

The Standard Specification, Series 4151.02 B, is amended by the following modifications and additions. These modifications and additions allow for the use of Type B dowels comprised of a single uncoated non-metallic material, glass fiber reinforced polymer (GFRP). Type B dowels shall only be used in load transfer assemblies for CD joints on non-interstate primary PCC pavements with 20-year design truck traffic of less than 1,000 per day, as approved by the Engineer.

1. The processing facilities of the manufacturer/fabricator shall be open to inspection during manufacture and fabrication.
2. For initial approval, the manufacturer/fabricator shall be responsible for submitting dowels to a laboratory approved by the Iowa DOT for physical testing. The cost of the dowels and testing shall be the responsibility of the manufacturer/fabricator. Upon completion of testing all test results shall be certified by the laboratory and provided directly to the Iowa DOT.
3. For initial approval, dowels shall be comprised of a single nonmetallic material meeting the following requirements:
 - a. Glass fiber content greater than 70%, per ASTM D2584
 - b. Glass transition midpoint temperature ≥ 212 °F, per ASTM E1356
 - c. Long term absorption at 122°F $\leq 1.0\%$, per ASTM D570
 - d. Transverse shear strength $\geq 19\,000$ psi, per ASTM D7617
 - e. Mean tensile modulus of elasticity $\geq 6,500,000$ psi ASTM D7205
 - f. Ends of cut dowels shall not be deformed and free of burrs and projections
 - g. Uncoated diameter measured at both ends and third points with the average not to exceed $- 1/16''$ of the value shown in Iowa DOT PV 101
 - h. Uncoated length measured end to end not to exceed $\pm 1/4''$ of the value shown in Iowa DOT PV 101
 - i. Submit structural adequacy testing according to Annex A of ACPA T253 PTM No. 642 showing a maximum Linear Variable Differential Transformers (LVDT) differential deflection for dynamic loading. The average approach and leave section deflections shall not be more than 7.5 mils at 1 million cycles and shall not increase by more than 3.5 at 10 million cycles.
4. Dowels shall be coated with a bond-breaker as described in 4151.02 B 5 unless the manufacturer/fabricator can demonstrate that dowel pull-out forces, when tested in accordance with the provisions of Section 6 ACPA T 253-21 (no salt/freeze exposure), do not exceed 3,000 lbs for any specimen, and no specimen shall show any surface tears or perforation due to the pullout testing.
5. Protect dowels in dowel assemblies stored outdoors, longer than 90 days either at fabricator or project site, from UV exposure with a suitable tarp/covering. Record on an identification tag the date dowel assemblies were placed outdoors. Store dowel assemblies off the ground on pavement or wood supports. When stacking is necessary, place wood supports between assemblies or other method to ensure a stable stack.
6. Dowel bar baskets shall meet the requirements of Iowa DOT PV 101 with the dowels being friction fit or clipped to ensure they are secure and stable to prevent misalignment during handling and placement.
7. The manufacturer/fabricator shall perform quality control testing according to ASTM D7957 Table 2 for items 3a through 3h above and submit results to the Iowa DOT annually.