Installation of Ceramic or Stone Tile over Structural Lightweight Concrete

DATE

January 2022

RECOMMENDATION

Structural lightweight concrete is similar to normal-weight concrete except that it has a lower density. Installing tile over lightweight concrete (except for gypsum based underlayments) should be treated the same as installing over normal-weight concrete.

Install ceramic or stone tile using appropriate TEC® latex-modified thin set mortar such as Super Flex™ or 3N1™ Performance Mortar. For setting moisture sensitive stone tile or if chemical resistance is desired, use TEC® AccuColor EFX® Epoxy Grout and Mortar.

For installations over gypsum based underlayments see TEC Technical Bulletin "Installation of Ceramic or Stone Tile Over Gypsum Based Underlayments".

For any concrete substrate (normal-weight or lightweight) the following should be taken into account:

- The concrete floor must be adequate to withstand live and dead load with deflection not to exceed $^{L}/_{360}$ of span.
- Surfaces to be tiled shall be structurally sound, dry, free from oil, cracking, grease, dust, loose or peeling paint, concrete sealers or curing compounds. Any or all contaminates, if they exist, shall be removed prior to the installation of ceramic or stone tile.
- Maximum variation in the concrete shall not exceed $^{1}/_{4}$" in 10' and $^{1}/_{16}$" in 1' from the required plane.
- To minimize tile cracking due to typical concrete shrinkage, H.B. Fuller Construction Products Inc., the manufacturer of TEC brand products, suggests the use of one of the following crack isolation products:
  - TEC® HydraFlex™ Waterproofing/ Crack Isolation Membrane
  - TEC® Triple Flex™ Waterproofing/Crack Isolation Membrane & Mortar

Discussion

Structural lightweight concrete is sometimes questioned when being considered as an acceptable substrate for the installation of ceramic/stone tile. There are several different materials (e.g. gypsum based underlayments) that have been referred to as lightweight concrete. As stated earlier, structural lightweight concrete is very similar to normal-weight concrete except for its density. Structural Lightweight concrete is produced using lightweight aggregates or a combination of lightweight and normal-weight aggregates. Structural lightweight concrete air-dry density is in the range of 85 to 115 pcf and compressive strength in excess of 2500 psi after 28-day cure. Normal weight concrete containing regular sand, gravel, or crushed stone has a dry density of 130 to 155 pcf. Typical compressive strengths for structural lightweight concrete range from 3000 psi to 5000 psi. Structural lightweight concrete mixes can be designed to have the same workability, finishability, and general appearance of a properly designed normal-density concrete mix. Structural lightweight concrete is used primarily to reduce the dead-load weight in concrete members such as floors in high-rise buildings or condominiums.

Questions?

Call the Technical Support Hotline at 1-800-832-9023.

This Technical Bulletin has been prepared in good faith on the basis of information available at the time of publication. It is intended to provide users with information about and guidelines for the proper use and application of the covered TEC brand product(s) under normal environmental and working conditions. Because each project is different, H.B. Fuller Construction Products Inc. cannot be responsible for the consequences of variations in such conditions, or for unforeseen conditions.

Reference: Design and Control of Concrete Mixtures; Portland Cement Association (PCA)

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