Testing Standards for Tile and Stone Installation Materials

TDS 161

In the tile and stone industry, there are three *main* standards organizations that establish the testing criteria utilized by manufacturers of tile and stone installation materials. In no particular order, first is the American National Standards Institute (ANSI), which was founded in 1918 and has served in its capacity as administrator and coordinator of the United States private sector voluntary standardization system for more than 90 years (www.ansi.org). ANSI "materials" standards currently range from ANSI A118.1 through ANSI A118.15 and include ANSI A136.1. The second is the International Organization for Standardization (ISO), which was founded in 1947. It is the world's largest developer of International Standards (www.iso.org). ISO materials standards are defined in ISO 13007 (Refer to TDS 137ISO for more information on ISO classifications). The third is the European Committee for Standardization (CEN). European Standards, also commonly referred to as "Euro Norms" (EN), are a key component of the Single European Market and are crucial for facilitating trade. EN materials standards are defined in EN 12004, EN 13813, EN 13888, and EN 14891 (Refer to TDS 137EN for more information on ISO classifications).

Since the establishment of the ISO standards and Euro Norms, there have been debates amongst industry professionals as to which set of standards are more valid for testing tile and stone installation materials. There are, however, advantages provided by all of these standards. The ANSI shear bond methods more closely replicate the actual stresses that tile and stone installations will experience, once they are installed and in-service. This is primarily, because these installations do not experience pulling forces coming from directly above them. Instead, shear–type stresses are exerted on adhered installations, by three (3) primary factors; thermal expansion and contraction, pedestrian and vehicular traffic, and restrictive pressures put on them from being tightly abutted to restraining surfaces (e.g. floor tiles installed tightly up against walls and columns). If proper accommodation for expansion and contraction is not incorporated into the design, it can result in delaminated, or even tented tiles (see Figure 1). Refer to Tile Council of North America (TCNA) Handbook method EJ171, Terrazzo, Tile, and Marble Association of Canada (TTMAC) method 301MJ, for comprehensive industry guidelines for movement joint design and placement in tile and stone installations.

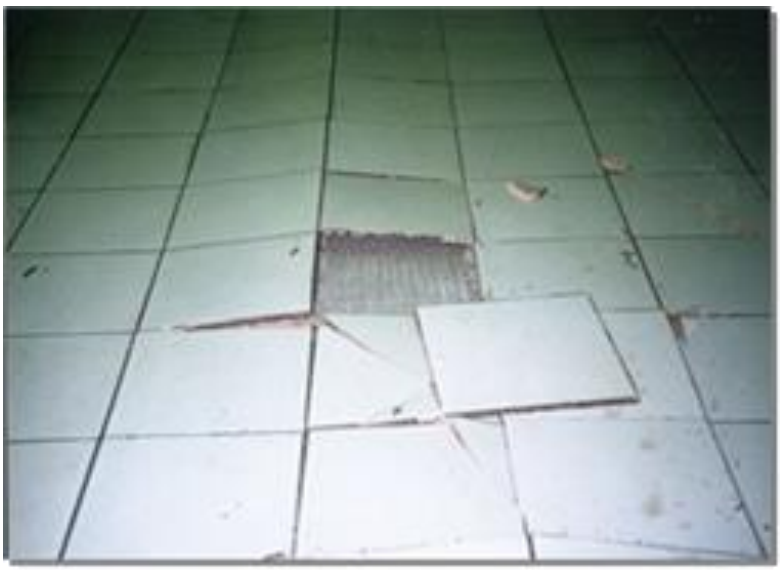

Figure 1

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For cement-based tile adhesives, ISO 13007 and EN 12004 utilize tensile-pull testing. There are no requirements for shear bond testing in either the ISO or EN standards. However, ISO 13007 classifies tile and stone installation materials into categories, based on material type and performance level. For example, ANSI classifies cementitious adhesives into two basic categories; *standard-performance* mortars (ANSI A118.4) and *improved-performance* mortars (ANSI A118.15). However, ISO 13007 contains additional requirements for defining *optional characteristics*, such as fast-setting (F), slip-resistant (T), extended open time (E), normal and improved deformability (S1 & S2), and normal and improved adhesion to exterior –grade plywood (P1 & P2). It also contains the grout-specific classifications, high-abrasion resistance (A) and reduced water absorption (W). These additional classifications help Project Specifiers more clearly define the types of installation materials in the project specification and ensure that contractors are basing their bids on equally-performing materials. This, in turn, helps ensure that Project Owners are, indeed, receiving finished installations that comply with design intent set forth in the project specification.

The standards established by all three organizations are necessary and vital for project participants to understand. The key is that the type and performance of each installation material, and system assembly, be evaluated based on the project specific needs and budget.

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