



The Space Between: A Close Look at Grout Standards

From Newton's physics to Einstein's, the way we view the world changes through new scientific paradigms. These shifts happen continually. This month, we are talking about shifts in our understanding of tile grout properties, testing, and standards.

In North America, ANSI grout standards are well known, recognized, and relied upon by designers, distributors and contractors alike. Contrasting this, few tile suppliers today are familiar with ISO grout specifications. In the next few years though, most will be. The ISO standards for grouts and mortars are becoming more widespread, so anyone who has an interest in staying current will want to be familiar with these standards.

As noted in a previous Q&A article, there are ANSI and ISO standards for grouts and mortars: Parts 1 and 2 of the ISO 13007 standard pertain to the specifications and tests for tile thin-set mortars (called adhesives in the ISO standard), and parts 3 and 4 of the same standard pertain to the specifications and tests for grouts. Under both sets of standards, grouts are tested principally for compression, flexibility, shrinkage, and water absorption, although differences exist in how the tests are run and the specifications for acceptable performance.

In fact, the ISO and ANSI grout standards are not intended to correlate, just as the ISO and ANSI specifications for thin-set mortars cannot be directly correlated. In 2011, the TCA Handbook will list both ISO and ANSI mortar and grout specifications in every method so either system of classification can be used.

Where Do These Standards Come From?

Standards used to classify products are always evolving to allow for innovations in the market. Similar in process to the

development of standards for other construction materials, grout standards are developed by various people involved from all across the industry. People come together to discuss and determine the best way to test and define different aspects of a material, depending on different perspectives and areas of expertise. Through this process, a democratically developed conception of a building material emerges, with the best interests of the relevant parties in mind.

With tile grouts, the ISO specification separates cementitious grouts from reaction resin (or epoxy) grouts, while the ANSI specifications divide grouts into five categories: A118.6 cement grouts, A118.7 polymer modified cement grouts, A118.3 epoxy grouts, A118.5 furan grouts and A118.8 modified epoxy emulsion grouts. The ANSI standard also establishes a unique set of tests for each type of product.

Categories for grouts based on the ISO 13007 standard

CG- Cementitious Grout Designations

CG1-Normal cementitious grout

CG2-Improved cementitious grout, always accompanied with (A), (W), or both (AW)

A- High abrasion resistance

W- Reduced water absorption

CG1, CG2A, CG2W, and CG2AW grouts may also be accompanied with an (F)

F- Fast-setting

RG- Resin-Based Grout Designation

RG-Single designation for resin-based grout

Right: A simple breakdown of the different categories for grouts based on the ISO 13007 standard.

With the ISO standard, one set of tests differentiates grouts based on their performance. There are three further specifications for differentiating cementitious grouts within the ISO standard: High abrasion resistance (A), fast-setting (F), and reduced water absorption (W).

See a simple breakdown of the different categories for grouts based on the ISO 13007 standard in the adjacent chart.

Abrasion Resistance

The abrasion resistance test allows us to understand the durability of grouts in the field under different kinds of traffic. Grout installed under our feet takes a fair bit of wear and tear, so it is important to have a sense of how well the grout will stand up. The abrasion test is conducted by running sand over a cured sample of the grout. The amount of material lost gives an idea about the potential wear resistance of the grout.

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Fast Set

Of course, you know why fast set is important for a grout. It speeds up downtime, whether that is getting the flow of traffic back up to mach speed in the mall, or getting buckets and grout floats out of that homeowner's otherwise pristine kitchen. Under the ANSI standard, set times are tested using a penetration test. Once the grout becomes hard enough to resist penetration, the grout is considered set. With ISO, fast set is determined by the grout quickly developing the bulk of its compressive strength within 24 hours of being installed.

Reduced Water Absorption

Reduced water absorption becomes an issue for grouts when staining can occur. If a pool of morning coffee sits on a beautiful white grout for long enough, it will permeate that installation job and can ruin a tile countertop. Both ISO and ANSI expect grouts to be tested for water absorption.

With ANSI, grout samples are weighed before and after total immersion into water. With ISO, the samples are placed partially in water and weighed to see how much absorption has occurred by capillary action, or a soaking up of water. Both tests give an impression of the potential resistance to absorption by a grout in their own ways.

Resin Grouts

Resin grouts are differentiated from cementitious grouts in the ISO standard, a distinction also made under different ANSI standards. Epoxy grouts by nature outperform cement-based grouts for an added cost. If a spill occurs over a resin-based grout, there is virtually no absorption, and resin grouts are generally stronger and more durable as well.

What About Grout Properties not Evaluated by ANSI or ISO?

Two grout characteristics have emerged as increasingly important, but which are not currently referenced in ANSI or ISO grout standards: stain resistance and color consistency. "Stain-resistant" and "colorfast" grouts are now available from virtually every grout manufacturer, but without standardized testing, it is difficult to compare products in advance of their use.

In time, this will be rectified, as additional tests and specifications for grouts are already being considered.

What About Types of Grout not Considered by ANSI or ISO?

New types of grout will generally be the furthest behind the standards curve. For example, premixed polymer resin grout is widely available but without its own performance standard. When considering any product without a standard, the

manufacturer must be consulted for performance and application suitability and installation instructions. A job-specific written warranty should also be considered. When such products are used successfully, that success in turn helps pave the way for a standard to be developed.

What Happens Next?

Who knows where the development of standardization may head in the future? Whether new components are developed, new technologies discovered, or new understandings of the current technologies are delineated, standards will continue to evolve and help users and manufacturers define acceptable criteria. The philosopher Francis Bacon once wrote, "He that will not apply new remedies must expect new evils; for time is the greatest innovator." As new remedies, and new standards, continue to be developed, let us continue to look for the good they can do the industry and be open and expectant for the potential available with change. **TILE**



About the Author

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