

# 093000 CONTRACTOR

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Artisan Tile and Marble Company of New Jersey, Inc.

## FEATURED INSIDE

Shear Bond Strength of Tile Assemblies

Heated Shower Floors: A Luxury Without Barriers

History of Gauged Porcelain Tile Panels: Where are we now?





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John Trendell  
Trendell Consulting LLC  
TCAA President

## THE SECRET TO SUCCESS?

*(There is no Secret)*

**T**wenty-four years ago, a book titled *Don't Sweat the Small Stuff and It's All Small Stuff*

was published regarding keeping life in perspective. Now I know that the last 15 months have not exactly been about small stuff, but it is still important to put things into perspective. I thought I would give my thoughts on what success, as a tile contractor, might mean.

**Perseverance:** I know that every endeavor that I pursued was not as successful as I might have wanted. But, at least for me, I still got up every day and pursued my goals. There were company goals and personal goals. All of these goals were intertwined with the goals of my customers, my employees, and my family and friends.

**Respect for People:** I know I might not be the easiest guy to get along with (ask my wife, Mary). But I have tried to give everyone the respect that every individual

deserves. Again, your customers, your employees, and your family and friends will appreciate that courtesy.

**The Golden Rule:** Fairness and honesty in all of our relationships with others, both personally and corporately, is absolutely imperative to success in life.

So, here we are, hopefully, coming out of a very, very rough period of time in everyone's life. As tile contractors we have experienced all the highs and lows of life just like everyone else. It is how we face these trials and challenges that defines us.

The secret to success? There, of course, are as many forms of success as there are people. To each of us, success is defined in a very personal way. But the three I have listed are what I use to measure my success.

Stay well everyone!

P.S. An addendum. (We all love addendums...NOT!)

**Stay Curious:** Keeping up with changes is essential to any business. I know it can take us out of our comfort zones, but it is the only way we can grow and continue to be successful. Two examples of tools for continuing education are attending Coverings 2021 in Orlando, FL, July 7–9 and Total Solutions Plus in Jacksonville, FL, October 24–26. These events allow for educational programming, discovering the latest technological innovations, and, probably the most important facet, networking with all the stakeholders in this great industry of ours! I hope to see all your smiling faces at one or both of these events. ■■



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# Finally!

**F**inally! An industry event where we can meet and greet people again! The Coverings 2021 tile and stone trade show will be held at the Orange County Convention Center in Orlando, Florida July 7–9. Your TCAA, in conjunction with the International Masonry Institute (IMI) and the International Union of Bricklayers and Allied Craftworkers (IUBAC), will host an information booth. We hope to see all of our old friends and meet new ones at our booth and to catch up with our supplier members in their booths. Please stop by our booth, #3233 in the TCNA Pavilion, and say hello.

We have also put together a “State of the Industry” meeting with IMI and IUBAC to plan for how we can best put forth, as BAC signatory contractors, meaningful programming to enhance our presence in the marketplace. As we all know, the construction industry has had a significant pause in activity. Also, the future for commercial building

could and probably will look significantly different in the future as workplace environments change.

However, on the positive side, we know that the housing industry is booming, including multifamily and high end condominiums. Ceramic tile and stone are still considered the preferred selection for use in almost every type of building. It is TCAA’s job, as your industry representative, along with our partners at IMI and IUBAC, to educate owners, architects, and end users to the added benefits of ceramic tile when installed properly by qualified and certified contractors and labor.

I hope many of our contractors can attend Coverings. It is time for us to get out from in front of our computers and to be seen smiling and laughing in person again! 🇺🇸

John Trendell  
*TCAA Labor Committee Chair*  
*Trendell Consulting LLC*





By Scott Conwell, FAIA, FCSI  
Director of Industry Development  
International Masonry Institute

# SHEAR BOND STRENGTH

## OF TILE ASSEMBLIES

**T**here are few factors as important to a good tile installation as bond. For a tile assembly to perform well over time, it must remain adhered to the substrate. Tile standards have clear requirements for bond strength, and there are a few ways to test for bond. This article will examine what bond strength is, what its requirements are, and how to test for bond strength.

### What are shear forces?

Although we often discuss bond strength, it is shear strength and, in some cases, tensile strength that are used to ensure the ability of the tile to adhere to a surface. Shear is a force that produces a sliding failure along a plane that is parallel to the

direction of the force. In simple terms, one part of the surface is pushed in one direction, while another part of the surface is pushed in the opposite direction. In a tile assembly, these are the forces being placed between the tile and the substrate.

One example of shear forces acting on a tile assembly is a floor spanning between two beams which deflects under a load (Fig. 1). At the area of greatest deflection, between the beams, the substrate is undergoing compression and is becoming shorter. Conversely, immediately over the beams the substrate is in tension and is becoming longer. The tile wants to stay the same size, but the shear forces acting on it from the substrate are in danger of causing the tile

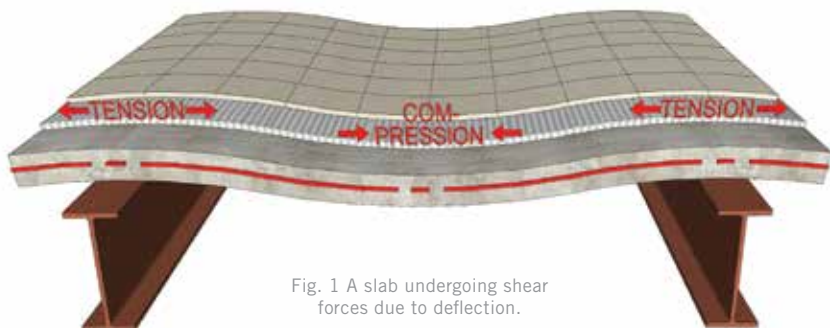


Fig. 1 A slab undergoing shear forces due to deflection.

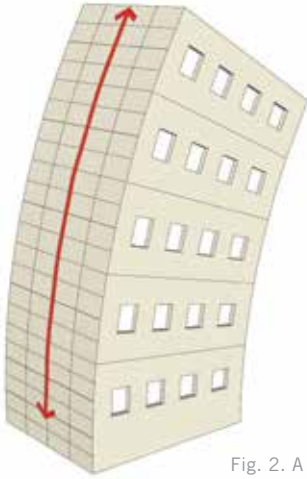


Fig. 2. A building undergoing bending due to lateral load, creating shear forces in the walls.

to become unbonded if the shear bond strength of the mortar is not sufficient.

Another example of tile in shear is a tall building with an adhered tile facade undergoing a wind load causing the building to bend (Fig. 2). The windward side of the building elongates, creating shear forces which the tile assembly must resist. As in the previous example, if the shear strength of the tile or the mortar is insufficient, the bond could fail. In this example, it is possible that tiles may fall from the building, causing a dangerous situation.

### What is shear bond?

Shear bond strength is the maximum shear force an assembly can sustain before the bond fails. Shear bond strength is measured in pounds per square inch (psi) and is calculated by dividing the load at failure by the bonded area. We can avoid failures in shear bond by using tiles and mortar that meet minimum bond strength requirements as specified in American National Standards Institute (ANSI) standards, by correct application of bonding

mortar including minimum coverage and embedment practices, and by making sure the substrate is suitable for bonding.

### What are the types of shear bond failures?

There are a few different ways to look at shear bond requirements for tile assemblies. It is unlikely that the tile itself will shear (Fig. 3, CF-T), but under extreme conditions, shearing of a very soft natural stone or tile could occur. For ceramic tile installations, it is more likely that failure may occur at the bond between the tile and the mortar (Fig. 3, AF-T) or between the mortar and the substrate (Fig. 3, AF-SU). It is also possible that the mortar itself may fail due to loss of cohesive strength when subject to shear forces (Fig. 3, CF-A). Finally, cohesive failure could occur within the substrate itself (Fig. 3, CF-SU). Careful material selection and design and installation safeguards should be taken against each of these potential types of failures.

### What are the requirements for shear bond strength of tile?

ANSI A137.1 specifies minimum bond strength of 50 psi for mosaic tile, quarry tile, pressed floor tile, glazed wall tile, and porcelain tile, when tested in accordance with ASTM C482. This is a test of the tile's ability to bond to an adhesive of portland cement paste, which is bonded to a generic backing of a cured cement mortar bed. It only measures failure between the tile and the cement paste adhesive (Fig. 3, CF-T), not failure between the cement paste and the setting bed (Fig. 3, AF-SU), nor failure of the setting bed itself (Fig. 3, CF-SU). This test is a measure of the bond strength of the tile itself.

Reference to ASTM C482 is also made in TMS 402, *Building Code Requirements for Masonry Structures*, in the adhered veneer



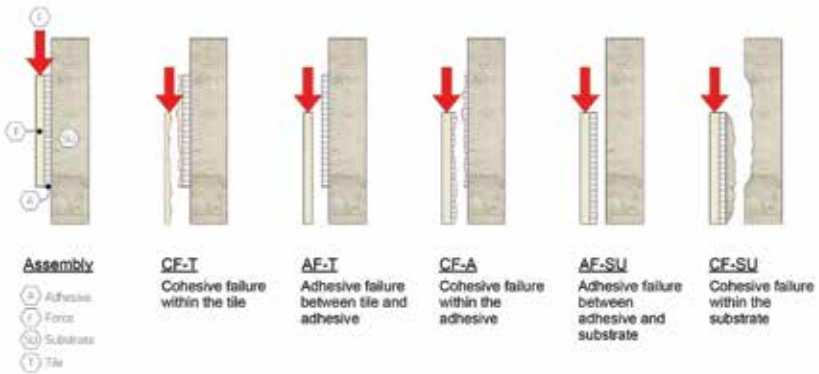


Fig. 3. Failure modes of a tile assembly; Illustrations adapted from ASTM C1823.

section, stating “Adhesion developed between adhered veneer units and backing shall have a shear strength of at least 50 psi.”

### What are the requirements for shear bond strength of mortar?

In addition to sufficiently strong tiles, appropriately strong mortar must also be used to prevent shear bond failure, and it must be applied to minimum coverage requirements. The ANSI standards for dry-set mortar (ANSI A118.1), modified dry-set mortar (ANSI A118.4), and improved modified dry-set mortar (ANSI A118.15) each specify requirements for shear strength of the respective mortars. These tests are described as testing “shear strength of mortar to tile.” Adherence to these requirements guards against failure of the bond between mortar and tile (Fig. 3, AF-T).

As an example, let’s look at the requirement for shear strength specified in ANSI A118.15. The standard requires the seven-day shear strength for improved modified dry-set mortar to be a minimum of 450 psi when it is used with glazed wall tile, 300 psi when used with porcelain, or 150 psi when used

with quarry tile. Mortar manufacturers must test their materials to these requirements in order to market them as compliant with ANSI A118.15.

This test is done in a laboratory using two 1 in. x 1 in. tiles with a 1/8 in. mortar joint and applying a load until the joint fails. This is a test of the mortar’s capability to bond to the tile. A similar test is used for ANSI A118.4 modified mortars, but with slightly lower required minimum strengths.

Both test methods described above, ASTM C482 for tile and adhered masonry, and the ANSI A118 shear test for mortar to tile, are laboratory tests performed to accurately predict the bond of the materials prior to their installation. But how do you test for bond strength of tile that has already been installed? There are a few test options that can be used for in situ (in-place) testing, including ASTM C1823 *Standard Test Method for Shear Bond Strength of Adhered Dimension Stone*, or ASTM C1583 *Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)*.

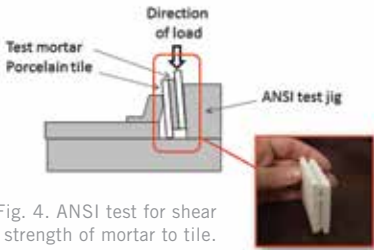


Fig. 4. ANSI test for shear strength of mortar to tile.

### How do we test installed tile assemblies for shear strength?

It is sometimes necessary to perform tests on installed tile assemblies, for example to check quality control, or if the assembly is suspected to have questionable bond strength. ASTM C1823 is a relatively new standard test method that tests shear bond strength in the field or in a laboratory. It was developed for adhered dimension stone, but it may be adapted to ceramic tile assemblies. In the test, an apparatus is attached to the tile with plates that are saw-cut into joints. A hydraulic pressure is applied which causes the plates to expand, causing a failure. The load at the point of failure is recorded. This test is useful to examine the type of failure and its potential reasons. The downside is that it is destructive and costly to repair the assembly when done as a field test.

### Tensile bond strength

In some situations, a tensile bond pull test may be preferred to a shear bond test on an installed tile assembly, since pull tests may be considered less destructive. Unlike shear bond, which resists opposite parallel forces in the plane of the mortar, tensile bond is the pullout or pull-off forces imposed on the mortar. Tensile bond strength is a measure of the mortar's resistance to tension. Tile rarely fails in pure tension, therefore shear bond is the

primary measure of bond strength. ASTM C1583 is an in-situ test that pulls adhered tiles out of bond and records the load at the point of failure.

### Installation practices

Ideally every project will have tile, mortar, and substrates that comply with ANSI standards and other requirements for shear bond. The final and perhaps most important part of the equation is workmanship. Even with the best materials and field conditions, improper tile installation can result in bond failure. TCAA tile contractors and BAC tile installers are familiar with the requirements for mortar coverage, mortar application techniques, tile embedment, and the many other techniques required for a good installation. We can be confident that union installation of tile materials meeting ANSI standards will stay bonded and provide a permanent and beautiful finish for the life of the building. ■



Fig. 5. ASTM C1823 Standard Test Method for Shear Bond Strength of Adhered Dimension Stone. Photos by Wiss Janney Elstner Associates, used with permission.



## TILING THE FUTURE...

**Artisan Tile and Marble Company of New Jersey, Inc.** • Somerset, NJ

New Jersey Economic Development Authority Taxation Building—Trenton, NJ

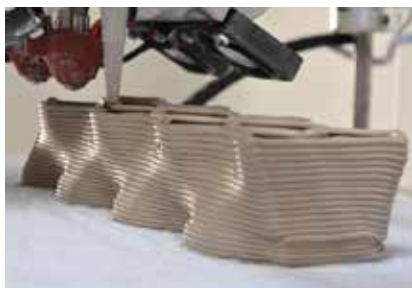
**Unique Feature Wall Tiles Produced with Custom Built 3D Printers—The First of its Kind Installed in the U.S. at the New Jersey Economic Development Authority Taxation Building**

**A**rtisan Tile and Marble of New Jersey ([www.artisannj.com](http://www.artisannj.com)) recently completed the ceramic tile work for construction manager Torcon, Inc. at the New Jersey Economic Development Authority's new Taxation Building in Trenton, NJ. This 8-story 212,000 SF office building is located near the Delaware River waterfront, an area master planned to transform the state office complex into a mixed-use urban experience. The Taxation Building is strategically located near other state offices and the Trenton downtown commercial corridor.

Artisan Tile & Marble of New Jersey installed over 70,000 SF of ceramic tile

in this facility, which included over one-hundred areas including toilet rooms, lobbies, elevator lobbies, pantries, drinking fountains, and a feature art wall in main lobby. Materials included American Olean, Daltile, Olympia Tile from New Jersey Tile & Stone, Schluter Systems products, Crossville tile from Garden State Tile, and Metro from Nasco Stone & Tile.

The custom tile artwork feature wall in the south lobby consisted of 200 incredibly unique 12"x12"x2" tiles that were produced using custom-built ceramic 3D printers. The tiles were designed and manufactured by Brian Peters at his studio in Pittsburgh, PA



([www.brian-peters.com](http://www.brian-peters.com)) and are the very first of its kind installed in the United States. Mr. Peters is an architect, spatial artist, educator, and an award-winning fabricator. He specializes in producing 3D printed ceramic blocks and tiles for custom architectural applications.

The process is very unique; Brian designs each tile digitally from two dimensional sketches and drawings into digitally modeled 3D geometrics that will be materialized in space and then sends the fabrication files to custom 3D printers he has built himself. Using an earthenware clay mixture for this project, each tile is printed in a continuous coil, layer by layer, until the preselected tile design is complete, typically taking between one to two hours. After smoothing and refining any rough edges by hand, the raw tiles are then dried, fired in a 2,000-degree (F) kiln for 12 hours, glazed again by hand and fired a second time, resulting in a perfectly made 3D tile.

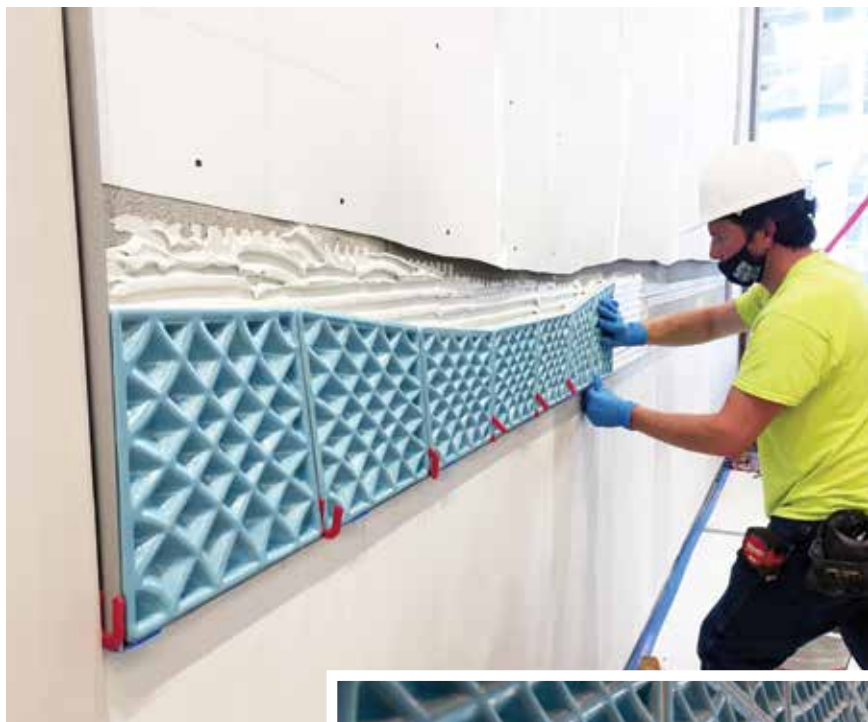
Nancy Czarkowski of Artisan Tile & Marble Co. of NJ, Inc. worked closely with Brian Peters to coordinate the final installation of the 18-foot by 8-foot custom tile work project. The individual tiles were installed over a backer board using Laticrete's Multimax Light thinset and grouted with their Permacolor grout. Nancy is quoted as saying, "with the advent of 3D printed tiles, we may have to redefine the age-old definition of ceramic tile."

Chris Proniewski, a union tile mechanic working for Artisan Tile and Marble of New Jersey, Inc. from Local 7 TMT NY/NJ stated after completing the tile installation, "it was an honor...Tiling the future."

#### **About Artisan Tile and Marble of New Jersey**

Artisan sets themselves apart from their competition by providing their customers with superior service and craftsmanship, maintaining a professional atmosphere, and consistently exceeding the expectations of others. Every member of Artisan Tile and Marble strives to maintain the status of a recognized leader in the tile industry using integrity, innovations, and honesty, as a true Artisan should.





Artisan Tile & Marble Co. of NJ, Inc. was originally incorporated in 1964. The selection of the company's name, which means true craftsman, is reflective of the company's commitment to outstanding quality, value, and dedication to professionalism. In the 57 years that have followed, Artisan has lived up to its name, offering outstanding and award-winning installations ([www.artisannj.com](http://www.artisannj.com)) work. Artisan has installed over 50 million square feet of tile in nearly 15,000 projects, has worked for over 1,500 GCs and is certified as a Tile Contractors' Association of America (TCAA) Trowel of Excellence® contractor ([www.tcaainc.org/trowel](http://www.tcaainc.org/trowel)).

Always on the cutting edge of technology, Artisan has grown to become one of the largest union commercial tile and stone contractors in New Jersey. It is now the recognized leader throughout the industry. To learn more about Artisan Tile & Marble Co. of NJ, Inc. please visit [www.artisannj.com](http://www.artisannj.com). ■



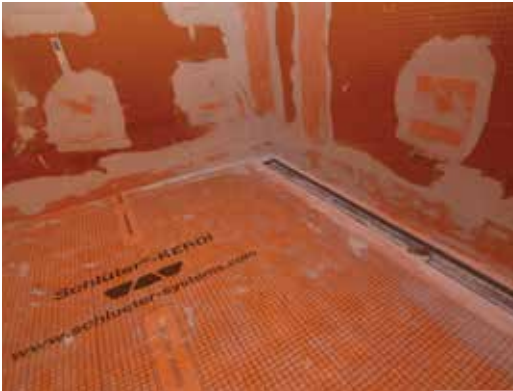
## Heated Shower Floors:

### A LUXURY WITHOUT BARRIERS



By Dale Kempster  
Schluter Systems North America

**A**pproximately 10 years ago I was renovating my bathroom and thought it would be great idea to heat the floor so in the winter when I got up in the middle of the night, I would have a nice warm floor, avoiding a cold shock on bare feet. I had taken out the old tub and was installing a tiled shower using a prefabricated shower pan made of expanded polystyrene (EPS). It was then I came up with a grand idea that since EPS has insulating properties, why not heat the floor in the shower? It was a novel idea at the time, but why not give it a try? In the worst case scenario, I could turn the power off if the cost of electricity seemed excessive for the extra comfort. I live in Quebec, Canada which happens to have one of the cheapest electricity rates in North America, currently a blended average of 8.50 cents (Canadian) per kWh. Knowing that the cost to run my floor would not be excessively expensive, since it's a small area at only about 40 sq ft in total, I forged ahead. I programmed the thermostat to heat the floor from 7:00 to 9:00 a.m. and 6:00 to 11:00 p.m. at a comfortable 78°F (26°C). The electricity for this heat costs me about 12 cents per day.



### Membranes and Cables

In the ten years since I installed my warm shower floor, there have been a lot of developments to make this type of project easier. Pre-sloped prefabricated shower trays come in a huge array of dimensions made for both point drains and linear drains. Prefabricated foam trays are made with expanded or extruded polystyrene and typically offer an R-value of just over an R4 per 1" (25 mm). A specially configured membrane which can hold heating cables at approximately a 3" (75 mm) spacing is applied on top of the prefabricated tray (or mortar base). Using these membranes eliminates the need to embed the heating cables in mortar or leveling compound and wait for that to dry overnight. Even though these membranes are typically waterproof and heating cables can be rated for use in wet areas, manufacturers often require the application of a waterproofing membrane over the cables in the shower area itself. In general, make sure to follow manufacturers' instructions and confirm code compliance with the local inspector or authority having jurisdiction.



A dedicated heating cable is recommended in the shower area to allow for simple disconnection without an impact on the floor heating in the rest of the bathroom in the event that the shower heating cable is damaged. Multiple heating cables can typically be connected to a single thermostat, up to the total current limit, if desired. It is also advisable to place both the cold lead splice and the end splice outside of the shower area so it is easier to gain access to these sections if a repair is ever required. For convenience and very little cost a second sensor wire for monitoring the temperature

of the floor can be installed so that if the first sensor wire gets damaged during installation or becomes defective, it can be disconnected and the back-up wire can be connected (bottom photo, page 13).

### Curb or No Curb

Another feature that is commonly requested is a “barrier free” or “curbless” shower floor, which can be accomplished by using the foam board throughout the whole floor of the bathroom or by recessing the shower floor as shown in the TTMAC Tile Installation Manual Detail 319 SR/BF (see drawing) on wood frame construction. If a curb is desired, do not make the mistake of installing the heating cable under the curb, especially if using preformed curbs made of expanded or extruded polystyrene like the shower trays. The insulation value of those elements can result in a damaged cable due to overheating if it is installed underneath the curb. The cable must be installed over the curb making sure that the cable is not bent at a right angle but is installed in a more a rounded configuration. By taking these precautions you prevent causing a hot spot which can damage the cable.

Having a heated floor in the shower eliminates the need for a water outlet (toe warmer), which is one less item to keep clean. In the case of the shower

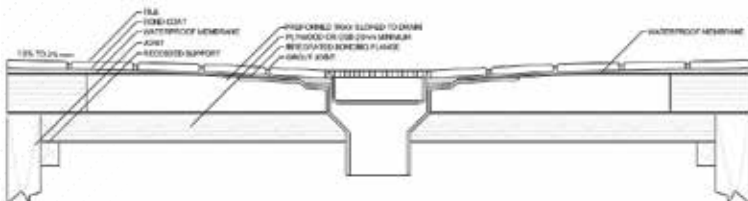
shown in the photos, the use of a large format tile was made possible by incorporating a linear drain. The drain was installed against the wall with the shower base being sloped on a single plane toward the drain.

### Summary

Over the past 10 years, I have had a quite a few friends and colleagues who were surprised I heated my shower floor, and some even questioned if it was safe! It is definitely safe, and there are some belts and suspenders built in with not just having a ground fault interrupter (GFI) on the thermostat but also two layers of waterproofing encapsulating the heating cable so that it will never see a drop of moisture throughout the many years of use and enjoyment! A heated shower floor is a luxury that can be done effectively, and with modern materials and methods, the only barrier to not doing it is just the commitment to having it done. 🇺🇸

**About the author:** Dale Kempster is Director of the International Technical Network for Schluter Systems North America and has been with the company for 34 years. Dale works closely with industry associations, contributes to industry standards and methods, and ensures that the interests of the tile industry are considered and represented appropriately in numerous associations and standards setting bodies nationally and internationally.

*\*If the shower is high use or is actually a steam shower, and the waterproofing membrane is acting as both the waterproofing membrane and the vapor retarder the waterproofing membrane must have a perm rating of .5 or less using ASTM E96 Procedure E with 90 % humidity. If the waterproofing membrane has a perm rating higher than .5 then a vapor retarder should be used behind the solid backing that has a perm rating 1.0 or less when tested with ASTM E96 Procedure A.*





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## HISTORY OF TILE

# BATCHELDER:

## A Taste of Chocolate

### PART TWO

**“Our tiles are hand wrought, by processes peculiar to our own factory. They have slight variations of shape and size—just sufficient to relieve the monotony of machine pressed tiles. These variations are not sought; they are desirable and inevitable in a handmade product. We make the very best tile we can possibly make by hand.”**

**I**n 1912, leaving his garden studio behind, Ernest Batchelder took on a partner, Frederick L. Brown, and established a small factory at 769 South Broadway in Pasadena “down among the gas tanks in a galvanized shed in regions remote from neighborly solitude.” From 40 six-inch tiles per firing, the new kiln could handle 500. The tiles were initially dried in the sun. “We watched them—the tiles—as a cook watches a pancake griddle.” When “artificial” drying became a logical preference, a room was formed with tarpaulins and was heated with a gas stove. Soon, with two additional kilns, the capacity reached 4,000 tiles.

The new company, Batchelder & Brown, was quick to publish a catalog, the first of many to appear over the next twenty years. The tiles’ colors were “like those of old Persian rugs” and were described as luminous, mellow and glowing. By using clay slips (engobes) the tones were intentionally muted, designed to enrich and blend harmoniously into the residential environment without drawing undue attention.

1914 was a most significant year for Ernest Batchelder. Plummer and Feil, Architects, commissioned Batchelder to design and supply the tiles for the Dutch Chocolate Shop at 217 West 6<sup>th</sup> Street in downtown Los Angeles. The

job, by far the largest to date, involved the tiling of the entire interior space—floors, walls and vaulted ceilings—that included a series of wall murals depicting scenes from Holland.

The late Robert Winter, the architectural historian who resided in Batchelder's house for much of his adult life, acknowledged that Batchelder had a team of talented designers, some his former students, who were instrumental in creating his decorative portfolio as well as the larger



tile murals. Specifically, Anne Harnett had become the “trusted assistant” who did the research and design work for the Dutch Chocolate Shop project.

Batchelder wrote: “In working out these schemes we made our composition to a small scale, in charcoal, in order to get the massing and space breaking, utilizing for local details all the data that we could get hold of. Having established the scheme on a small scale we then erected a long



board in the studio, which enabled us to keep two full-sized cartoons going at once. The cartoons were worked up in full-size enlargements from the smaller compositions, traced and transferred to full-size slabs of moist clay. Each clay panel was then modeled in three general planes [then cut into 6” x 6” units and allowed to dry] and then glazed and fired, each unit being marked with a key in order that the panels might be properly assembled when ready for setting.”

The site at 217 West 6<sup>th</sup> has served the public in many ways over the years since chocolate lost its “taste” (popularity) by the early '20s. Shortly thereafter the Bragg (Foods) family





reopened it as the Health Cafeteria until the market crash in '29. Samuel Finney took over in the early '30s establishing Finney's Cafeteria, which thrived into the mid '80s having received status as a Historic-Cultural-Monument in 1975. In 1986, Net Investments Co. sold its interest to the 217 West 6<sup>th</sup> Street Partnership, which is when the space evolved into an arcade of small shops partitioning the area with boards over the tile murals and roll-up doors secured with bolts through the ceramic surfaces.

Fortunately, in recent years an inspired individual has taken control of the building, removing all of the interior trash including the boards



and partitions, exposing to public eyes Batchelder's famed Dutch Chocolate Shop with its unique tile installations. Although the space remains closed to the street, we can rest assured that, at least for the meantime, the tiles have survived.

There will still be more to come. ■■

Joseph A. Taylor  
*President, Tile Heritage Foundation*  
*Cesery Award recipient in 2003*  
[www.tileheritage.org](http://www.tileheritage.org)

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All quotations are from Ernest Batchelder's pen (exc. "taste").

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# History of Gauged Porcelain Tile Panels

## WHERE ARE WE NOW?



By Will White  
Custom Building Products

**E**uropean tile manufacturers developed machinery that revolutionized the industry! They created tiles measuring up to 3m x1.5m (10' long and 5' wide)! Not only were they flatter and thinner than other Porcelain tiles, but they could also be textured and designed to mirror large natural stone slabs—without the weight!

## CREATING STANDARDS

With this new process, the tile industry had to determine how to classify these enormous tiles, what would be the correct way to install them and how to test them. Standards for this product category were still being developed by the Tile Council of North America (TCNA), American National Standards Institute (ANSI) and International Organization for Standardization (ISO). These organizations were in

technical sub-committee with testing and document development, and yet the appeal of the material had quickly moved them into specifications.

With no standards available, industry professionals decided to move forward with recommendations based on the composition of materials and installation guidelines from their manufacturers.





### **2017 Material Standard**

ANSI A137.3 American National Standards Specifications for Gauged Porcelain Tile and Gauged Porcelain Tile Panels/Slabs.

### **2017 Installation Standard**

A108.19 Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by Thin-Bed Method bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar.



### **NEWEST Standard (published Jan. 2021)**

ANSI A137.3/A108.19/A108.20-2021 American National Standard Specifications for Gauged Porcelain Tile Panels/Slabs (Material and Installation Standards).

- This includes the addition of ANSI A108.20 Exterior Installation of Vertical and Overhead Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method bonded with Improved Modified Dry-Set Cement Mortar.

Tile/panel manufacturers and setting material manufacturers like Custom Building Products along with the TCNA had been conducting material testing and installation methods development since 2011. Hundreds of thousands of dollars were invested in laboratory and installation method testing over a five to six-year period in support of the porcelain panels.

In general, the consensus was that a 5–6mm thick panel was acceptable for exterior facades, interior wall cladding and flooring applications. At the same time, it was determined that the 3–4.9 mm thickness panels were ideal for millwork and tile over tile applications, and finally, 12 mm thick panels were excellent for countertop applications and vein matching accents commonly done with stone slabs.

#### **TPT TO GPT AND GPTP?**

The commonly used designation of “Thin” Porcelain Tile Panels did

not clearly identify size or thickness of the various range of products available, nor would one terminology afford performance standards to be developed for various products. Panel manufacturers and ANSI technical committee members discussed options and decided to utilize terminology from the wire industry, specifically the American Wire Gauge (AWG), which covers all thicknesses of product offerings and enables differentiation of product performance standards. That is how the thin tile descriptor became Gauged Porcelain Tile and Gauged Porcelain Tile Panels/Slabs. This mouthful is often shorted to the acronym “GPTP.”

**November 2017**—A historical event in the tile industry took place. For the first time, a material and installation standard were developed, voted on and passed simultaneously through the ANSI technical committees.





## EXTERIOR INSTALLATION CHALLENGES

The International Building Code (IBC) and International Code Council (ICC)'s [BS] 202, TABLE 1404.2, [BS] 1404.10.2 for exterior adhered materials [BS] 1405.10.2 Exterior adhered masonry veneers—porcelain tile limited the size and weight of exterior adhered veneers using porcelain tile already. What can be done with these even larger tiles and panels?

The code states adhered units shall not exceed 5/8-inch (15.8 mm) thickness and 24 inches (610 mm) in any face dimension nor more than 3 square feet (0.28 m<sup>2</sup>) in total face area and shall not weigh more than 9 pounds psf (0.43 kN/m<sup>2</sup>). Porcelain tile shall be adhered to an approved backing system. These

stipulations clearly excluded most Gauged Porcelain Tile Panels (GPTP) when used in common sizes, even though GPTP weights are as low as 3 lbs/SF. (See Figure 1.)

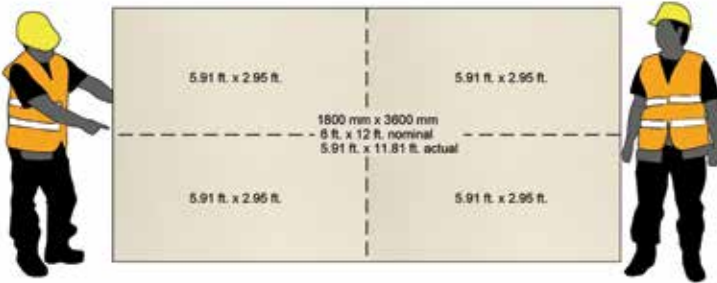
Even so, architectural specifications called for GPTP but also stated to follow IBC guidelines. This led to a lot of discussion to move the process forward. Fortunately, applications for variances were successful because GPTP is so lightweight, and most projects were approved for installation.

Due to the efforts of the TCNA and the International Masonry Institute (IMI), on May 6, 2019, the IBC approved revisions/updates to Chapter 14 Exterior Walls and as of January 2021,

Figure 1



Figure 2



Exterior Adhered Porcelain Tile Sizes  
Scale: 1/2" = 1'-0" Rev. 05/14/19

it was officially published. Much larger porcelain tile sizes are now approved for use as shown in Figure 2.

What was initially perceived as a niche type product in the tile industry has become very popular with millions of square feet manufactured, sold and successfully installed.

Hundreds of GTP installation training sessions over several years have been administered by the NTCA, manufacturers of the gauged porcelain tile panels and setting materials companies like CUSTOM to provide the required hands-on training to installers nationwide.



Training is essential to a successful installation for those contractors who have never installed GPTP. It's a whole new world in setting tile! Training includes critical planning, shipping and handling techniques, cutting and finishing with different tools, very specific troweling and bedding methods and movement joint treatment. Just ask anyone who's taken the course!

In fact, it's so crucial that the ANSI A108.19/20 technical committee included language specific to what a "Qualified Installer Program" is, which can be found in section 9 of ANSI A108.20 and section 10 of ANSI A108.19 as a requirement to complete before installation is to proceed. So, what that means is, if your project has GPTP and has ANSI A108.19/20 listed in the architectural specification, you need to have this training. Additional language has been included in Appendix C of the ANSI standards as an informative section outlining the minimum requirements for Gauged Porcelain Tile (GPT) / Gauged Porcelain Tile Panel/Slab training. The GPTPS Installer Qualification Program is considered to be "comprehensive" in accordance with section 10.0 of ANSI A108.19 or Section 9.0 of ANSI A108.20.



GPTP will be a "large" part of the tile industry for many years to come!

Congratulations to the ANSI committee members and companies who all contributed tirelessly to the testing and time required to develop these detailed material and installation standards. 🇺🇸

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**About the author:** Will White is Director of Technical Communications and Training for Custom Building Products. He is a member of the National Tile Contractors Association (NTCA), Tile Council of North America (TCNA), Materials and Methods Standards Association (MMSA) and a committee member of American National Standards Institute (ANSI).



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