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## ASTM F-710, Does the Subfloor Need to be THAT Flat?

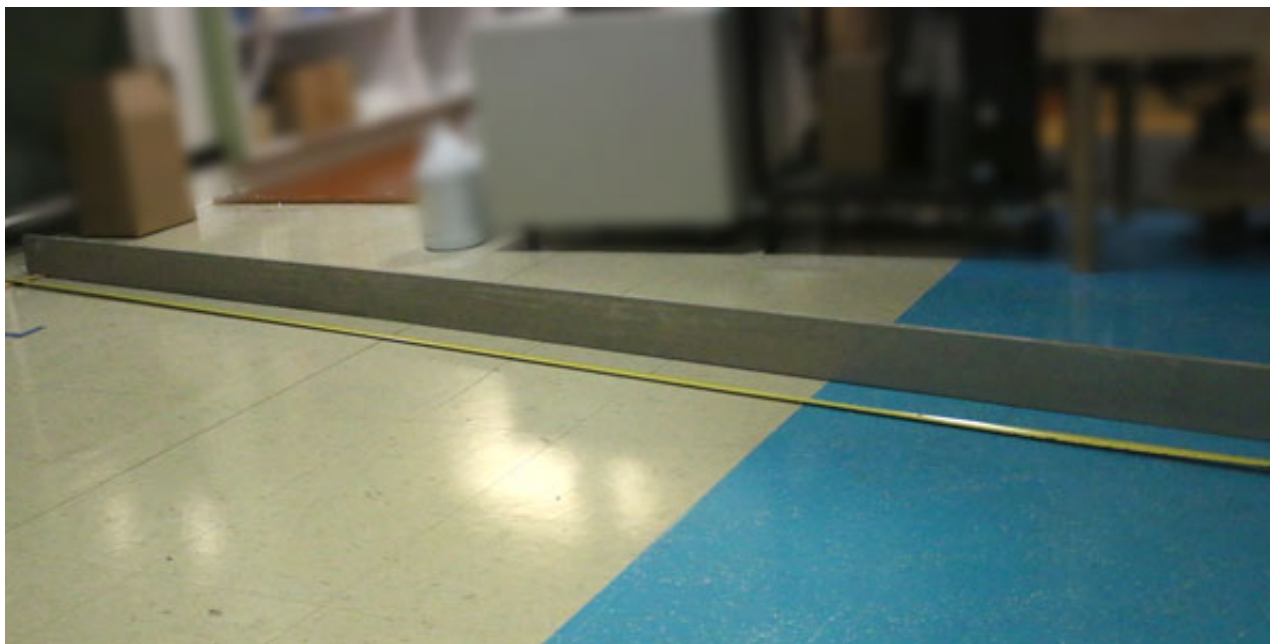
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Reggie Hill

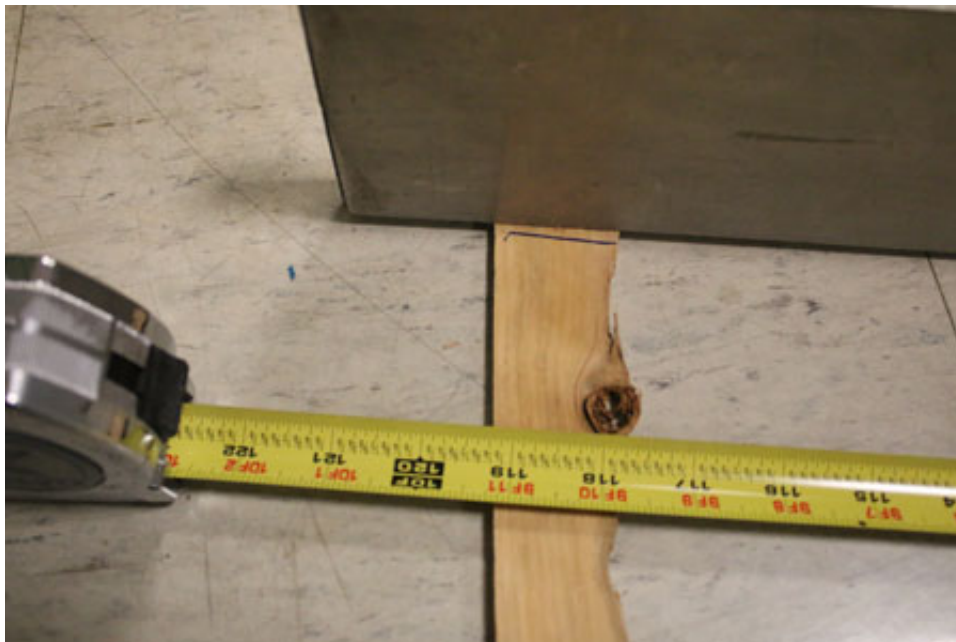
Reggie's Floor Stories™, Resilient Floors, Trouble Shooting, Flooring Installation



Installation instructions, from most major flooring manufacturers, reference ASTM Standard F-710 for hard surface resilient flooring. The Standard simply defines the required flatness of a concrete subfloor. The subfloor, or 'underfloor' as I like to call it, "shall not deviate more than 3/16 of an inch in ten feet." **Photo 1** shows a ten foot straight edge being used to gauge the undulation of the floor. **Photo 2** demonstrates the maximum allowable deviation- 3/16 of an inch within 10 lineal feet- with a mark on the shim shingle below the straight edge.



*Photo 1: 10-foot Straight-edge used to gauge flatness of floor.*

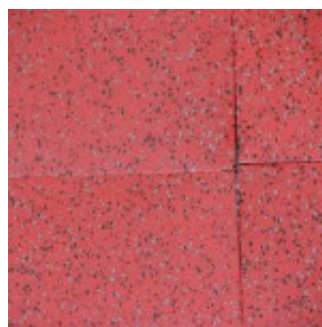


*Photo 2: Plywood shim replicates maximum acceptable 3/16" deviation in height.*

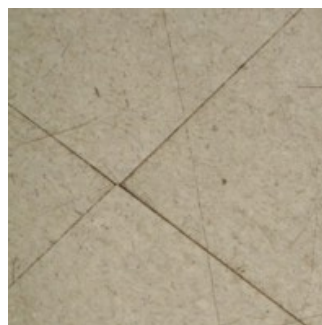
ASTM Standard F710 is a straight forward rule however a quick audit of hard-surface flooring installations indicates that most installers do not provide provisions to accommodate this ASTM standard during installation. The result can be seen in **Photos 3, 4 and 5.**



*Photo 3: VCT run off and gaps at joints.*



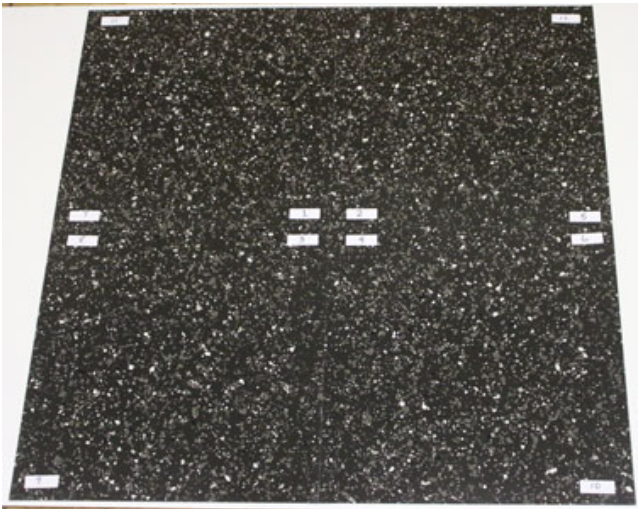
*Photo 4: Rubber floor tile run-off, gapping at seams.*



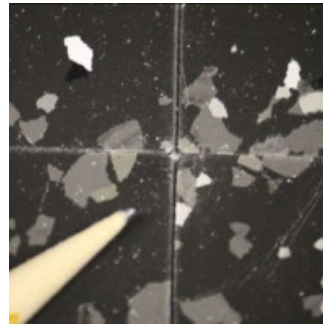
*Photo 5: Flooring tile with severe runoff.*

In order to simulate the outcome of resilient flooring tiles installed over a flat subfloor that complies with ASTM F710, I set up, labeled and outlined in pencil, a group of four tiles over a flat subfloor surface as shown in **photo 6.** To

demonstrate what happens when there is a hump in the concrete sub floor, I placed a 3-and-one-half inch bump under the 2x2 foot floor tiles. **Photo 7** shows that the joints are no longer tight and **photo 8** reveals a deviation from a net fit where the uneven subfloor caused the tile pattern to pull away from square. When this happens across the span of a room, cutting tiles and increasing or skewing joint lines is necessary to counteract the runoff caused by an unprepared underfloor. This is often an eyesore and results in claims and complaints from customers to the company that makes the flooring.



*Photo 6: Set up of 4 tiles laid on a flat subfloor with tight joints and the perimeter traced.*



*Photo 7: After simulating bump in subfloor, evident opening at joints.*



*Photo 8: With 3-1/2" subfloor deviation, tile alignment shifts drastically.*

As you can see in **Photo 9**, when the floor meets the Standard set by ASTM F710, the modular flooring is not defective as it visually provides an acceptable finished appearance -that the manufacturer had envisioned when designing, engineering

and manufacturing the flooring- with tight joints and straight lines between flooring tiles.

**Photo 10** discloses the immediate problems created when a floor does not comply with this Standard due to a severe hump in the underfloor. Close inspection of the photograph reveals modular components that veer to the left and to the right making it impossible to navigate the hump without gaps and misaligned corners. Even the best flooring installer cannot overcome severe undulation unless they even out the problem areas of the subfloor prior to laying the floor tiles.

The bottom line...installed floors that do not conform to ASTM Standard F 710 are not a manufacturing defect, they are the direct result of poor workmanship or failure to follow the flooring manufacturer's printed installation instructions. It is important to know that the smaller the format of the modular flooring, the more difficult and challenging it will become to install the flooring with tight net joints in both directions and without runoff. Often in severe situations, a flooring installer may be tempted to



*Photo 9: LVT installation meets ASTM-710 Standard for flat subfloor.*

make field cuts to modify the floor tiles, so that it is brought into what is perceived as alignment, but soon after cutting the challenge of installing with a net fit at the corners and joints is still impossible.



*Photo 10: Result of severe underfloor humps.*



Replacing a floor can be expensive... especially when the flooring manufacturer is not participating in the cost so take the time to resolve sub floor issues before flooring is installed

or you'll be left with a choice- rip up the just-installed floor in order to level the underfloor or live with an unattractive cut and paste job intended to conceal subfloor undulation that your flooring installer did not fix -it's your call.

With over 35 years of experience in the flooring industry, Reggie Hill, founder of Wilmington, DE based Floor Covering Services & Consultants, Inc. has developed an in-depth understanding of hard surface floors and the preparation, installation and post care required for successful hard surface flooring installations. Reggie stays involved in the flooring industry through his current business as president and co-owner of FCSC and several flooring-related companies that provide consulting services and floor care product sales to the industry and to end users. Consulting services include troubleshooting, expert witness, training and technical support. Floor care product sales provide specialized maintenance products and routine care products that meet the needs of consumers and industry partners via business to business and retail sales.

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