

## Position Statement #6

# Division 3 versus Division 9 Floor Flatness Tolerances

**D**ivision 3 specifications for concrete floor flatness typically include  $F_f$  requirements. The specifications also require that floor tolerance measurements be taken in accordance with ASTM E 1155-96, "Standard Test Method for Determining  $F_f$  Floor Flatness and  $F_L$  Floor Levelness Numbers." Thus, the F-number measurements for meeting Division 3 requirements incorporate the following:

- Point elevations measured at regular 12 in. (300 mm) intervals along each line;
- Measurement lines distributed uniformly across the test section;
- Minimum number of readings required for statistical approach;
- Measurement lines not within 2 ft (0.6 m) of any slab boundary, construction joint, isolation joint, block-out, penetration, or other similar discontinuity; and
- Flatness measured within 72 h of concrete placement.

Division 9 specifications for concrete floors to receive a floor covering typically provide floor flatness requirements in terms of an allowable gap under an unleveled straightedge. There is no ASTM procedure for this measurement. Straightedge measurements for Division 9 incorporate the following:

- Continuous measurement at any gap under the straightedge;
- Indefinite number of straightedge locations on the floor;
- No minimum or maximum number of readings;
- Measurements typically made with the straightedge crossing construction joints or column block-outs, and near penetrations; and
- Measurements made just prior to floor covering installation, which can be from 4 to 18 months after concrete placement.

Division 3 and 9 floor flatness tolerances are obviously not compatible. There is only a rough correlation between  $F_f$  numbers and the gap under a straightedge. F-number measurements don't include flatness variations indicated by straightedges placed across construction joints and column block-outs. And floor flatness changes with time (due to curling) make it impossible to predict the flatness when floor coverings are installed, based on  $F_f$  measurements made soon after concrete placement.

Despite this incompatibility of tolerance-measuring methods, some specifiers believe concrete contractors should be responsible for taking corrective action when Division 9 floor flatness requirements aren't met. To further complicate this issue, concrete contractors seldom receive Division 9 specification requirements when bidding. The floor covering often isn't chosen—and Division 9 isn't written—until after the concrete contract is signed, and sometimes until after the concrete is placed.

Concrete contractors are responsible for meeting the requirements of Division 3 specifications for floor flatness. To minimize the adverse effect of curling on floor flatness, ASCC contractors suggest that the engineer consider using No. 4 or 5 bars at 12 to 18 in. (300 to 450 mm) centers, depending on slab thickness. Alternatively, the owner could provide a bid allowance to the floor covering contractor for any necessary grinding and patching. Providing an allowance enables the owner to compare floor covering bids on an equal basis. If all the allowance isn't used, the money is returned to the owner.

If you have any questions, contact your ASCC concrete contractor or the ASCC Technical Hotline at (800) 331-0668.

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This position statement from the American Society of Concrete Contractors is presented for reader interest by the editors. The opinions expressed are not necessarily those of the American Concrete Institute. Reader comment is invited.

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