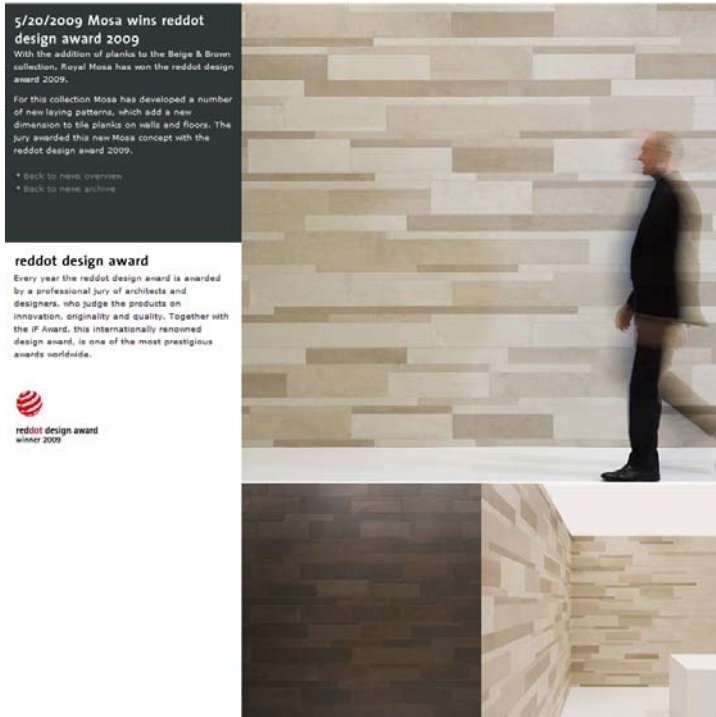


CONESTOGATILE
SpecBlazer
 ARCHITECTURAL NEWSLETTER

Royal Mosa Wins Reddot Design Award



With the addition of planks to the Beige & Brown collection, Royal Mosa has won the reddot design award. For this collection Mosa has developed a number of new laying patterns, which add a new dimension to tile planks on walls and floors. The jury awarded this new Mosa concept with the reddot design award.

<http://www.mosa.nl/us/news/losse-nieuwspaginas/mosa-wins-reddot-design-award-2009.aspx>

Every year the reddot design award is awarded by a professional jury of architects and designers, who judge the products on innovation, originality and quality. Together with the IF Award, this internationally renowned design award, is one of the most prestigious awards worldwide

Stonepeak's Cesare Magnus wins Coverings 2010 Select!

StonePeak's Cesare Magnus collection wins Coverings Select, a selection of the hottest new products introduced to both the US and the International markets since the close of Coverings 2009. Cesare Magnus was presented by the company during Surfaces show in Las Vegas last January 2010 and immediately caught the eye of the attendees for its beauty and amazing natural looks achieved through the innovative inkjet technology. Since its introduction to the market the interest in the collection has kept growing until yesterday, when StonePeak received the much appreciated news of the well deserved win.



<http://www.stonepeakceramics.com/news.php?view=76>

Florida Tile Commercial Initiative Announcement



Florida Tile announces the official launch of the Florida Tile Commercial Division. The development of the US commercial market is a strategic initiative to gain market share and ensure the flexibility and stability of Florida Tile through diversification.

<http://architects-designers.floridatile.com/news/commercial-initiative-announcement>

With the unprecedented updates to Florida Tile's product portfolio; the Commercial Division will rely heavily on the new technical production capabilities of its domestic manufacturing facility. Combined with the Florida Tile CARES initiative for environmental responsibility and our GREENGUARD certifications, Florida Tile now has a complete package to present to commercial specifiers. To stay competitive however Florida Tile will continue to develop new lines that are both aesthetically and technically appealing to the market.

Florida Tile will soon be introducing a new architectural representative, Tim Naiuri, who along with Conestoga Tile's architectural representatives; Howard Pryor, Jake Burkholder, & Nicole Khan will be contacting you soon with new exciting

updated merchandising folders, featuring their state of the art "**high definition**" porcelain tiles. All of Florida Tile's products have received the coveted **Green Guard** certification, recognized by the United States Green Building Council as contributing to LEED points.

Upcoming Changes to 2011 TCNA Handbook

Conestoga's Director of Architectural services, Howard L. Pryor CCS, CTC, CCTS represent the Construction Specification Institute (CSI) on the Tile Council of North America's (TCNA) board. Howard recently attended a conference in Atlanta, GA where the entire membership convened to vote on the new upcoming changes for the 2011 edition of the TCNA Handbook. Here are a few changes you can look forward to seeing:

Environmental Classifications: classifications describing use of tiles are assigned to individual methods and are referenced as guidelines only and are not meant to be all inclusive. The specifier should base their installation method selection on actual exposure levels, and consult with product manufacturers and their specifications. See the attached descriptions that will be included in the new 2011 Handbook edition.

There will be an increased emphasis on **Substrate Flatness:** Mortar bed and cementitious self-leveling details are "for areas where flatness is critical such as when tiles with any edge longer than 15" are specified or where accessibility is a concern." New tolerance for thin-bed methods: 1/4" in 10' and 1/16" in 1' for tiles 12x12 and smaller. For tiles with any edge longer than 12", max. variation no more than 1/16" per length.... See the following article by Dave Stutzman of Conspectus Inc. More information will follow in future SpecBlazer articles.

ENVIRONMENTAL CLASSIFICATIONS

The end user significantly affects the amount of water and vapor an installation will be exposed to. Examples provided below and the classifications assigned to the individual methods are guidelines only and are not meant to be all inclusive. Base installation method selection on actual exposure levels, and consult with product manufacturers and their specifications.

Res1 (Residential Dry)

Tile surfaces that will not be exposed to moisture or liquid, except for cleaning purposes. Includes areas adjacent to R2 areas. Examples: Floors in rooms with no direct access to the outdoors and no wet utility function, such as living rooms, dining rooms, and bedrooms; dry area ceilings, soffits, decorative/accent walls, fireplaces, some backsplashes and some wainscots.

Res2 (Residential Limited Water Exposure)

Tile surfaces that are subjected to moisture or liquids but do not become soaked or saturated due to the system design or time exposure. Includes areas adjacent to R3 areas. Examples: Floors in bathrooms, kitchens, mudrooms, laundry, and foyers, where water exposure is limited and/or water is removed; some backsplashes, some wainscots, some countertops

Res3 (Residential Wet)

Tile surfaces that are soaked, saturated, or regularly and frequently subjected to moisture or liquids. Examples: Shower floors; floors and other horizontal surfaces where water is not removed or drained, such as some countertops; tub walls and shower walls.

Res4 (Residential High Humidity, Heavy Moisture Exposure)

Tile surfaces that are subject to continuous high humidity or heavy moisture exposure. Examples: Intermittent-use steam shower walls, ceilings, and floors; enclosed pool area walls.

Res5 (Residential High Temperature $\geq 125^{\circ}\text{F}$)

Tile surfaces frequently subjected to water or vapor equal to or greater than 125°F. Examples: furnace and boiler areas.

Res6 (Residential Exterior)

Tile surfaces exposed to exterior conditions. When designing such installations, consider local climate and conditions including temperature and temperature fluctuations, humidity and humidity fluctuations, and freeze/thaw cycling. Examples: Exterior walls, balconies, decks.

Com1 (Commercial Dry)

Tile surfaces that will not be exposed to moisture or liquid, except for cleaning purposes. Commercial cleaning and maintenance practices typically generate greater water exposure than residential practices. Includes areas adjacent to C2 areas. Examples: Floors in areas with no direct access to the outdoors and no wet utility function, such as hallways; dry area ceilings; soffits; decorative/accent walls; corridor walls.

Com2 (Commercial Limited Water Exposure)

Tile surfaces that are subjected to moisture or liquids but do not become soaked or saturated due to the system design or time exposure. Includes areas adjacent to C3 areas. Examples: Floors in bathrooms and locker rooms; some backsplashes and other walls, such as bathroom walls and wainscots where water exposure is limited and/or water is removed.

Com3 (Commercial Wet)

Tile surfaces that are soaked, saturated, or regularly and frequently subjected to moisture or liquids. Includes areas adjacent to C4 areas. Examples: Tub walls, shower walls and floors (not including gang showers), and some commercial kitchen floors and walls.

Com4 (Commercial High Humidity, Heavy Moisture Exposure)

Tile surfaces that are subject to continuous high humidity or heavy moisture exposure, especially in enclosed areas. Examples: Continuous use steam shower/steam room walls and ceilings, enclosed pool areas, natatoriums, gang showers.

Com5 (Commercial High Temperature $\geq 125^{\circ}\text{F}$)

Tile surfaces that are frequently subjected to water or vapor equal to or greater than 125°F. Examples: Commercial saunas, furnace and boiler areas, and some commercial kitchen floors and walls.

Com6 (Commercial Exterior)

Tile surfaces exposed to exterior conditions. When designing such installations, consider local climate and conditions including temperature and temperature fluctuations, humidity and humidity fluctuations, and freeze/thaw cycling. Examples: Exterior walls, balconies, decks.

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ABSTRACT:

Ensure concrete finishing specifications include all the information required for floor slab tolerances. Specifying single values for flatness and levelness may result in ambiguous requirements. F-Number and straightedge methods require two sets of values to ensure the expected results are clearly stated.

FILING:

UniFormat™

A1030 - Slab on Grade

B1010 - Floor Construction

MasterFormat™

03 30 00 - Cast-In-Place Concrete

KEYWORDS:

Flatness, Levelness, F-Numbers, Straightedge, Specified overall values, Minimum local values, Allen Face

REFERENCES:

ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials

ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers

ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric)

FLOOR SLAB FLATNESS & LEVELNESS

By David Stutzman, AIA, CSI, CCS, SCIP, LEED AP

Background

Traditionally allowable tolerances of concrete floor slabs were determined by checking the slab surface with a 10 foot straightedge. Common tolerances were 1/8 inch or 1/4 inch in 10 feet.

The fallacy of the straightedge method was the location of the measurement. Depending on where the measurement was made, the slab may pass or fail the specified tolerance. Until recently, no standard procedure existed for taking straightedge measurements.

In 1979 Allen Face introduced the Face Floor Profile Numbering System (F-Numbers) to remove the ambiguity of measuring floor flatness and levelness. F-Numbers use dimensionless symbols to designate flatness and levelness. F-Numbers formalized in 1987 by ASTM E1155 and ASTM E1155M were adopted by the American Concrete Institute as the standard for specifying floor tolerances in 1990 in ACI 117.

- F_F Floor Flatness - variation from surface plane (bumpiness)
- F_L Floor Levelness - variation from horizontal plane (pitch)

Specifications referencing ACI 117 for tolerances may rely on F-Numbers or manual straightedge methods to determine floor slab tolerances for random traffic pattern floors which are typical for most uses. However straightedge measurements are not permitted for very flat and super flat floors.

When defined traffic patterns exist such as for narrow aisle and automated warehouses special consideration must be given to concrete placement and tolerance measurements. These conditions are not addressed by ACI 117.

F-Number Method

The ASTM standard, in place for two decades, establishes the method for measuring F-Numbers. The method uses a statistical analysis of measured points 12 inches apart taken along straight lines in a prescribed pattern within each sample panel. Each sample panel must exceed 320 sf, must be at least 8 ft. wide, and must not cross a construction joint.

The ACI standard sets recommended F-Number tolerances for various concrete floor slab construction qualities. To specify F-Numbers correctly, two values are required for flatness and levelness:

- Specified Overall (SOF_F and SOF_L)
- Minimum Local (MLF_F and MLF_L)

Floor Surface Classification	SOF_F	SOF_L
Conventional	20	15
Moderately Flat	25	20
Flat	35	25
Very Flat	45	35
Super Flat	60	40

F-Numbers must be measured within 72 hours of placing the slab. This ensures that the F-Numbers are measuring the concrete contractor's quality. If the

measurements are delayed, shrinkage, curling, and other factors outside the concrete contractor's control can influence the results.

Levelness tolerances apply only to slabs-on-grade and suspended slabs that are shored when tested. Levelness tolerances do not apply to sloped or cambered floors.

ACI 117 sets the Minimum Local values at 60% of the Specified Overall values, unless specified otherwise. The Minimum Local values are the minimum tolerances for the floor to be usable. Defects exceeding the Minimum Local values normally require grinding, filling, or replacement to correct the defect.

For a slab to be acceptable, the cumulative Overall Values for the entire slab must meet or exceed the Specified Overall values, and all locations must meet or exceed the Minimum Local values.

Straightedge Method

In the June 2010 edition of ACI 117, the straightedge method description was greatly expanded. Now the standard establishes a procedure for measuring flatness with a straightedge. Note that levelness cannot be determined with a straightedge. ACI 117 sets minimum sampling requirements to help ensure a statistically representative set of measurements. One sample must be taken for every 100 sf of floor area. Samples must be taken parallel, perpendicular, or at a 45 degree angle to the longest construction joint of the test area.

The following chart shows the maximum gap between the floor surface and the bottom of the 10 foot straightedge. Note that

90% of the samples must not exceed column 2 and 100% of the samples must not exceed column 3 of the table below.

Floor Surface Classification	Maximum Gap	
	90% Compliance	100% Compliance
Conventional	1/2 inch	3/4 inch
Moderately Flat	3/8 inch	5/8 inch
Flat	1/4 inch	3/8 inch
Very Flat	N/A	N/A
Super Flat	N/A	N/A

The familiar 1/8 inch in 10 feet tolerance is not an option with ACI 117. This may present difficulties for specifying slab tolerances for applied floor finishes, such as wood strip flooring. Some floor finish manufacturers require more stringent tolerances than can be tested using the straightedge method. Consult the finish flooring manufacturer's instructions for acceptable substrate surfaces.

Floor Classifications

The floor classifications above are for random traffic patterns. More stringent tolerances require additional straightening operations, time, and cost to ensure compliance. Very flat and super flat floors require specialized equipment and specially trained mechanics to achieve the results.

Conventional floors are not suitable for applied finishes. These floors are used for utility spaces and are usually left exposed.

Moderately flat floors are suitable for carpeted finishes in commercial buildings and low speed vehicular traffic in industrial buildings.

Flat floors are suitable for thin set ceramic tile, vinyl tile and similar finishes and for conventional fork truck traffic in warehouses. Flat floor classification is the most stringent tolerance that should be expected for suspended slabs.

Very flat floors are usually restricted to high-end industrial applications where high speed fork trucks and other high-production equipment are used.

Super flat floors are appropriate for very limited applications with random traffic such as television production studios to minimize camera vibration.

Specification Tip

Select the method: F-Number or manual straightedge. Reference ACI 117 for tolerance compliance.

Allen Face provides an F-Number [sample specification](#). Include the minimum Specified Overall and the Minimum Local values for both flatness and levelness.

For the manual straightedge method, specify the maximum gap for 90% and 100% compliance.



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