

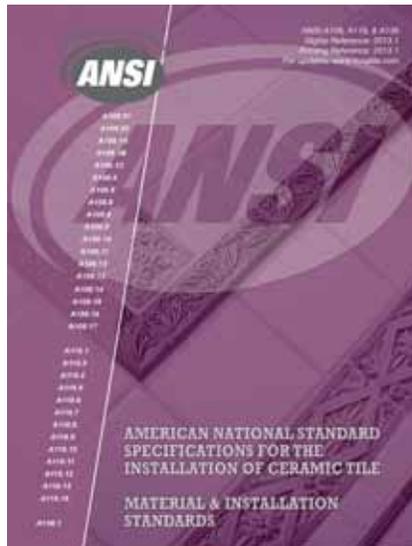
## Thinset or fruit drink?

The standards published by TCNA are consensus documents; they are the product of numerous individuals' input. This month's Spotlight on TCNA article on the new ANSI mortar standards is guest authored by an independent consultant and lifelong tile industry professional involved in standards development and whom TCNA calls on regularly for input and technical assistance on a wide range of topics.

by Dave Gobis

**S**trange title for a tile article, eh? As you may suspect, there is a reason behind my attention-getting efforts. The term thinset is used to describe a material used for direct bonding of tile to various substrates. It is generic in nature and means nothing more and nothing less. Fruit drink is also a generic term used to describe just that. But, if I said get me some Kool-Aid, your first thought would likely be which one of the 67 flavors I desired. If you were concerned about my girth, you might also ask whether to get the sugar or sugar-free version. Would you be surprised to know that there are actually 21 different Kool-Aid products, including ice cream and freezer pops? This analogy is very similar to thinset bonding mortars. Each manufacturer has numerous thinset products, and just as Kool-Aid products are made for eating or drinking, thinset mortars are made for bonding in just as many variations. I counted the thinset bonding materials available from several manufacturers. In one instance there were 19 products, and in another, there were 17. To add to the confusion, they all met the same standard — ANSI A118.4. So what is ANSI, and why should you care whether it is A118.4 or 118.75? I am going to try and tell you, because with the tile products we are installing today, you need to know.

First, for those that don't know what ANSI is or does, here is a brief description. The American National Standards



The new mortar standards will be published in the next edition of ANSI standards, available through TCNA.

Institute (ANSI) serves as the voice of the U.S. standards and conformity assessment system. The Institute was founded in 1918 and oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector. It is comprised of government agencies, organizations, companies, academic and international bodies, and individuals. ANSI is the official U.S. representative to the International Organization for Standardization (ISO). It is not controlled by any singular entity. ANSI (American National Standards

Institute) A108 has served as the standard for installation for many years. For setting materials, we use ANSI A118, and ceramic products fall under ANSI A-137.1. Recently standards were introduced for glass tile products, ANSI A 137.2. One of ANSI's requirements are that standards are revisited and re-approved every five years. Standards set minimum performance criteria for products. Using a product that meets standards obligates the manufacturer to warrant that it will meet the minimum requirements when so represented.

Thinset mortars were first patented in the 1950s through early 1960s. The original thinset mortar was called dryset, and it meant that you no longer had to soak tile prior to installation. It was formulated to bond absorbent tile to absorbent surfaces. A standard was established by 1959 for these early non-modified (no latex) thinset mortars, A118.1. Unfortunately then as now, many of the earlier users of dry thinset mortars were concerned with the immediate price only, and they used these products indiscriminately for all types of ceramic, including porcelain mosaics on suspended slabs. Their indiscriminate use soon led to many problems and complaints because the dry thinset mortar did not have inherent flexibility and was extremely rigid. It could not withstand deflection of the suspended concrete slab or physical shock. The number of problems with ceramic mosaics used on floors grew, and faulty installations on suspended



ANSI product and installation standards recommend a mortar setting bed thickness of  $\frac{3}{32}$  to  $\frac{1}{4}$  inch (nominal) and recommend against using thinset to flatten a substrate. This is especially important when setting glass tile, as an excessively thick setting bed will shrink as it dries, which can cause tiles to crack, particularly when the shrinkage is uneven due to variations in mortar application thickness (differential shrinkage).

concrete slabs became frequent. Soon, cautions were being issued restricting the use of dry Portland cement thinsets, in addition to frequently advising against undertaking certain difficult installations.

The industry turned to greater use of latex-modified thinsets that had been on the market since the 1950s following their introduction by Laticrete International. As more and more companies developed latex-modified mortars, the ANSI A118.4 Latex Modified Thinset Mortar standard was drafted in 1973. This standard does not recognize the range of modified thinset mortars, which can vary in bond strength by 300% or more; it only requires that minimum performance is met. The only other change in the last 40 years to thinset standards came in the 1980s, when it became apparent that a 118.4 thinset was not always suitable for directly bonding tile to plywood. The formulation was tweaked and a new standard, A118.11, The American National Standards for EGP (Exterior Glue) Plywood Latex Portland Cement Mortar, was born.

Things have come full circle since the original standards were developed. The problems that led to the development of

118.4 Latex Modified Mortar standards are being seen once again. These days, we seldom deal with mosaic tile nor the quarry tile, wall tile or absorbent floor tile, which is what the original A118.4 bonding product was designed for. At the time the original standards were created, anything over 8 x 8 inches was considered large format, a far cry from today's commonplace. Also gone are the overly rigid wood structures and thick slabs in concrete structures. They have been replaced by composite wood panels and highly engineered thin slabs on deck and grade to save time, money and the environment. Common tile sizes are now 18 or 24 inches and growing. There is a vast difference between bonding and in-depth engineering explanations to explain the exact reasons. Recognizing this, a new product standard has been developed, ANSI A118.15, American National Standard Specifications for Improved Modified Dry-Set Cement Mortar. This improved modified dryset tile-setting mortar is designed to improve adhesion, reduce water absorption and provide greater bond strength with more resistance to shock and impact than the

current 118.4 product. Optionally, there are two levels of deformation (how much it moves before it breaks) available. Like all standard thinset mortars, this one is also designed to be used as a setting bed (after the tile is embedded) of between  $\frac{3}{32}$  and  $\frac{1}{4}$  inch in thickness. And, as with all other thinset mortars, it is designed as a bonding adhesive and not intended to be used in truing or leveling of substrates. This is a high-performance product. It has double the shear strength requirement of the 118.4 product.

As tile products continue to evolve and materials to bond them are developed, we will continue to see new standards come into existence. On the horizon, medium-bed mortar standards allowing a bond coat of  $\frac{1}{4}$  to  $\frac{3}{4}$  inch. While many such products are currently available, standards development typically lags by a period of time until consensus is reached on just what realistic performance expectations should be. One thing is certain; there is nothing wrong with installing good old fashioned tile with good old fashioned materials. However, that old fashioned setting material may not be the best choice when installing the latest tile products. **TILE**

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## ABOUT THE AUTHOR



**David M. Gobis**, a third-generation tile setter, serves TCNA as an independent technical consultant. He has been in the trade for more than 40 years, many of them

as a successful tile contractor. Gobis has authored more than 150 trade-related articles and is a frequent speaker at industry events. He participates in standards development for numerous organizations and technical committees, including: the Construction Specifications Institute (CSI), the International Code Council (ICC), the American Concrete Institute (ACI), the National Tile Contractors Association (NTCA), the American National Standards Institute (ANSI) committee for ceramic tile installation and setting materials, the American Society for Testing and Materials (ASTM) C-21 committee for ceramic whitewares and the TCNA Handbook Committee. Gobis can be reached via email at: [dave@ceramictileconsultant.com](mailto:dave@ceramictileconsultant.com).

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