

Implementation for approval of adhesive anchors to be placed on MassDOT's QCML

Effective immediately, manufacturers seeking placement on MassDOT's Qualified Construction Materials List (QCML) for approval of adhesive anchors must submit the following for review by MassDOT:

- All material documentation shall be separately submitted for approval for use on threaded rod or reinforcing bar applications.
- Materials shall be certified per ICC-ES AC308 cracked and uncracked concrete testing with the following additional criteria:
 - Materials must also be certified per optional testing for "sensitivity to freeze/thaw conditions" and "sensitivity to installation direction."
 - Materials shall provide a maximum Coefficient of Variation (COV) for short-term "reference testing" performed as part of the ICC-ES AC308 certification. Results from "reference testing" and COV shall be provided by the manufacturer to MassDOT as part of the materials approval process.
 - When applicable per ICC-ES AC308, "tension at decreased installation temperature" ICC-ES AC308 certification results shall not decrease by more than 10% from "reference testing." Materials shall have a maximum COV of 10% for "tension at decreased installation temperature" test results. Results verifying the comparison and coefficient of variation shall be provided by the manufacturer to MassDOT as part of the materials approval process.
 - When providing anchor capacity data for use in design, the Manufacturer shall provide the factors of safety referenced to the ICC-ES AC308 certified "reference testing" results. All results shall be referenced to Load and Resistance Factor design criteria.

- Manufacturer shall submit test data from an additional 5 tests. Testing shall be similar to “reference testing” with the following exception. After curing, test specimens shall be conditioned and tested at ambient temperature of 0°F (-18°C). Specimens shall be conditioned at the test temperature for a minimum of 24 hours prior to testing. Results shall not decrease by more than 10% from “reference testing.” Materials shall have a maximum COV of 10% for these reduced temperature test results. Results verifying the comparison and coefficient of variation shall be provided by the manufacturer to MassDOT as part of the materials approval process.
- Manufacturer shall provide data (value and plot of heat flow versus temperature) certifying the glass transition temperature from the initial cycle of Differential Scanning Calorimetry (DSC) testing (ASTM E1356-08(2014)). No initial thermal program or pre-treatment of the specimen is allowable (section 10.2 is NOT appropriate). Material shall exhibit a minimum T_m of 125°F (52°C) and T_f of 120°F (49°C). Any signs of material thermal degradation shall be reported and not occur at temperatures less than 125°F (52°C). Samples shall be cured at ambient conditions of 70-80°F (21-27°C) for a period not to exceed 7 days prior to DSC testing.
- Manufacturer shall submit results from Fourier Transform Infrared Spectroscopy (FTIR) testing of a sample disk of cured adhesive material for use as reference data for comparison to as-delivered products. Specimen thickness shall be 0.03-0.05 in. (0.8-1.3 mm). Specimens shall be cured and maintained at a constant ambient temperature of 74°F (23°C) prior to testing. FTIR testing shall occur at 7 days from initiation of cure. Updated data shall be submitted annually for the current batch of the material in order to maintain acceptance on MassDOT’s Qualified Construction Materials List.

Approved materials which will be on MassDOT’s QCML may only be used in permitted structural applications as defined by MassDOT Engineering Directive E-10-001 “Guideline for the approval and use of Adhesive Anchors”.