inches per minute crosshead speed x specimen height (2") = 0.20 to 0.25 inches/minute for a 2" epoxy grout cube.

ASTM C 579 further states about the two load rate methods: "the above load rates are not identical and may produce different compressive strength results."

Since Five Star Products, Inc. tests and reports compressive strength data based upon Load Rate II, it is highly recommended that any testing facility have its compression tester calibrated to Load Rate II when testing Five Star® Epoxy Grouts. At no time should epoxy grouts ever be tested using a load rate other than what is specified in ASTM C 579. Using load rates other than that specified in ASTM C 579, such as load rates for cement-based grouts (ASTM C 109), concrete or other materials will result in much lower compressive strengths reported.

#### A. Equipment Required for Testing

- 2" x 2" brass or steel cube mold + cover plate [*plastic molds or plastic inserts are not acceptable*]
- Release Agent
- Compression Testing Machine Calibrated to Load Rate II
- Curing Location Temperature 70°F – 75° F.

#### B. Test time tolerances

- 1 day ± ½ hour (from start time)
- 7 days ± 3 hours (from start time)

#### C. Compressive Strength Requirement

- See Product Five Star® Datasheet of product being tested.

#### D. Testing Procedure

1. Using mold release agent, spray cube mold and cover plate.
2. Fill all cube molds halfway with epoxy grout. Tamp or rod epoxy grout in mold using tongue depressor or tamping rod to remove any entrapped air. Fill mold full with epoxy grout and tamp/rod second layer into first layer. Remove any entrapped air. Fill molds to a slightly overfill condition.



2" x 2" brass cube mold with cover plate



Fill molds halfway with epoxy grout then tamp or rod to remove entrapped air.

3. Strike off excess epoxy grout from mold.
4. Screed off epoxy grout with tongue depressor or margin trowel using sawing motion so the surface of epoxy grout is flush with the top of the mold.
5. Clean off any excess material on the top of the mold.
6. Place the cover plate on the mold and tighten with screws or clamps.
7. Move the mold to a nearby job site trailer or similar area where temperatures are above 65°F and leave undisturbed for 24 hours. **DO NOT** transport newly cast cube specimens of epoxy grout for 24 hours.
8. Identify cubes with product name, batch code, amount of aggregate, start time, test date and temperature.
9. Leave mold undisturbed for 24 hours.
10. De-mold cubes after 24 hours and test one cube. The other cube is tested at 7 days and the other is held as a retain or can be tested at 28 days. Confirm proper calibration of compression tester where required.
11. When testing cubes do not apply the load to the original top or bottom cube surfaces (rotate cubes 90° before loading in compression tester).
12. Record the compressive strength in pounds per square inch by dividing the cross sectional area by load



*Screed off excess epoxy grout using a trowel or tongue depressor and clean off any excess material on top of the mold.*



*Tighten the cover plate with screws or clamps.*

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