TECHNICAL BULLETIN 110

PROPER TESTING FOR
Compressive Strength

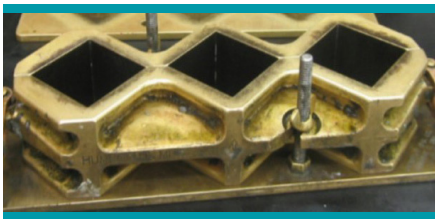
Five Star® Epoxy Grouts should be tested for compressive strength using 2" cube specimens made in brass or steel cube molds as directed in ASTM C 579, Method B. The use of cylinders or curing at temperatures below 69°F (21°C) will all result in lower compressive strengths being reported. Plastic molds/inserts should not be used.

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 two different load rates but only load rate II may be used to test Five Star epoxy grouts:

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

Using anything other than load rate II can result in different compressive strength results than the published Five Star Products compressive strengths.

Five Star Products, Inc. tests and reports compressive strength data based upon Load Rate II. It is required that testing facility use Load Rate II when testing Five Star® Epoxy Grouts. If lab equipment cannot test to Load Rate II, contact Five Star Products. Using a load rate other than Load Rate II may result in lower compressive strengths.



A. 2"x2" Brass cube mold

A. Equipment Required for Testing

- 2" brass or steel cube mold (plastic molds or plastic inserts are not acceptable)
- Mold release agent
- Compression Testing Machine calibrated to Load Rate II
- Curing Location Temperature 69 - 77°F (21 - 25°C)

B. Test Time Tolerances

- 1 day ± ½ hour (from start time)
- 7 days ± 3 hours (from start time)
- 28 days ± 12 hours (from start time)

C. Compressive Strength Requirement

- Refer to the project specifications.

FIVE STAR PRODUCTS, INC.
2 Enterprise Drive, Suite 303
Shelton, CT 06484 USA
Phone: +1 203-336-7900
Support: 1-800-243-2206 (IN THE U.S.)

TECHNICAL BULLETIN 110

D. Testing Procedure

1. Apply a thin layer of mold release agent to the inside of the mold.
   ***Do not use to excess**, which may change the shape of the cubes and affect strength.*

2. Carefully fill the cube mold halfway with the epoxy sample.
   Be careful not to mix mold release material into epoxy sample.

3. Consolidate epoxy cube specimens using one of two methods:

   a. **Method 1**: Follow ASTM C109 tamping procedure for consolidation of first layer. Then fill mold full of epoxy grout and consolidate per ASTM C109 tamping procedure into first layer.

   b. **Method 2**: Using a small spatula or tongue depressor, consolidate first layer by cutting/stabbing into grout and pulling material towards mold wall (5) times for each mold face. Then fill the mold full and consolidate similarly, ensuring strokes progress from the top layer into the bottom.

4. Top off molds to ensure they are filled to a slight excess, if needed.

5. Screed the surface from the middle of the mold to the outside with an ASTM C109 tamper or a tongue depressor/spatula in the wide, flat, horizonal position. Remove any excess epoxy grout using a sawing motion while lightly pressing down to remove air. Repeatedly remove excess epoxy until the surface of the epoxy grout is flush with the top of the mold or has a slight crown. Then repeat this step from the middle of the mold to the outside in the opposite direction.

6. Clean off any excess material on the top of the mold.

7. Finished molds should be kept in an environmentally controlled box between 69 - 77 °F (21 - 25 °C) and this box should be kept where the samples were made. *Avoid moving the mold samples once prepared.*

8. Record the product name, batch code, aggregate amount, start time, test date and temperature for each sample.

9. De-mold cubes after 24 hours and test one cube. The 2nd cube is tested at 7 days, and the 3rd is held as a retained sample or can be tested at 28 days or post cure. Sample should be maintained at the ASTM C579 standard of 69 - 77 °F (21 - 25 °C).

10. Prior to testing, file off any sharp edges on the cubes to eliminate surface imperfections. Such imperfections may affect compressive strength results.

11. Record the weight of each sample.

12. Before testing a cube each time, ensure load blocks are clean and free of debris.

13. When placing a cube in the compression tester, remember:

    - Do not apply load to the original top or bottom cube surfaces. Rotate the cube 90°. Only apply load to the side faces.

    - Ensure that the cube is well centered between the plates, with a corner – not flat side – pointed toward you.

14. Record the compressive strength in pounds per square inch by dividing the load at failure by the cross-sectional area. CS = F ÷ A, where CS is the compressive strength, F is the force or load at point of failure and A is the initial cross-sectional surface area.
    For more information, refer to ASTM C579 B.

D.3. Fill molds with second layer of epoxy grout, then consolidate to remove entrapped air.

D.5. Screed off excess grout.

FIVE STAR PRODUCTS, INC.
2 Enterprise Drive, Suite 303
Shelton, CT 06484 USA
Phone: +1 203-336-7900
Support: 1-800-243-2206 (IN THE U.S.)