

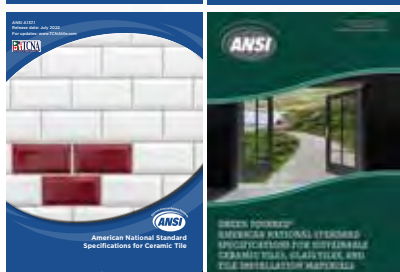


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TCNA BULLETIN

A NEW TWO-CENTIMETER PORCELAIN PAVER SPECIFICATION BORN OUT OF THE PANDEMIC

The COVID pandemic had a considerable influence on daily life including helping people venture outdoors and reconnect with nature. What began as a stopgap solution for social distancing, increased use of outdoor living spaces, led to new must-have designs and opportunities for ceramic tile, especially two-centimeter and thicker porcelain pavers which are especially versatile outdoors. While exterior ceramic tile applications are not a new concept, porcelain pavers unlocked an expanded outdoor market and new installation options.

With porcelain pavers' rapid growth in popularity, the market demanded a performance-based product specification, to provide a baseline for product quality and a mechanism for specifiers, installers, and consumers to identify the unique properties of porcelain pavers.



Due to their extraordinary strength, two-centimeter and thicker porcelain pavers can be installed in unbonded applications, either in raised flooring on pedestals or loose-laid over sand or gravel. For these unique applications, new test methods and criteria were needed. After extensive research by TCNA and standards development work by the ANSI A108 Committee, revisions to ANSI A137.3, *American National Standard Specifications for Gauged Porcelain Tiles and Tile Panels/Slabs*, were approved in the spring of 2022. These included new definitions, test methods, and performance criteria for two-centimeter and thicker gauged porcelain pavers.

Unique Properties

As porcelain pavers are most commonly installed in loose-laid applications (i.e., without the use of adhesives) or in raised flooring applications, strength and impact criteria are critical. Tiles installed in these applications aren't supported in the same way as those using adhesives, so new test methods were needed to evaluate products used in these systems.

Breaking strength

In applications such as raised flooring over pedestals, the tile support system is vastly different from an adhered application over a more traditional substrate. The gauged porcelain paver standard requires tiles to be tested for breaking strength using a three-point bending method. This more accurately replicates the support system found in unbonded applications and provides a good assessment of how porcelain pavers will perform in the field.

Impact Resistance

While it is uncommon to measure impact resistance for ceramic tiles intended to be installed with mortar, measuring impact resistance is necessary for porcelain pavers that will be installed in an unbonded application.

This is because porcelain pavers in unbonded applications



are not reinforced by an adhesive and substrate, and as such they are more susceptible to impact damage than tiles in a traditional installation. To evaluate impact resistance for unbonded tiles, a new test method was developed, evaluating whether damage occurs when a soft body object (88-lb. sandbag) and a hard body object (2" solid steel ball) are dropped from specified heights. The method specifies testing in common unbonded applications, including tiles on pedestals and over a bed of sand.

Compressive Strength

Compressive strength is not typically a specified physical property for conventional ceramic tile, as products that are relatively thin in relation to facial area do not commonly exhibit compressive failures and tile in general has a compressive strength many times greater than that of the substrate. However, for tiles used in paving applications subject to heavy rolling loads and/

or vehicular traffic, the A137.3 standard now includes compressive strength criteria for porcelain pavers, using a test methodology similar to how brick and concrete pavers are tested when intended for these applications.

What's Next for Gauged Porcelain Pavers?

With the gauged porcelain paver product specification now available, standardizing installation practices for porcelain pavers is the next industry challenge. Currently, there are no installation standards for gauged porcelain pavers, although manufacturers certainly have proprietary recommendations specific to their products.

As the market becomes increasingly complex with more porcelain paver products, consensus-based installation standards can help create common installation practices and facilitate better training, proper specification, and future growth of this exciting new segment.

TCNA BULLETIN

LABORATORY TESTING LEADS THE WAY FOR PRODUCT SUCCESS



The rapidly changing market of new surface products and the evolving interest in green building initiatives has changed the landscape for ceramic, glass, and stone tile installation. Along with these market changes, new standards and methods are being developed. Testing products to ensure standards compliance or custom testing for innovative products are critically important for products to become and/or remain competitive.

The Tile Council of North America (TCNA) Product Performance Testing Laboratory is known as a trusted partner in surface testing for over 60 years. Additionally, the laboratory has performed research to support the development of important industry standards such as the hard surface flooring test method for dynamic coefficient of friction (DCOF), a consistent global absorption testing method, new specifications for 2CM porcelain paver products, and the first ever international test methods for ceramic tile with antimicrobial glazes. As industry and consumer needs have evolved, so has the lab's expertise and testing capabilities.

A broad growth in capabilities initiated the need to communicate the lab's diverse range of international testing services and led TCNA to rebrand the laboratory as International Product Assurance (IPA) Laboratories in 2023.

“The new name and branding have opened the door for our laboratory to offer more testing services to our customers and to explore new areas of testing that benefit from our expertise,” explains Katelyn Simpson, IPA Laboratories’ Director of Laboratory Services.

The team at IPA Laboratories offers:

- A large array of ISO 17025-accredited tests for ASTM, ANSI, and ISO standards, as well as customized testing for research and development
- Over 125 years of combined experience in product evaluation and research
- Participation and leadership in over twenty international standards committees providing unmatched knowledge into standards and testing methods
- Award-winning customer service

Expanded Testing Options

Previously, the work of the laboratory focused on the ceramic tile industry including testing ceramic, glass, and stone tiles and panels, installation materials, tile



“As consumers and specifiers continue to seek safe, durable, and healthy products, International Product Assurance Laboratories will continue to provide the independent and trusted testing needed to evaluate these products and support our clients worldwide.”

— Eric Astrachan, TCNA Executive Director

substrates, and raw materials to national and international standards. Today, the lab’s testing services encompass testing all surface coverings, including concrete products such as pavers, countertop surfacing materials, composite materials such as LVT, LVP, and rigid core products, as well as offering sustainability product testing, and expanded services in IPA Laboratories’ Life Sciences department.

Life Sciences Testing

The laboratory has a long history of microbiological testing and research on ceramic tiles and other floor and wall coverings. In response to concerns from the COVID-19 pandemic, antiviral testing was added to the lab’s services to determine the survival rates/duration of viruses on different surface materials and the efficacy of common household cleaners to disinfect these surfaces. The lab’s expansion into antiviral and microbiological testing has led to new opportunities outside of the ceramic tile and hard surface industry, such as the antimicrobial/antiviral analysis of fabrics, disinfectant sprays, plastic films, and many other materials. This



growth has led to custom testing and research for any type of product.

Sustainability Testing



As testing options are added to serve different industries and initiatives, the lab also continues to add new services that are relevant to tile and tile-related products. For example, there has been a dramatic rise in customers’ needs to test their building products for sustainable characteristics. To provide the best possible service, the lab is equipped with state-of-the-art equipment for determining solar reflectance index (SRI—a measure of solar energy reflected by a surface) and light reflectance value (LRV—a measure of a material’s ability to radiate heat). Many of the lab’s testing options for sustainable products are critical for obtaining LEED sustainable sites (SS) credits, LEED indoor environmental quality (IEQ) credits, qualifying for other LEED pilot credits and green building initiatives, and credits toward conformance with ANSI A138.1, Green Squared® certification. IPA Laboratories offers testing for any product seeking these or other LEED credits. These

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LABORATORY TESTING LEADS THE WAY FOR PRODUCT SUCCESS

testing results are important for manufacturers to understand, and for specifiers and designers to utilize, when aiming to satisfy the marketplace demands for sustainable building.

IPA Laboratories will expand further in 2024 to become an approved certifier for the Green Squared® certification program. This step for the lab, which draws upon the lab's long history in the tile industry and unparalleled understanding of tile and installation products, allows IPA Labs to serve manufacturers both for testing needs and for obtaining Green Squared® certification.



Life Cycle Cost Analysis Service

In 2023, TCNA commissioned an independent consultant, Emily Lorenz, PE, F-ACI, to conduct a [Life Cycle Cost Analysis](#) study.¹ This study compared 18 different flooring types and specific variables to calculate the lifetime cost of a flooring material. IPA Laboratories now offers a life cycle cost analysis service for any flooring product. Standardized per ASTM E917, an LCCA can be used to calculate the overall costs of differing flooring systems over a building's expected lifetime. Costs incurred at various points throughout the lifetime are considered, including materials costs, installation costs, maintenance costs, demolition costs, and replacement cost. International Product Assurance Laboratories works with clients to determine project-specific parameters (such as flooring types to be analyzed, cost frequencies, etc.) to provide a customized LCCA report containing overall life cycle costs. This robust analysis provides insight into long-term costs by allowing different flooring options to be compared for various economic conditions, enabling investors,

¹ The TCNA LCCA Industry Report can be found on the TCNA website, TCNATile.com.

architects, purchasers, specifiers, and more to select a flooring system with the lowest cost per year (per square foot).

A Partner in Success

IPA Laboratories is committed to unparalleled customer service. The team prides itself on helping customers understand the appropriate tests for compliance with standards, so that customers order exactly the tests they need. IPA Laboratories' main facility is located in the Clemson University Innovation Campus and Technology Park with access to a broad spectrum of equipment including SEM, TEM, GCMS, FTIR, ICP-EMS, and more. This proximity to advanced testing equipment and the expertise of the lab's technicians, scientists, and engineers allows for a unique opportunity for customers to work with a lab that can assist with the customization of any testing or research goal, as well as provide forensic evaluation when product or installation failures occur.

A full list of IPA Laboratories' testing services can be found at www.ipalaboratories.com. For assistance or to discuss custom testing with the lab team, email testing@ipalaboratories.com or call 855-IPA-LABS (855-472-5227). Follow us on LinkedIn, Facebook, X, and Instagram for testing and standards updates.





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TCNA BULLETIN

PRODUCT USE CLASSIFICATIONS AIM TO REDUCE SLIP INCIDENTS ON HARD SURFACE FLOORING

ANSI A326.3, the American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials, was first published in 2017 to describe the test method for measuring dry or wet dynamic coefficient of friction of hard surface flooring materials in the laboratory or in the field. In 2021, ANSI Accredited Standards Committee A108 voted to incorporate five product use classifications into the standard to provide manufacturers with a standardized framework to communicate product use based on slip resistance.

Dynamic coefficient of friction (or “DCOF”)¹ measurements have been used to provide insight into the slip resistance of materials for decades. While DCOF measurements continue to be utilized today, and are useful to provide a comparative assessment of flooring, understanding slip resistance and anticipating product use requires additional considerations. Taking this into account, the ANSI Accredited Standards Committee (ASC) A108² developed a five-category product use classification system in ANSI A326.3. Product use classification is intended to provide specifiers, designers, and architects with information on where products may be used based on slip resistance parameters. Crucially, the system allows for manufacturer declared classifications to be made based on criteria including and in addition to DCOF measurements.

¹ ANSI A326.3 defines DCOF as the ratio of the force necessary to keep a surface already in motion sliding over another surface divided by the weight (or normal force) of the sliding object. Different contaminants such as dirt, water, soap, oil, or grease can change this value.

² ANSI ASC A108 develops standards which define the installation of ceramic, glass, and stone tiles and panels as well as the test methods, physical properties, and sustainability of ceramic, glass, stone, and other hard surfaces, and related installation materials.



Criteria for the Product Use Classification System

The criteria for all five categories are summarized in ANSI A326.3 **Table 1**; two categories incorporate DCOF criteria as measured per the A326.3 test method, while the majority require manufacturer declarations based on internal selection criteria. Manufacturers can consider a wide range of traction-related parameters for their internal criteria, such as experience with similar surfaces, presence of surface structure or abrasive elements, and results from different test methods used to help evaluate surface traction (e.g., ANSI A326.3, EN 16165 Annex B,³ and EN 16165 Annex C⁴).

³ EN 16165 Annex B describes a European "shod ramp test" method. It requires that human subjects, wearing standardized footwear and a safety harness, walk on an increasingly inclined flooring material until a slip occurs.

⁴ EN 16165 Annex C describes a European "pendulum test" method, which measures the loss of energy as a standard rubber slider assembly slides across a test surface.

Table 1: Product Use Classification

Classification	Reference Category	Criteria
Interior, Dry	ID	≥ 0.42 dry DCOF* (per Section 10.1)
Interior, Wet	IW	≥ 0.42 wet DCOF* (per Section 9.1) or Manufacturer-Declared
Interior, Wet Plus	IW+	Manufacturer-Declared
Exterior, Wet	EW	Manufacturer-Declared
Oils/Greases	O/G	Manufacturer-Declared

The language in ANSI A326.3 on manufacturer-declared product use classifications, found in Section 3.4, is as follows:

Manufacturer shall declare product use classification based on manufacturing parameters, internal quality control criteria, their experience with similar surfaces, and the criteria in this standard for all surfaces classified under Sections 4.1.3, 4.1.4, and 4.1.5, mosaic surfaces, and flooring where surface structure (e.g. three-dimensionally patterned or profiled surfaces) results in misleading DCOF measurements due to test device constraints. Optionally, surfaces classified under Section 4.1.2 shall also be permitted to be manufacturer-declared. Hard surface flooring manufacturer shall define internal product selection criteria (for example, but not in limitation, DCOF limit values established using this test method or other test methods, internal reference standards and practices, and/or the presence

of abrasive grain and/or surface structure) for each product where the manufacturer-declared product use classification is not based on DCOF criteria developed per this standard. Regardless of declared product use classification, specifier shall determine materials appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' guidelines and recommendations.

*The 0.42 DCOF threshold limit in Table 1 applies to the BOT 3000E device; devices being used as equivalent may have different threshold limit values, which shall be independently correlated to those values determined with the BOT 3000E, and independently derived precision statements which shall be provided by the device manufacturer.

This five-category system is similar in concept to the criteria in German rules ASR A1.5 and DGUV 108-003,⁵ which provide product use examples based on “R” values (ranging from R9 to R13) derived from the German adoption of the EN 16165 standard, DIN EN 16165. Examples of work premises with corresponding DIN EN 16165 “R” values are provided in **Table 2**. However, unlike the German rules, the A326.3 product use classification system allows for criteria that do not rely on a single test method; this is beneficial for materials that have complex surface texture, profiling, and/or patterning.

⁵ ASR A1.5 “Floors” is a German technical rule for workplaces. DGUV 108-003 is a German regulation with the title translated as *Floors in work rooms and work areas with a risk of slipping*.



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PRODUCT USE CLASSIFICATIONS AIM TO REDUCE SLIP INCIDENTS ON HARD SURFACE FLOORING



Table 2: DIN EN 16165 acceptance angles, assessment groups, and examples of work premises

Acceptance Angle	Assessment Group (R Group)	Examples of work premises (excerpted from ASR A1.5 and DGUV regulation 108-003)
>35°	R13	Sausage kitchens, vegetable processing, delicacies, or mayonnaise manufacture
>27° to 35°	R12	Commercial kitchens serving over 100 meals per day, manufacture of fats or oils, sculleries, etc.
>19° to 27°	R11	Commercial kitchens serving up to 100 meals per day, machining areas, vehicle repair areas, etc.
>10° to 19°	R10	Garages, damp storage areas, coffee kitchens, sanitary areas, etc.
>6° to 10°	R9	Foyers (indoor), customer and eating areas, corridors, stairways, etc.
<6°	-	Areas without slippery substances

Just as the German rules provide examples of work areas for each “R” value, each A326.3 product use classification lists possible areas of use. For example, possible areas of use for products classified as “Interior, Dry” include, but are not limited to, indoor shopping malls (excepting food courts), hotel lobbies, office buildings, and showrooms. At the other end of the scale, possible areas of use for products classified as “Oils/Greases” include, but are not limited to, level areas regularly exposed to automotive fluids, “back of the house” fast food or family style restaurants, and food preparation areas with grills or

deep-fry equipment.⁶ While the provided possible areas of use are intended to guide the specifier (i.e. the person choosing the flooring), it is ultimately the responsibility of the specifier to make the project-specific selection. Per A326.3, “*regardless of declared product use classification, specifiers shall determine materials appropriate for specific project conditions, considering by way of example, but not*

⁶ Refer to ANSI A326.3 *Product Use Classification* section for more information on each classification and their corresponding “possible areas of use.”

With the already widespread use of A137.1, A137.2, and A137.3 product standards, the requirement for product use classification is expected to result in better specifications and a reduction in slip incidents, ultimately benefitting all end-users of tile flooring.

in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturer's guidelines and recommendations."

Ceramic Tile Industry: "Stepping" Forward on Slip Resistance

ANSI A326.3 has been widely specified and referred to in the ceramic tile industry for years. After its initial publication, A326.3 was referenced in tile product standards ANSI A137.1, A137.2, and A137.3.⁷ Specifically, the tile standards incorporated the A326.3 specification that level interior spaces expected to be walked upon when wet with water shall have a measured wet DCOF of 0.42 or greater when tested per the A326.3 method. In July 2022, all three ANSI tile standards were updated to require reporting of A326.3 product use classifications, in addition to the 0.42 wet DCOF requirement. Since domestic and overseas manufacturers must report product use to maintain compliance with the tile product standards, incorporating the classifications assures specifiers, builders, and consumers that product use information will be available for every project using ANSI A137.1, .2, or .3 compliant tiles.

All aspects of the tile industry are affected by these changes:

Manufacturing: Manufacturers must assign product use classifications to every flooring product and make that information available on the web, or through package labeling, product literature, or technical data sheets.

Distribution: Importers, distributors, and retailers should check for product use classifications and

make that information available to their customers.

Design: Design professionals should be certain the products being specified are classified by the manufacturer for the intended applications and consider product use criteria explained in the A326.3 standard.

End-Users: Consumers (building owners, homeowners, etc.) should ask for products that meet the ANSI tile product standards, consider only products classified for the intended applications, and seek guidance from design professionals on product selection and maintenance.

About ANSI A326.3

For more information on the ANSI A326.3 standard, its publisher, TCNA, offers the standard free of charge on the TCNA website.

Regarding the adoption of ANSI A326.3 into building code regulations, the International Association of Plumbing and Mechanical Officials' (IAPMO) 2021 Uniform Swimming Pool, Spa & Hot Tub Code (USPSHTC), contains measurable criteria, based on ANSI A326.3, for slip-resistant surfaces around pools, spas, and hot tubs. Similarly, the International Code Council's (ICC) International Swimming Pool & Spa Code (ISPSC) Committee voted unanimously to accept language requiring friction testing per ANSI A326.3 or AS 4586⁸ for products deemed to be "slip-resistant."



⁷ A137.1, A137.2, and A137.3 are the American National Standard Specifications for ceramic tile, glass tile, and gauged porcelain tiles and tile panels/slabs, respectively.

⁸ AS 4586 is an Australian standard titled "Slip resistance classification of new pedestrian surface materials." It contains provisions for testing using a pendulum device.



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PORCELAIN TILE CERTIFICATION AND THE PORCELAIN TILE CERTIFICATION AGENCY (PTCA)

Ceramic tile is defined as a ceramic surfacing unit, usually relatively thin in relation to facial area, having either a glazed or unglazed face and fired above red heat in the course of manufacture to a temperature sufficiently high to produce specific physical properties and characteristics according to the ANSI A137.1 standard. This relatively broad definition encompasses different types of ceramic tile, all of which collectively make up what is commonly known as the “ceramic tile family.”

The ceramic tile family includes:

- Porcelain tile
- Pressed floor tile
- Quarry tile
- Wall tile
- Mosaic tile
- Gauged porcelain tile (GPT)
- Specialty tile

While each of these tile subsets is ceramic tile and thus shares ceramic tile’s general benefits, they are each produced differently and may consequently have additional advantages that lend themselves to specific applications.



Porcelain tile, which according to census bureau data and estimates from the Tile Council of North America (TCNA), accounts for more than 50% of U.S. ceramic tile sales, has emerged as a popular type of ceramic tile.

What is TRUE Porcelain?

What defines and differentiates porcelain tile from non-porcelain tile is its extremely low water absorption. Porcelain tile is a ceramic tile with a water absorption less than or equal to 0.5%.

This definition of porcelain is supported by both the International Standards Organization (ISO) and the American National Standards Institute (ANSI):

ISO definition of porcelain (ISO 13006): Fully vitrified tile with a water absorption coefficient less than or equal to a mass fraction of 0.5%, belonging to groups A1a and B1a

ANSI definition of porcelain (ANSI A137.1): A

ceramic tile that has a water absorption of 0.5% or less that is generally made by the pressed or extruded method; Does not include materials with very little or no crystallinity, such as glass tile (Class P1, E1, or O1)

Manufacturing tiles that meet this standard—true porcelain—requires porcelain-grade clays and other unique raw materials, plus precision milling processes and kilns set to extremely high firing temperatures (2100°F to 2500°F). The required raw materials, energy, and manufacturing equipment needed to produce such low porosity, high density tiles are why real porcelain is typically more expensive than non-porcelain tiles (for tiles with the same decorative elements).

Porcelain Tile Certification Agency

As classified by the ANSI A137.1 ceramic tile standard, porcelain tile is a ceramic tile with a very low water absorption (0.5% or less), as tested per ASTM C373.

While the criteria for porcelain tiles have been well-defined for several decades in North America, the term “porcelain” was undefined in international standards until relatively recently, and the testing method used internationally for measuring water absorption was less rigorous than the ASTM C373 method used in North America.

This led to some tiles being mislabeled as porcelain, whether intentionally or through testing differences. Although the testing standards used worldwide have now been harmonized to the strict requirements in North America, the practice of mislabeling tiles

as porcelain continues. In freeze/thaw and wet environments, that can result in costly failures.

In response, TCNA and the Ceramic Tile Distributors Association (CTDA) jointly established the Porcelain Tile Certification Agency (PTCA) to provide a means for manufacturers and distributors to establish that their products comply with the water absorption criteria for porcelain tile.


PTCA certification was developed to independently evaluate if the program participant understands North American water absorption criteria and can meet such.

For each series being evaluated for porcelain tile certification, five commercially available samples (selected by the participant) are sent for testing once every three years by manufacturing participants and annually by non-manufacturing participants.

The Certification Mark

The Porcelain Tile Certification Agency permits manufacturers whose products meet porcelain certification requirements to label those products with the **Porcelain Tile Certification Agency certification mark**.

By looking for the Porcelain Tile Certification Agency certification mark, distributors, retailers, and consumers can have greater confidence that the products meet the stringent 0.5% or less water absorption requirement defining porcelain tile.



Porcelain tile accounts for more than 50% of U.S. and imported ceramic tile sales.

(Based on census bureau data and estimates from TCNA)

PORCELAIN TILE CERTIFICATION AND THE PORCELAIN TILE CERTIFICATION AGENCY (PTCA)

By participating in the PTCA certification program, the program participant (i.e., the manufacturer and/or seller) is stating that the tiles it produces or sells, labeled with the PTCA mark, meet the ANSI A137.1 porcelain tile water absorption requirements.

Non-manufacturing participants are further required to obtain a written assurance from the actual manufacturer that it will immediately notify the participant of any changes in the conforming porcelain tiles or any manufacturing variances that may affect the certification.

PTCA certification does not mean the tiles tested met all ANSI A137.1 or ISO 13006 criteria, which would require testing for other physical properties such as dimensions, warpage, breaking strength, etc. Variance from those properties has not been an issue in general, and the criteria are well understood.

Importance of Porcelain Tile Certification

The difference between real and false porcelain cannot be detected by eye—the only way to know with certainty is to have a laboratory verify the tile’s water absorption is 0.5% or less. To illustrate the extent of the problem, through its lab, Tile Council has identified hundreds of series from international manufacturers that did not meet the PTCA water absorption criteria necessary to be certified as porcelain.

The Porcelain Tile Certification mark provides an easy way for both distributors and consumers to identify real porcelain tiles. This is crucial for several reasons:

• Trust

Porcelain Certification allows consumers to confidently identify porcelain products. Purchasing products falsely identified as porcelain may lead to failed applications, the need for repairs, and additional costs.

• Cost

When lower-cost products are mislabeled and sold at a higher price as porcelain, the consumers who

How to Certify Porcelain

Manufacturers that want to have their products PTCA-certified must take the following steps:

- 1 Apply for Porcelain Tile Certification by filling out the Program Participation Agreement and the Order Form on the PTCA website. The application involves submitting samples of each tile series to be tested.
- 2 Pay the cost of testing the tile samples at an authorized testing lab, as well as the initial and annual licensing fees.
- 3 Once a participant receives confirmation of their product’s compliance, they can use the PTCA certification mark on product packaging and marketing materials and to help guide the consumer toward a confident purchase of porcelain tile.

purchased such did not receive what they were paying for.

• Success

PTCA certification helps manufacturers and distributors participate in a recognized standard to deliver a consistent product to consumers, paving the way for successful tile installations.

Benefits of the PTCA program

The PTCA program is designed to directly benefit consumers purchasing porcelain tiles and, indirectly, everyone involved in the supply chain.

How the PTCA tests porcelain

When tile is tested to determine its water absorption (the test for porcelain), laboratories follow the American



Because porcelain tile is difficult — if not impossible — to identify by sight, a test for a tile’s porosity (water absorption) will determine if a tile can be called “porcelain.”

Society for Testing and Materials (ASTM) test procedure C373: “Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products.”

ASTM C373 involves testing samples by subjecting them to a strong vacuum while water is drawn into the pores of the tile. The water absorption rate is calculated as a percentage of water weight gained over the dry weight.

Passing the certification testing establishes that the participant understands and can meet North American water absorption criteria. It is not a test of the tile being sold but rather an assessment of the manufacturer. The PTCA certification mark also does not assure fitness of the tile for any particular purpose. The suitability of any tile for specific applications requires an analysis of the project conditions by a qualified individual, as well as proper installation.

For more details on the PTCA program, the PTCA Program Participation Agreement is publicly available and can be found at www.ptcaonline.org/PTCA_Participation_Agreement.pdf.






If a question arises about whether a tile sold as PTCA-certified truly meets the water absorption criteria for porcelain tiles, PTCA is authorized to acquire further samples and test such for compliance. The board of PTCA then reviews the available data and relevant actions taken by the program participant to decide whether to withdraw PTCA certification and use of the mark.

Anyone who suspects a non-porcelain tile is being sold as PTCA-certified tile is encouraged to notify PTCA at 630-942-6588 or info@ptcaonline.org.

ASTM C373 Water Absorption Test

For ceramic tile, water absorption refers to the maximum amount of water that a tile can be made to absorb. In the lab test ASTM C373, water is drawn into the deepest pores of the tile by a strong vacuum.

So, measuring water absorption can also be looked at as measuring available tile porosity—the more water that can be absorbed, the more porous (less dense) the tile.

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
				
Tile sample is dried in an oven to ensure accurate dry weight.	Dried tile sample is weighed using a digital scale accurate to 0.001 gram.	Water is drawn into the tile sample by a vacuum and soaking it.	Saturated tile sample is weighed to determine the amount of weight gain due to absorption of water.	Water absorption is calculated. The change in weight is expressed as the percentage of the tile’s dry weight.

Assurance.




Porcelain certified products can use the PTCA certification mark on product packaging, marketing materials, and more to help guide the consumer toward a confident purchase of porcelain tile.



The Certified Porcelain Tile logo means the tile tested met the American National Standard ANSI A137.1 requirement of 0.5% or less water absorption for porcelain tile.

International Product Assurance Laboratories is the only authorized U.S. lab that performs porcelain certification for PTCA.



International Product Assurance Laboratories
(formerly  *Product Performance Testing Laboratory*)
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www.IPALaboratories.com



TCNA BULLETIN

ACT-CERTIFIED INSTALLERS

More and more, tile setting has become a specialized trade, yet it remains largely unregulated when it comes to requirements for installers, whether for training or for proven adherence to industry standards and best practices. Being mostly unregulated means a contractor may have seasoned, skilled craftworkers or untrained installers with little experience under their belts. Without an established skills baseline, consumers are limited in their ability to differentiate between contractors and often choose based on the lowest bid—too often selecting unqualified companies.

ACT (Advanced Certifications for Tile Installers) seeks to improve this situation and has established a skills baseline that allows consumers to compare installer qualifications.

Launched in 2013, ACT is a comprehensive program of written and hands-on testing for nine defined skill sets. While other training and certification programs may be available to tile installers, ACT has garnered wide support from the tile industry because it is standards-based and highly demanding.

ACT tests are not show-up-for-a-seminar and get-your-certificate events. ACT certification tests have strictly enforced time limits and installers' hands-on work is evaluated and scored in-person by trained and impartial evaluators following a specific evaluation protocol. Upon completion of the hands-on component by the installer, the evaluator literally tears it apart. By removing tiles and examining fresh mortar beds, ACT evaluators judge what's seen on the surface as well as what is under the surface—a crucial component of the program, as so much of what is required for a successful tile installation lies beneath the finished tile work. That level of rigor ensures only those with the required knowledge and skill are certified. Invariably, some installers do not pass, because of the time limit, errors made in the tile installation, or mistakes on the written exam.

The ACT program operates through the combined efforts of the six leading organizations in the tile industry: The Ceramic Tile Education Foundation (CTEF), the International Masonry Institute/International Masonry Training and Education Foundation (IMI/IMTEF), the International Union of Bricklayers and Allied Craftworkers (IUBAC), the National Tile Contractors Association (NTCA), the Tile Contractors Association of America (TCAA), and the Tile Council of North America (TCNA). ACT tests are administered by CTEF and IMI/IMTEF.



ADVANCED CERTIFICATIONS FOR TILE INSTALLERS

GAUGED PORCELAIN TILE

Specify ACT GAUGED PORCELAIN TILE certification on every job where gauged porcelain tile panels/slabs are used.

Critical Installation Skills Tested: Proper substrate prep, handling, layout, cutting, use of edge profiles, and setting gauged porcelain tile panels and slabs.

GROUTS A118.3, A118.6, and A118.7

Specify ACT GROUTS certification on every job where cementitious grout or epoxy grout will be used.

Critical Installation Skills Tested: Proper product selection, mixing, installation, and grout cleanup.

LARGE FORMAT TILE / SUBSTRATE PREP

Specify ACT LARGE FORMAT TILE certification when tile 15" and longer will be installed by a thin-set method.

Critical Installation Skills Tested: Flattening the substrate and installing tile within industry standards for flatness, mortar coverage, proper offset in running bond applications, grout joint consistency, and lippage.

MEMBRANES A118.10 and A118.12

Specify ACT MEMBRANES certification when a sheet or liquid membrane will be used for waterproofing or crack isolation.

Critical Installation Skills Tested: Application of sheet, single component, and fabric-reinforced liquid applied membranes with emphasis on avoiding installation errors that affect the integrity of the waterproofing.

MUD FLOORS - F111

Specify ACT MUD FLOORS certification when a mortar bed has been selected as the substrate for tiling floors.

Critical Installation Skills Tested: Installing floor mud to ANSI standards, with emphasis on proper materials and precision, with the finished work being a flat and level mud bed.

MUD WALLS - W222

Specify ACT MUD WALLS certification when a mud bed has been selected as the substrate for tiling walls.

Critical Installation Skills Tested: Installing wall mud to ANSI standards, with emphasis on proper materials, movement joints, and finished work being precise, flat, plumb, and square.

SHOWERS - B415

Specify ACT SHOWERS - B415 certification when designing "water in/water out" showers with a mortar bed and tile floor over a shower-pan membrane.

Critical Installation Skills Tested: Creating a watertight (leak-proof) continuously sloped mortar bed over a shower pan membrane.

SHOWERS - B421

Specify ACT SHOWERS - B421 certification when designing bonded waterproof membrane showers over sloped mortar bed floors and solid backing walls.

Critical Skills Tested: Creating watertight (leak-proof) shower walls over solid backing and a continuously sloped mortar bed.

ACT Certification: SHOWERS - B421C

Specify ACT SHOWERS - B421C certification when designing barrier-free showers on a concrete substrate with a mortar bed floor and solid backing walls using a bonded waterproof membrane.

Critical Skills Tested: Creating a watertight (leak-proof) shower assembly without a curb and a continuously sloped mortar bed.

TCNA BULLETIN

CHOOSING YOUR TILE CONTRACTOR



TILE. It's the go-to finish when you're looking for high fashion and high function. But you might not get either if you leave it to just anyone to install. Unlike plumbing, electrical, and structural masonry trades, tile installers and the tile contractors that employ them are not generally required to meet minimum trade craft criteria to be in business.

The difference between trained, experienced installers and inexperienced installers is noticeably reflected in their work, and the difference between a quality contractor and a deficient one is reflected in their service and business operations.

Together, contractor and installer transform your concept into reality. Whether you're a design/build professional selecting tile contractors on a regular basis or a homeowner with a single tile project, it's just not possible to overestimate the importance of finding qualified contractors and installers.

The Reputable Tile Contractor

- ✓ **Operates a legitimate business**, with responsible business practices and a policy of standing behind their work.
- ✓ **Invests in continuing education** necessary to stay up-to-date on current building codes, regulations, standards, and best practices. On-the-job training is the most popular way to learn a construction trade, but formalized training is a must for ensuring correct installation methods are being taught to and used by installers on your project.
- ✓ **Carries all required business licenses and insurances**, and doesn't push liabilities for property damages or worker injuries onto others.
- ✓ **Does not misclassify workers** to avoid paying into social security, unemployment, workers' compensation, and other employee programs.
- ✓ **Has a traceable business location** so customers can be sure post-installation questions and issues are addressed and resolved.
- ✓ **Has a track record for quality and service:** Good contractors can easily produce references and verifiable documentation of their commitment to quality and service.

Architects and Specifiers

Include language in job specifications requiring qualified labor and enforce it with the GC. See the TCNA Handbook for a list of industry recognized prequalification programs for installers and contractors such as the CTEF Certified Tile Installer Program, the ACT (Advanced Certifications for Tile Installers) Program, the NTCA Five-Star Contractor Program, and the TCAA Trowel of Excellence Program.

General Contractors

Deliver a quality tile installation by fulfilling contractor qualification requirements in job specifications. When not included, utilize internally developed qualifications. Require proof of qualifications to be included with all project bids and thoroughly compare estimates from bidding contractors before awarding contracts. Often, higher estimates reflect better materials and additional necessary components and tasks, like substrate preparation and movement joints.

Homeowners

Don't hesitate to ask contractors for proof of insurance, their license (where required), and their installation qualifications. Thoroughly interview bidding contractors and check several references. Utilize consumer resources available from your state on the internet and from the Ceramic Tile Education Foundation.



Call CTEF at 864-222-2131 or visit CeramicTileFoundation.org for assistance finding or specifying a quality contractor.



“Because tile is a permanent finish, the lowest bid should not be the driving factor, but rather who is the most qualified to perform the scope of the work specified.”

— TCNA Handbook



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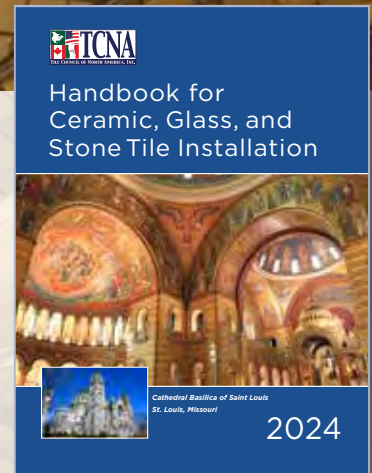
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ANSI A137.1
product performance—
ceramic and glass tile



ANSI A108, A118, A136
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Guastavino tile circa 1909, Bridgemarket, New York City
Photo: Michael Freeman



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PREPARE FOR SUCCESS



ANSI A137.3, A108.19 and A108.20

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ANSI A137.2



ANSI A137.1



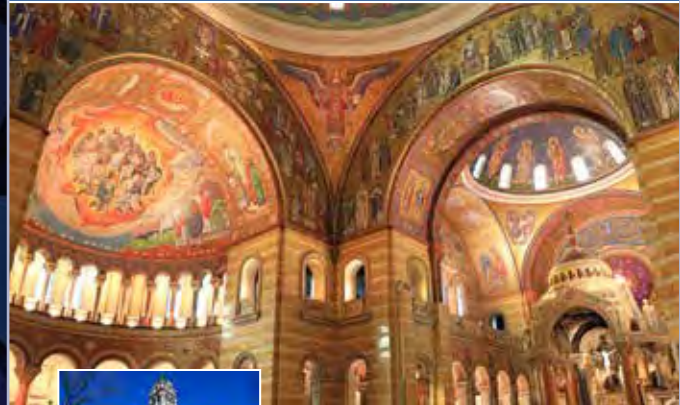
ANSI A108, A118, and A136



ANSI A137.3, A108.19 and A108.20



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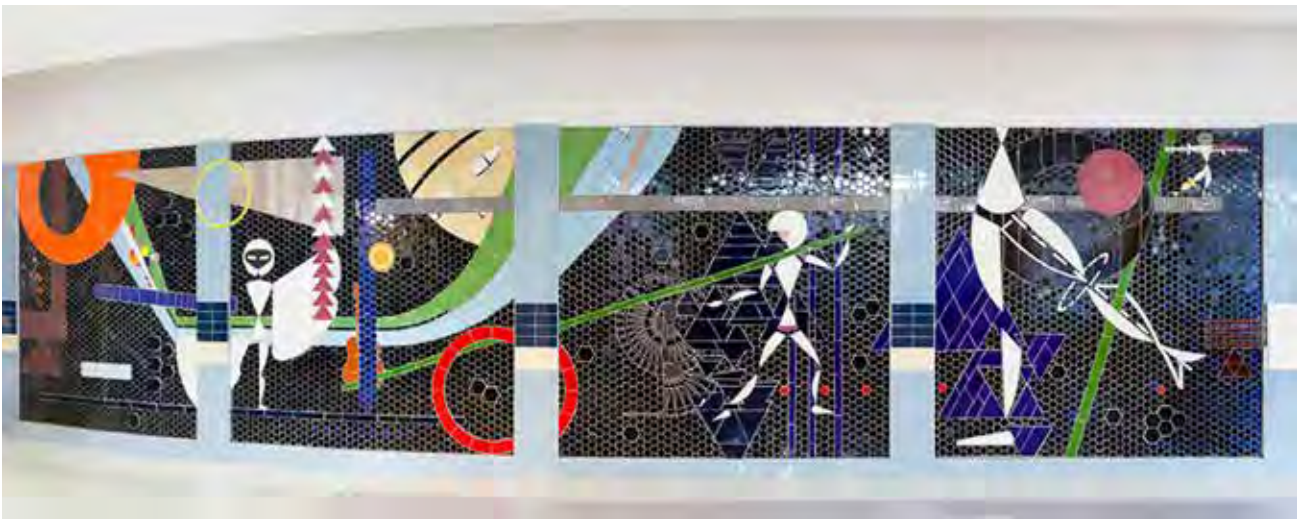
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Tile Heritage Foundation Guardian of American Tile History

Tile Heritage Foundation was established in 1987 as a member-supported, not-for-profit organization whose sole purpose is to protect and preserve the history of the American Tile Industry. Tile Heritage is dedicated to promoting an awareness and appreciation of ceramic surfaces in the United States. The Foundation serves as a repository, an archive, which embraces all aspects of the industry from its inception in the 1870s through to the present time, validating its significance for posterity.

In the past 37 years the Tile Heritage Foundation has developed an archive for the tile industry in the United States. In addition to the “books and letters” in its library, Tile Heritage storehouses a collection of historic American tiles, all one of a kind, from scores of different companies, some dating back to the late 19th century as well as tiles from contemporary artisans. In addition, there are collections of historic documents, tile catalogs and tile-related books and periodicals covering a period of 135 years. The Foundation has also archived approximately 140,000 images of individual tiles as well as of installations from around the country and from around the world!



Mural designed by artist **Ohad Meromi**. Fabricated and installed by NY, Tilemakers for a public school in NYC. The mural consists of four panels along a curved wall for a total of 324 square feet.

Fundamentally, ceramic tiles are designed and manufactured to be installed. In this snapshot of the Tile Heritage image collections, we'll share some exceptional historic and contemporary installations from around the continent. Unless otherwise stated, the images are from the Tile Heritage collection.

Rest assured that this archive and the collections belong to ALL OF US!

The Delaware, Lackawanna and Western Railroad Station, Scranton, PA. Architect: Frank J. Neis. This historic structure was built in 1908 as a train station and office building. It is now a hotel. Original elements remain in this restored building including the Grueby Faience tile panels.



Two of thirty-six Grueby Faience tile panels in the interior of the Lackawanna Station, Scranton, PA.



Bok Tower Gardens, Lake Wales, FL. Architect: Milton B. Medary. **Bok Tower**, completed in 1929, is located on the state's highest point, 298 feet above sea level. The historic bell tower houses one of the world's great carillons with 57 bronze bells. The polychrome grilles that adorn the exterior as well as the colorful floor tiles were produced at the Enfield Pottery and Tile Works.



The Nebraska State Capitol, Lincoln, NE. Designed by Architect Bertram Grosvenor Goodhue in 1920, the dome interior has a masonry vaulted ceiling with acoustic tile soffit produced by the R. Guastavino Company, (Boston & New York). The marble floor mosaics were designed by Hildreth Meiere.

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The Foundation's Archive holds hundreds of valuable records including thousands of historic and contemporary image files.



“The Seven Stages of Man,” designed and crafted in the mid-1950s by Carl Zimmerman in ceramic mosaic from the Cambridge Tile Manufacturing Co. for the library at Princeton High School in Sharonville, Ohio, a suburb of Cincinnati.

“... we have built a storehouse and filled it with books and letters, written and printed, private and public, a storehouse ever full, holding in trust all the dreams . . . sheltering hopes and wisdom, recording trials, failures and accomplishments.”

— Carl Zimmerman (1900-1985), Professor of Art at the University of Cincinnati

In like manner, the Tile Heritage Foundation has developed an archive for the tile industry in the United States. In addition to the “books and letters” in its library, Tile Heritage storehouses a collection of historic American tiles, all one of a kind, from scores of different companies, some dating back to the late 19th century as well as tiles from contemporary artisans. Add to this the collections of historic documents tile catalogs and tile-related books and periodicals covering a period of 135 years.

Rest assured that this archive and the collections belong to ALL OF US!

MARINE BUILDING, Vancouver BC, Canada.

Architects: McCarter and Nairne. A spectacular Art Deco steel-frame building with much buff brick as well as terra cotta panel facia. Construction was completed in October 1930. The interior lobby is graced with tiles made by Batchelder-Wilson in Los Angeles. The Marine Building is an Art Deco Masterpiece in North America.



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Powell Library, UCLA, Los Angeles, CA. Completed in 1929, the building architecture is Italian Romanesque Revival designed by architect George W. Kelham, a partner with Bernard Maybeck and Julia Morgan. The fascia is of brick and stone with large inlays of ceramic tile and terra cotta which were produced by Gladding, McBean & Co. in Lincoln, CA.



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The Pier Mural in front of the 'CEARTE', the Arts Center of Ensenada, Mexico, was installed in 2012. Artist, designer: Estella Hussong. The 651 tile mural was painted by Hussong, an artist with an international reputation. The tiles were made and the mural fabricated by ceramist Ivette Vaillard of Val de Guadalupe, Mexico. Images by Ivette Vaillard.





TILE HERITAGE FOUNDATION PLANNED GIVING

As a Legacy Friend you can have a lasting impact on tile history preservation by leaving a gift to Tile Heritage Foundation in your will, trust or by beneficiary designation. Your generosity will help protect the archives and collections of American tile history.

A gift provides financial strength to current operations and future development and will have an impact on preserving American Tile

DETAILS: endowment.tileheritage.org



HOW DO YOU BENEFIT from pledging a legacy gift?

- You can provide for your loved ones first and make a gift to Tile Heritage.
- You pay nothing now and retain control of your assets during your lifetime.
- If your needs change, you can change your mind at any time.
- You can be recognized or remain anonymous.
- You can leave a gift in honor or memory of someone who inspired your dedication to tiles and tile history.
- You can ensure that your generosity is felt by future generations.

Note: Tile Heritage Planned Giving is managed by Foothills Community Foundation.
<https://foothillscommunityfoundation.org>

A broad funding base is essential for the long-term sustainability of Tile Heritage. Sponsorship and Membership have always provided the core of the Foundation's stability. TEAM UP WITH TILE HERITAGE TODAY!! Web: www.tileheritage.org Email: foundation@tileheritage.org



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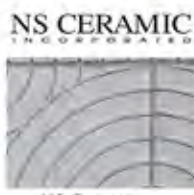
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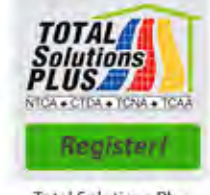
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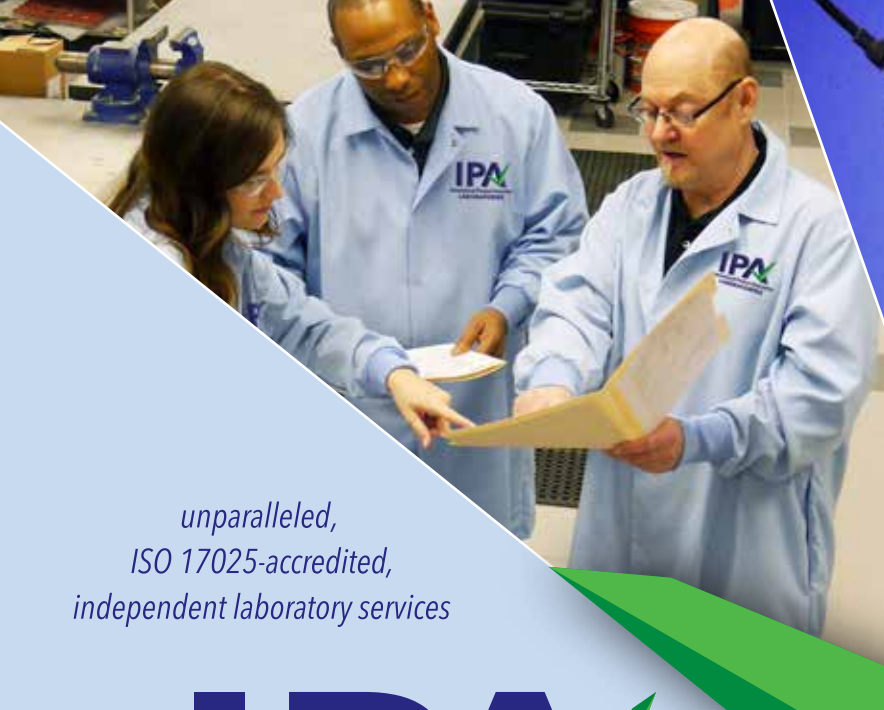
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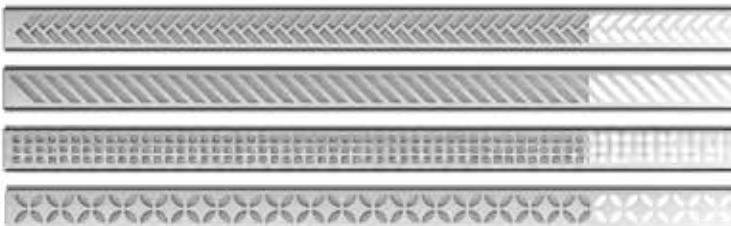


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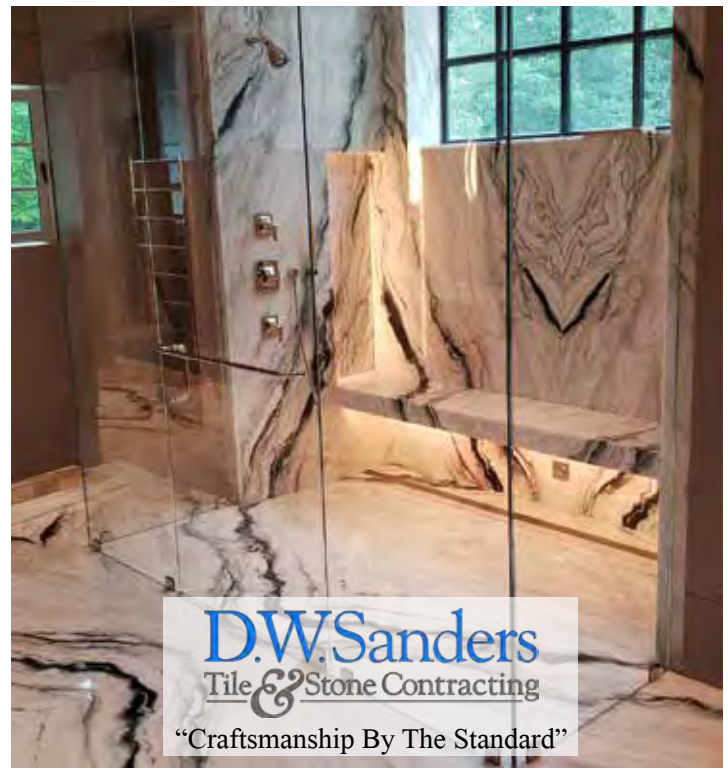


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NTCA Five-Star Contractors and TCAA Trowel of Excellence Contractors

*are uniquely qualified to
provide the craftsmanship
and service you deserve.*



The Tile Council of North America Handbook strongly recommends using installers who have demonstrated their commitment to their craft.

Because tile is a permanent finish, the lowest bid should not be the driving factor, but rather who is the most qualified to perform the scope of the work specified.

TCAA Trowel of Excellence and NTCA Five Star Contractors have a proven track record of success for both residential and commercial installations. These companies have demonstrated their commitment to professionalism by passing rigorous review of their training, management and safety practices and enjoy strong support from peers, customers and suppliers.

Contact the NTCA and TCAA for qualified Five Star and Trowel of Excellence contractors for your upcoming project.



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- Publications, posters, and prepared monthly social media posts to use in your own campaigns and communications
- Presentations for your use that convey the benefits of ceramic tile over other surface materials and explain industry issues and advancements

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