

2014

Tile Initiative

STANDARDS. SCIENCE. EDUCATION. ADVOCACY.



Standards

- Leading Association for National and International Standards for Tile, Installation Materials, and Sustainability
- Secretariat of ANSI Accredited Standards Committee A108 and ISO Technical Committee 189
- Editor and Publisher of the *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation*

Science

- Largest Independent Tile and Installation Materials Testing Laboratory in North America
- Leading Research Partner in the Development of Standards

Education

- Founding Partner in Installer Education and Certification Programs in the U.S. and Mexico
- Promoting Tile's Superior Sustainability through the Green Squared® Standard
- Provider of Quarterly Tile Industry Economic Reports
- Regular Contributor to Industry Journals

Advocacy

- Promoting Tile Industry Interests in Legislative and Regulatory Matters
- Government Watchdog for Trade and Import Issues

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The advertisements in this issue come from the Signature Level and Platinum Level sponsors of the Ceramic Tile Education Foundation (CTEF). Their generous donations enable the administration and growth of CTEF's educational and certification programs for tile installers and other tile industry professionals. These programs benefit the construction industry and tile-consuming public by facilitating a higher level of craftsmanship in tile installation and a means of identifying qualified installers in the trade. For more information, visit tilecareer.com. All of the funds received go directly to CTEF with the cost of printing donated by the Tile Council of North America (TCNA), publisher of the *TCNA Handbook*.

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Know your number?



Know your number.

The standard for coefficient of friction (COF) for tile floors has changed. Whether you're manufacturing, specifying, selling, installing, or maintaining ceramic tile floors, it's important to know the COF of your floor tile according to the new standard and test method, the DCOF AcuTest.[®] Our lab not only runs this test, we helped develop the protocol. Send us your tiles today, and be sure you're meeting this new and very important safety standard.

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TCNA ALERT

COEFFICIENT OF FRICTION (COF) STANDARD FOR CERAMIC TILE

DON'T SLIP UP WHEN IT COMES TO SAFETY!

Update your tile specs with new COF requirements including the following: Tiles suitable for level interior spaces expected to be walked upon when wet shall have a wet DCOF of 0.42 or greater when tested per the DCOF AcuTest.®

The ANSI A137.1 standard for ceramic tiles now states, “The specifier shall determine tiles 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.”

If you’re specifying, selling, manufacturing, installing, or maintaining ceramic tile floors, it’s important to know about recent changes to the coefficient of friction (COF) requirements in the ANSI standard. Project plans and specifications, maintenance programs, etc., referencing a minimum COF of 0.6 per ASTM C1028 (the old COF test method) do not meet the new requirements of the standard, which went into effect late in 2012.

To meet the new DCOF AcuTest criteria, you cannot use old COF values from C1028 measurements. The test methodologies are different, and accordingly, there is no direct correlation between specific C1028 COF values and the values measured by the DCOF AcuTest. Additionally, ASTM C1028 has been withdrawn, effective February 1, 2014.



Don't slip up when it comes to safety!
For the full text of the COF standard
and additional information, visit
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TCNA BULLETIN

WHAT IS TRUE PORCELAIN?

The difference between real and false porcelain cannot be detected by eye. . . . Suppliers of falsely-labeled porcelain are defrauding the consumer and benefitting from the popularity and market value of genuine porcelain.



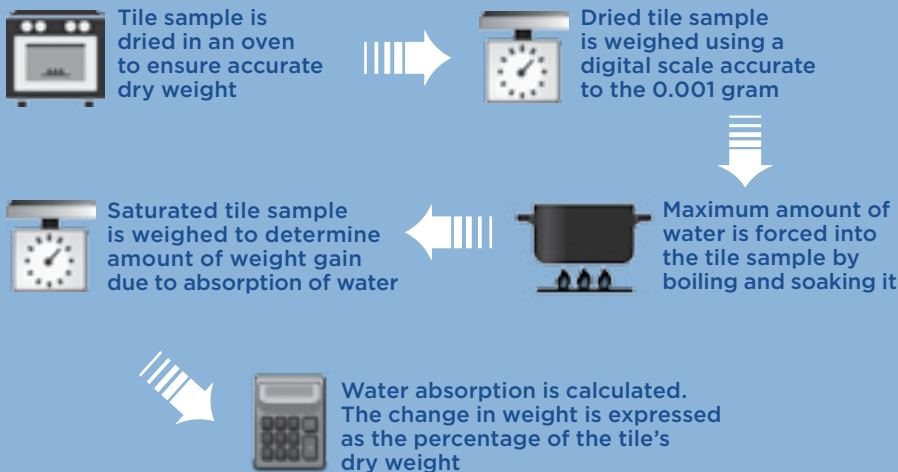
Tile Council is a partner in the Porcelain Tile Certification Agency (PTCA), a non-profit consumer protection group that combats falsely-labeled non-porcelain tiles through its certification and labeling program for manufacturers and sellers of genuine porcelain tile. For a list of certified porcelain product lines and more information, visit www.ptcaonline.org.

Porcelain tile has become increasingly popular over the past decade. The American National Standard Specifications for Ceramic Tile (ANSI A137.1) require tile to have a water absorption of 0.5% or less to be classified as porcelain, when tested per ASTM C373, the most stringent test for measuring water absorption. Manufacturing tile that meets 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 2300°F). The required raw materials, energy, and manufacturing equipment needed to produce such low porosity, high density tile are why real porcelain is typically more expensive than non-porcelain tile.

The difference between real and false porcelain cannot be detected by eye — the only way to know is to have a laboratory verify the tile's water absorption is 0.5% or less. Through our lab, Tile Council has identified more than one hundred falsely-labeled "porcelain" tiles with a water absorption well over 0.5% — sometimes as high as 3%. Suppliers of falsely-labeled porcelain are defrauding the consumer and benefitting from the popularity and market value of genuine porcelain. This is particularly true for imported tile, and, considering that more than 70 percent of the tile sold in the United States is imported, much of the "porcelain" being sold may be falsely labeled.

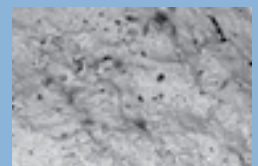
ASTM C373 Water Absorption Test

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 forced into the deepest pores of the tile. 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.

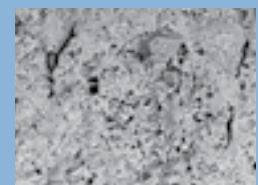


TILE POROSITY MAGNIFIED 200X

Photos courtesy of TCNA Laboratory



0.39% water absorption



5-6% water absorption

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 & 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 5-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. 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 tilecareer.com 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*

TCNA REPORT

WHEN QUALITY IS THE BOTTOM LINE: MATCH ACT-CERTIFIED INSTALLERS TO THE JOB AT HAND

Tile setting isn't like it used to be; it has become a more and more specialized trade. Yet it remains largely unregulated when it comes to requirements for installers, whether for training or for proven adherence to best practices and industry standards. The easy entry into tile setting means the contractor bidding on your job could have seasoned, skilled craftworkers or untrained installers with little experience under their belts. And, without an established skills baseline, the contractors that don't invest in installer training and education have a competitive edge if the only consideration for choosing from a pool of tile contractors is which one has submitted the lowest bid, the norm for the vast majority of commercial work today.

This is the system for awarding tile jobs — too often to unqualified companies — that the tile industry is waging war against through a new program called ACT (Advanced Certifications for Tile Installers).



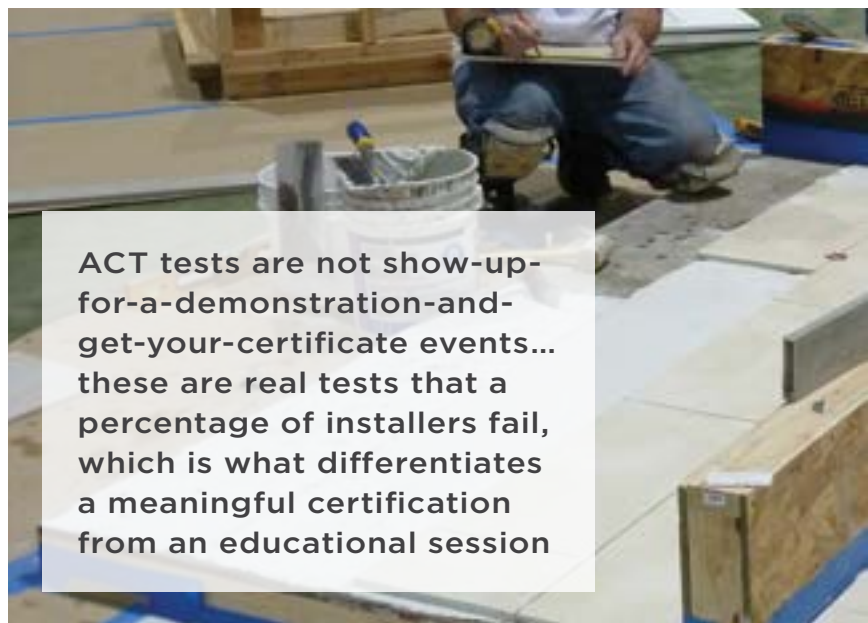
ADVANCED CERTIFICATIONS FOR TILE INSTALLERS

Launched in early 2014, ACT is a set of written and hands-on tests for five defined skill sets: installation of a shower base, waterproof/crack isolation membrane installation, wall mud, floor mud, and large-format tile installation, which includes substrate preparation. Testing was developed around these specialized facets of installation because they were identified as crucial skills that require proven — not presumed — proficiency, when needed for a given project. Installers can take any or all of the ACT tests to suit their experience and the types of work they do well. Likewise, project specs can call out the applicable certifications needed.

While other training and certification programs are available to tile installers, the ACT program has garnered wide support from the tile industry at large because it is standards-based and highly demanding. The written and hands-on tests

have strictly enforced time limits, and installers' hands-on work is personally evaluated and scored by trained, approved evaluators, all of whom have a solid, successful installation background of their own. Photos of the completed test modules, including close-ups, are submitted by the evaluators to substantiate their scoring and to facilitate additional evaluation by others off site. Upon completion of a hands-on test module by the installer, the evaluator literally tears it apart. By prying up tiles and probing fresh mortar beds, ACT test evaluators judge what's below the surface, a crucial component of the program, as so much of what is required for a successful tile installation lies below the finished tile work. Each hands-on test includes "critical required points" that the installer must meet fully in order to pass. These are things that would cause or contribute to a failure in the real world, like a shower pan membrane that does not pass a leak test.

To summarize, the ACT tests are not show-up-for-a-demonstration-and-get-your-certificate events. Before taking a test, an installer receives the applicable industry standards and a guide that outlines the materials and components of the test, and he or she must use these to prepare and show up ready to go. Test evaluators do not demonstrate proper technique or give installers pointers as they work. In short, these are real tests that a percentage of installers fail — this is what differentiates a meaningful certification from an educational session that comes with what is no more than a certificate of attendance.



ACT tests are not show-up-for-a-demonstration-and-get-your-certificate events... these are real tests that a percentage of installers fail, which is what differentiates a meaningful certification from an educational session

Construction and building design professionals are encouraged to integrate such installer qualifications as requirements for the contractors bidding the project, in the quality assurance section of the specifications. Requiring evidence of program completion or certifications in the submittals section is recommended to help ensure the specified requirements for installers are met.

ACT tests are administered by the Ceramic Tile Education Foundation (CTEF) and the International Masonry Institute (IMI), which collaborated to develop the program, with support from product manufacturers and industry organizations including the National Tile Contractors Association (NTCA), Tile Contractors Association of America (TCAA), Tile Council of North America (TCNA), and the International Union of Bricklayers and Allied Craftworkers (IUBAC). To be eligible to take an ACT test, an installer must first earn his or her Certified Tile Installer (CTI) credential through CTEF, a certification of proficiency in fundamental thin-bed installation, or, he or she must be a U.S. Department of Labor recognized Journeyman Tile Layer, a designation typically achieved through a union-administered apprenticeship program.



Photo: David Federoff

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TCNA REPORT

WHEN QUALITY IS THE BOTTOM LINE: MATCH ACT-CERTIFIED INSTALLERS TO THE JOB AT HAND



ACT Certification: **LARGE FORMAT TILE**

When to Specify: Specify ACT LARGE FORMAT TILE certification when tile larger than 14" long will be installed by a thin-bed method

Critical Installation Skills Tested: Flattening a substrate to receive large tile and installing large tile within industry tolerances for coverage, flatness, and lippage

- Evaluate flatness of substrate and remediate, as necessary, using floor patch/leveler
- Achieve minimum 80% contact of bonding mortar to tile and substrate, as required by ANSI standards
- Lay tile in 33% offset pattern as required by ANSI standards for large tile
- Produce finished work with minimal lippage



ACT Certification: **MEMBRANES**

When to Specify: 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 and liquid membranes with emphasis on avoiding common installation errors that affect waterproofness

- Create properly folded, square in-corners and out-corners
- Flash membrane up round floor penetration (pipe)
- Properly integrate membrane to floor drain assembly
- Overlap and properly seam sheet membrane
- Apply liquid membrane to achieve proper mil thickness



ACT Certification: **SHOWERS**

When to Specify: Specify ACT SHOWERS when designing showers with a mortar bed and tile floor over a shower-pan membrane

Critical Installation Skills Tested: Creating a watertight (leak-proof) shower base that effectively evacuates water

- Install sloped pre-fill under shower pan membrane
- Maintain open weep holes to allow water passage
- Maintain watertightness by keeping all fasteners well above water exposure level
- Form shower pan membrane by folding (not cutting) corners
- Wrap curb completely with shower pan membrane; fasten on outside only
- Tightly connect shower pan membrane to drain housing
- Pass leak test

ACT Certification: MUD WORK, WALLS AND FLOORS

When to Specify: Specify ACT MUD WORK, WALLS when tile on walls will be installed over a mortar bed, and specify ACT MUD WORK, FLOORS when tile on floors will be installed over a mortar bed

Critical Installation Skills Tested: Mixing and installing wall and floor mud to ANSI standards

- Install cleavage membrane and reinforcing
- Meet minimum and maximum allowable thickness
- Create flat, level mortar bed floor and flat, plumb mortar bed walls
- Form square in-corners and out-corners
- Maintain precise dimensions and uniformity



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SUSTAINABILITY UPDATE

THE EPD FOR TILE MADE IN NORTH AMERICA

THE NEXT CHAPTER IN SPECIFYING SUSTAINABLE FLOORING IS HERE

Specifiers and other building design and construction industry professionals seeking sustainable flooring options can now look to the North American ceramic tile EPD, the first in the industry, to evaluate and understand ceramic tile's environmental footprint. An EPD (Environmental Product Declaration) is a report that quantifies the environmental impacts of a product throughout its life cycle. It contains information about a product's carbon footprint and resource depletion potential, among other things. An EPD is not intended to be a claim of environmental superiority. Rather, it is similar in concept to nutrition reporting. An EPD tells a product's complete environmental story in a standardized format that allows products to be compared to each other, much as nutritional labels allow food products to be compared. As a result, EPDs have become increasingly popular, a "must-have" for some, because they provide the detail and transparency needed to facilitate informed buying decisions.

The North American tile EPD is a comprehensive analysis of over 95% of the ceramic tile produced in North America, based on data collected by PE International and verified and certified by UL Environment, both well-established leaders in the field of sustainability assessment and certification.



THE NORTH AMERICAN TILE EPD BRINGS IMMEDIATE BENEFITS:

- Tiles made by the North American manufacturers whose products and operations were evaluated for the composite EPD will contribute towards points in LEED and other green building standards and rating systems, including future versions of the International Green Construction Code (IgCC).
- Having submitted data for the composite EPD, participating manufacturers will start to develop and release product-specific EPDs, which will qualify those products to additionally contribute towards points in LEED and other green building standards and rating systems.
- The sustainability and environmental impacts of North American tile can be directly compared to other flooring products that have an EPD.
- Transparency and technical detail on the sustainability of North American tile, based on industry-wide life-cycle data, will for the first time be available. Increasingly, this is being requested by the green building community.

The tile EPD is based principally on a life cycle assessment (LCA), which addresses myriad aspects of ceramic tile: sourcing and extraction of raw materials; manufacturing processes; health, safety and environmental aspects of production and installation; production waste; product delivery considerations like distances to typical markets; use and maintenance of the flooring; and end of product life options such as reuse, repurposing, and disposal.

To ensure products are compared fairly and definitively, Product Category Rules (PCRs) are used. These rules establish the framework for how evaluations must be made, what information must be reported, and how declarations must be organized within a common category of products. This prevents green washing because the rules require that all included parameters and impacts be reported, not just those for which a product type performs the best. The ceramic tile EPD follows the same PCRs used for carpet, resilient tile, laminate, and wood flooring, allowing all flooring products to be compared.

Because the PCRs require consistent reporting, end users can select products based on the specific criteria of importance to them.

Developing a North American ceramic tile EPD was a natural next step for the Tile Council of North America, which launched Green Squared® in 2012 to provide multi-attribute sustainability evaluation criteria for tile and installation materials and a means — Green Squared Certification — of easily identifying the most sustainable tile products available.

When selecting sustainable products, two important considerations can now be made: 1) Compliance with multi-attribute criteria; and 2) Evaluation based on a life cycle assessment as reported through the North American ceramic tile EPD. Together, they serve as useful product selection tools that make the design professional's job easier when building green.



This Is How We Will Floor You

Florida Tile's commitment to quality stands for itself. With some of the most advanced technology in tile production, we have challenged ourselves to produce the best products in the industry. Porcelain tile should be strong yet beautiful, sustainable and a great value that will last for years to come. Our line of HDP High Definition Porcelain brings our attention for detail to the surface. From our home in Kentucky, we manufacture 95% of our tile lines which contain at least 40% recycled content. For more information visit our website.



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GOT LEED? GET TILE!

A GUIDE TO LEED v4 AND TILE

LEED (Leadership in Energy and Environmental Design) green building rating systems allow builders, owners, and tenants to evaluate the overall sustainability of their projects. Points toward LEED certification can be obtained by making sustainable choices while designing, constructing, and operating a new or existing building or major renovation. In LEED Building Design and Construction (BD+C) v4, there are 110 possible points. Through auditing by the U.S. Green Building Council (USGBC), the organization that developed LEED, a building can be awarded a certification ranging from LEED Certified (40-49 points) to LEED Platinum (80-110 points).

The building materials and systems chosen for a project play an important role in satisfying requirements needed to attain certification, and using ceramic tile can be quite advantageous. The precise number of points earned depends on many factors and varies widely depending on project particulars; nevertheless, sustainable applications for tile are virtually endless, limited only by the imaginations of architects, designers, and budgets. Some credits, requirements, and other details do not appear below; this was done solely for the sake of clarity and relevance to tile and installation products.

This guide explains how ceramic tile can be integrated into projects that meet the criteria for pertinent LEED Credits in six LEED Credit categories: Integrative Process; Materials and Resources; Indoor Environmental Quality; Sustainable Sites; Energy and Atmosphere; and Innovation.

Green Squared Certified products have extensive sustainability attributes that can help fulfill a broad range of LEED v4 criteria.

LEED points may be earned using a variety of approaches, and many factors can greatly influence the overall sustainability of any project. Work with product representatives from the North American tile industry, many of whom are LEED Accredited Professionals (LEED APs), to help you better understand how tile installations can be integrated into projects to help achieve the desired sustainability and certification.

FIND IT FAST

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Building materials and systems chosen for a project play an important role in satisfying requirements . . . using ceramic tile can be quite advantageous.



*Vaulted ceiling with Guastavino tiles,
Manhattan Municipal Building,
New York City, completed in 1914*



LEED v4 CREDIT CATEGORY

MATERIALS AND RESOURCES

BUILDING LIFE-CYCLE IMPACT REDUCTION

STATED INTENT: *“To encourage adaptive reuse and optimize the environmental performance of products and materials.”*

PERTINENT REQUIREMENTS:

Option 1: Historic building reuse

- Maintain the existing building structure, envelope, and interior nonstructural elements of a historic building or contributing building in a historic district.

Option 3: Building and material reuse

- Reuse or salvage building materials from off site or on site as a percentage of the surface area. Include structural elements (e.g., floors, roof decking), enclosure materials (e.g., skin, framing), and permanently installed interior elements (e.g., walls, doors, floor coverings, ceiling systems).

Option 4: Whole-building life cycle assessment

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Tile's inherent durability makes it one of the few interior surface coverings that can be reused in renovations without refinishing. Often, preservationists enthusiastically incorporate exquisite historic tile installations into building restorations, celebrating the industry's rich, artistic heritage.

Tile's 60+ year lifespan and minimal environmental footprint offer significant advantages in a whole-building life cycle assessment. And because Option 4 requires material selection based on a 60-year whole-building life cycle assessment, specifying tile is an ideal way to contribute to this requirement.

BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION — ENVIRONMENTAL PRODUCT DECLARATIONS

STATED INTENT: *“To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.”*

PERTINENT REQUIREMENTS:

Option 1: Environmental product declaration (EPD)

Use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.

- Products with a product-specific, publicly available life cycle assessment (LCA)
- Products with an industry-wide (generic) EPD
- Products with a product-specific EPD

Option 2: Multi-attribute optimization

Use products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project.

- Products that demonstrate impact reduction below industry average in at least three impact categories

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

To ensure that tile is taken into consideration when making EPD-based product comparisons, TCNA released an industry-wide EPD in 2014 that provides a third-party verified, comprehensive analysis of the majority of ceramic tile produced in North America. This EPD is based on a life cycle assessment (LCA) that addresses everything from sourcing and extraction of raw materials to end of product life options.

Some tile products that were included in the generic EPD have proprietary life-cycle data available, and those that demonstrate impact reduction below industry average can further contribute to this Credit.

BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION — SOURCING OF RAW MATERIALS

STATED INTENT: *“To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.”*

PERTINENT REQUIREMENTS:

Option 1: Raw material source and extraction reporting

AND/OR

Option 2: Leadership extraction practices

Use products that meet at least one of the responsible extraction criteria listed below for at least 25%, by cost, of the total value of permanently installed building products in the project.

- Extended producer responsibility (EPR)
- Materials reuse
- Recycled content

Products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Query North American tile or related installation material manufacturers about whether or not sustainability reports are available from their raw material suppliers.

Tile can also fulfill responsible extraction criteria:

- Some North American tile manufacturers practice extended producer responsibility (EPR) through “take-back” programs
- Tile’s inherent durability makes it a great option as a reused or salvaged material (i.e. refurbished product), especially in decorative applications.
- The production of tile and related installation materials often incorporates pre- and post-consumer recycled content. Responsible extraction practices, including the use of recycled or reclaimed waste material in manufacturing, are required of Green Squared Certified products.

With tile and related installation material manufacturing facilities located in nearly every region of North America, regionally manufactured products are likely available, and those meeting the above provisions can double their contribution to satisfying the requirements of this Credit.

BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION — MATERIAL INGREDIENTS

STATED INTENT: *“To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.”*

PERTINENT REQUIREMENTS:

Option 1: Material ingredient reporting

Use at least 20 different permanently-installed products from at least five different manufacturers that demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm).

AND/OR

Option 2: Material ingredient optimization

Use products that document their material ingredient optimization for at least 25%, by cost, of the total value of permanently installed products in the project.

AND/OR

Option 3: Product manufacturer supply chain optimization

Use building products for at least 25%, by cost, of the total value of permanently installed products in the project from manufacturers who engage in safety, health, hazard, and risk programs and require independent third party verification of their supply chain for minimization of health and safety hazards pertinent to chemical ingredients.

For credit achievement calculation of options 2 and 3, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Tile and related installation materials are typically made of safe natural ingredients, and some manufacturers offer chemical inventories of their products, and/or have released health product declarations (HPDs) and other USGBC approved material ingredient reports. Others might provide such reporting on request. Additionally, material ingredient record keeping is required of Green Squared Certified tiles and installation materials.

Inquire with manufacturers about whether they have voluntary ingredient reporting or optimization initiatives in place themselves or within their supply chain. Also ask about production and ingredient extraction locations as regionally manufactured products can double the contribution to the requirements of this Credit.

Using broken ceramic tile in decorative applications is a time-honored practice, as evidenced in this early 20th-century mosaic designed by Antoni Gaudí in Barcelona, Spain.



CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

STATED INTENT: *“To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.”*

PERTINENT REQUIREMENTS:

Recycle and/or salvage nonhazardous construction and demolition materials:

Option 1: Diversion

Divert a minimum of 50% or 75% of the total construction and demolition material using a minimum of three or four material streams.

OR

Option 2: Reduction of total waste material

Do not generate more than 2.5 pounds of construction waste per square foot of the building's floor area.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Tile products are solid, inert, and nonhazardous, and can be crushed and recycled into new materials or aggregates for the manufacture of new products, clean fill, or other beneficial reuse projects (e.g. roadways). Additionally, tile and related installation material packaging is widely recyclable. This comprehensive recyclability makes tile a good fit for a variety of material diversion streams.

A typical tile installation involves products of standard material lengths and quantities, largely eliminating off-cuts and scrap and reducing jobsite waste. Moreover, new reduced-thickness tile technologies are allowing tile to be installed over existing materials, eliminating the need for waste-producing demolition. Tile installations clearly contribute to the minimal waste per square foot requirements of Option 2.

Tile's zero VOC emissions make it a perfect part of any indoor air quality management plan.



INDOOR ENVIRONMENTAL QUALITY

LOW-EMITTING MATERIALS

STATED INTENT: *“To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.”*

PERTINENT REQUIREMENTS:

Option 1: Product Category Calculations

To demonstrate compliance, a product or layer must meet all of the following, as applicable.

Inherently non-emitting sources. Products that are inherently non-emitting sources of VOCs (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring) are considered fully compliant without any VOC emissions testing if they do not include integral organic-based surface coatings, binders, or sealants.

General emissions evaluation. Building products must be tested and determined compliant in accordance with CDPH Standard Method v1.1-2010, using the applicable exposure scenario.

Additional VOC content requirements for wet-applied products.

- All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, July 1, 2005.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Tile is VOC-free, due to its inherent inorganic properties, and is cited by this credit as an “inherently non-emitting source.” This means that ceramic tile may be used towards this credit without any requirements for testing.

Many tile adhesives, grouts and backer boards that contain zero or very low VOCs are available; these materials are well below the thresholds of compliance with emissions and content standards.

Green Squared Certified tiles and installation materials are verified as inorganic or within the content and emission limits specified by this Credit.

CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN

STATED INTENT: *“To promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation.”*

PERTINENT REQUIREMENTS:

Develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building.

During construction, meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008-2008, Chapter 3.

Protect absorptive materials stored on-site and installed from moisture damage.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

SMACNA guidelines focus predominantly on pollutant abatement through ventilation and air circulation management, also acknowledging that the extent to which such abatement is required can be minimized when a plan specifies the use of low-toxicity and low VOC construction materials. Furthermore, a good IAQ management plan establishes strategies to protect a project from the effects of mold and moisture.

Because tile and related installation materials are non-toxic, inherently VOC-free, and resistant to damage from moisture and mold, they facilitate contaminant source control measures on a project.

INDOOR AIR QUALITY ASSESSMENT

STATED INTENT: *“To establish better quality indoor air in the building after construction and during occupancy.”*

PERTINENT REQUIREMENTS:

To be implemented after construction ends and the building has been completely cleaned. All interior finishes must be installed, and major VOC punch list items must be finished.

Option 2. Air testing

After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline IAQ testing.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Tile products are helpful in achieving optimal air quality assessments as they are VOC-free, formaldehyde-free, and non-toxic.

Tile cuts are typically made on wet saws, minimizing dust that could linger post-construction and adversely affect indoor air quality assessment. Impervious packaging and dust-reducing technologies in cement mortars and grouts also reduce airborne dust particles.

THERMAL COMFORT

STATED INTENT: *“To promote occupants’ productivity, comfort, and well-being by providing quality thermal comfort.”*

PERTINENT REQUIREMENTS:

Option 1. ASHRAE Standard 55-2010

Design heating, ventilating, and air-conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55-2010, Thermal Comfort Conditions for Human Occupancy, with errata or a local equivalent.

OR

Option 2. ISO and CEN Standards

Design HVAC systems and building envelope to meet the requirements of the applicable standard:

ISO 7730:2005, Ergonomics of the Thermal Environment, analytical determination and interpretation of thermal comfort, using calculation of the PMV and PPD indices and local thermal comfort criteria; and

CEN Standard EN 15251:2007, Indoor Environmental Input Parameters for Design and Assessment of Energy Performance of Buildings, addressing indoor air quality, thermal environment, lighting, and acoustics, Section A2.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Based on thermal comfort goals, consider whether a project is a candidate for natural conditioning, or the use of zero-energy strategies, such as cross or stack natural ventilation paths, passive solar heating, and thermal mass to moderate exterior conditions.

The inherent thermal mass of a tile installation, both as an interior finish or as an exterior building envelope component, helps moderate indoor temperature swings, creating a more stable and comfortable indoor environment. ASHRAE, ISO, and CEN standards all include compliance paths for natural conditioning and the use of tile can strengthen a project’s candidacy for natural conditioning and help it meet pertinent requirements in the referenced standards.

For mechanically conditioned projects, or those with combined mechanical and natural conditioning, tile’s inherent thermal mass and capacity to moderate indoor temperature swings can help reduce the burden on HVAC systems, increase their efficiency, and introduce options for radiant and geothermal heating.

A tile installation’s inherent thermal mass makes it an ideal flooring choice to use in conjunction with radiant heating systems.





The high light reflectance value (LRV) of light-colored tiles helps maximize the efficiency of interior lighting.

INTERIOR LIGHTING

STATED INTENT: *“To promote occupants’ productivity, comfort, and well-being by providing high-quality lighting.”*

PERTINENT REQUIREMENTS:

Option 2. Lighting quality

Strategy E: For 90% of the regularly occupied floor area, meet the following thresholds for area-weighted average surface reflectance: 85% for ceilings, 60% for walls, and 25% for floors.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Walls, floors, or ceilings with high surface reflectance, or light reflectance value (LRV), can facilitate improved interior lighting conditions, increase the efficiency of natural lighting, and reduce the number of artificial lighting fixtures needed.

Light beige, light grey, and off-white tiles often have LRVs around 60%, and LRVs for white tiles commonly exceed 85%. Tile is one of the rare surface coverings that can be used to cover floors, walls, and ceilings, creating a monolithic envelope that maximizes interior light reflectance. Furthermore, tiled surfaces are easily kept clean and are inherently colorfast, so tile maintains its LRV throughout its life cycle.

When specifying tile, refer to the industry standard for determining LRV, ASTM C609. Some Green Squared Certified products satisfy surface reflectance design needs, as an LRV criterion is an elective of the Green Squared standard.

SUSTAINABLE SITES

OPEN SPACE

STATED INTENT: *“To create exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.”*

PERTINENT REQUIREMENTS:

Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). A minimum of 25% of that outdoor space must be vegetated.

The outdoor space must be physically accessible and be one or more of the following:

- A pedestrian-oriented paving or turf area with physical site elements that accommodate outdoor social activities
- A recreation-oriented paving or turf area with physical site elements that encourage physical activity

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Tile can be used as a highly decorative, sustainable, and durable paving material in all or some of the 75% of open space permitted to be hardscaped. It offers numerous design possibilities, and does not detract from its natural surroundings.

HEAT ISLAND REDUCTION

STATED INTENT: *“To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.”*

PERTINENT REQUIREMENTS:

Use any combination of the following strategies
Non-roof measures

- Use paving materials with a three-year aged solar reflectance (SR) value of at least 0.28. If three-year aged value information is not available, use materials with an initial SR of at least 0.33 at installation.

High-reflectance roof

- Use roofing materials that have a Solar Reflectance Index (SRI) equal to or greater than the values in Table 1

	Initial SRI	3-year aged SRI
Low-sloped roof	82	64
Steep-sloped roof	39	32

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Light-colored tiles can be used in myriad exterior installations: thick tile pavers, ventilated ceramic façades, and even as roofing components. Because tile is inherently colorfast, it maintains its SR and SRI value far longer than the three years required for this credit and is a great alternative to traditional paving and roofing materials. Data may be available for Green Squared Certified products, as solar reflectance is an elective criterion of the Green Squared standard.

Tile is durable enough for a variety of outdoor applications, and is available in colors and textures that blend seamlessly into natural environments.



INTEGRATIVE PROCESS

INTEGRATIVE PROCESS

STATED INTENT: *“To support high-performance, cost-effective project outcomes through an early analysis of the interrelationships among systems.”*

PERTINENT REQUIREMENTS:

Beginning in pre-design and continuing throughout the design phases, identify and use opportunities to achieve synergies across disciplines and building systems.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

All components of an installation — tile, related installation materials, and tiling substrates — can positively impact the influence of interior finishes and building envelope components on other building systems and should be evaluated as part of a project’s integrative analysis.

Ventilated ceramic tile façades are highly colorfast, offer numerous design options, and can help increase a structure’s overall energy efficiency.



ENERGY AND ATMOSPHERE

OPTIMIZE ENERGY PERFORMANCE

STATED INTENT: *“To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use.”*

PERTINENT REQUIREMENTS:

Establish an energy performance target

Option 1. Whole-building energy simulation

- Analyze efficiency measures during the design process and account for the results in design decision making.
- Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline.

Option 2. Prescriptive compliance: ASHRAE Advanced Energy Design Guide

- Building envelope, opaque

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

The inherent thermal mass of a tile installation helps reduce peak heating and cooling loads and shift peak loads to non-peak hours, moderating indoor temperature swings and reducing the size of HVAC systems needed.

Radiant floor heating systems work particularly well with tile, and they can be far more energy-efficient than forced air heating systems.

Tile is an excellent option for a ventilated façade which creates a “chimney effect” on the building exterior, evacuating hot air in the summer and improving insulation properties in the winter, potentially resulting in substantial energy savings.

INNOVATION

INNOVATION

STATED INTENT: *“To encourage projects to achieve exceptional or innovative performance.”*

PERTINENT REQUIREMENTS:

Option 1. Innovation

Achieve significant, measurable environmental performance using a strategy not addressed in the LEED green building rating system.

Option 2. Pilot

Achieve one pilot credit from USGBC’s LEED Pilot Credit Library

Option 3. Exemplary performance

Achieve exemplary performance in an existing LEED v4 prerequisite or credit that allows exemplary performance, as specified in the LEED Reference Guide, v4 edition. An exemplary performance point is typically earned for achieving double the credit requirements or the next incremental percentage threshold.

TIPS FOR INTEGRATING TILE INTO YOUR DESIGN:

Several tile products in the marketplace incorporate new, advanced technologies including photovoltaic cells fused to tiles, antimicrobial additives in grout, photocatalytic tile surfaces, underlayments with geothermal channels, and many more. These innovative products offer the potential to generate and conserve energy, clean the surrounding air, and facilitate more sustainable interior and exterior environments. Consult manufacturers to learn about the many exciting technologies available or in research and development.

Refer to the LEED Pilot Credit Library frequently at www.usgbc.org to discover potential new credits that may be relevant to tile.

Many tiles and installation materials offer the potential to contribute to doubling credits toward requirements and/or achieving the next incremental threshold.

Consider using Green Squared Certified products which have innovative properties, are sustainable beyond baseline certification requirements, or could potentially be piloted for additional contribution to LEED v4.



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- MULTI-ATTRIBUTE SUSTAINABILITY



THE TOTAL PACKAGE FOR SUSTAINABLE TILE INSTALLATIONS

-  PRODUCT CHARACTERISTICS
-  MANUFACTURING OPERATIONS
-  END OF PRODUCT LIFE MANAGEMENT
-  PROGRESSIVE CORPORATE GOVERNANCE
-  INNOVATION



www.greensquaredcertified.com

Green Squared® is North America's sustainability standard and certification program for tile and tile installation products. Green Squared Certified® products and their manufacturers must conform to a vast array of life cycle-based, multi-attribute criteria, from product contents to corporate social and environmental policies. For a product to earn the right to use the Green Squared Certified logo, it must be verified as sustainable by one of the three leading third-party certification bodies approved by the Green Squared program. So when you see the Green Squared Certified logo, you can rest assured that the product that bears it has met sustainability benchmarks rigorous enough to meet the demands of the greenest of green building projects.

Specify Green Squared Certified tile and tile installation products: One simple step and you're finished. Because sustainability doesn't have to be complicated!

WHY CHOOSE GREEN SQUARED CERTIFIED PRODUCTS?

■ Perfect for Green Building

EARN POINTS:

- Green Globes for New Construction 2014 (v13)
- NAHB National Green Building Standard (ICC 700-2012)

FULFILL A BROAD RANGE OF CRITERIA:

- Leadership in Energy & Environmental Design (LEED v4)
- International Green Construction Code (IgCC-2012)

RECEIVE MULTI-ATTRIBUTE CERTIFICATION CREDIT:

- Standard for the Design of High-Performance Green Buildings (ASHRAE 189.1-2014)

■ Third-Party Certified

- Independent Evaluation by Leading Certification Bodies
- Verified Conformance to the Green Squared Standard



THE TOTAL PACKAGE

PRODUCT CHARACTERISTICS



- Recycled or Reclaimed Content
- Sustainable Packaging
- Little-to-Zero VOC Emissions
- Solar Reflectance Index (SRI)
- Light Reflectance Value (LRV)
- Life Cycle Assessment (LCA)
- Environmental Product Declaration (EPD)

MANUFACTURING OPERATIONS



- Indigenous Raw Materials
- Pollution Prevention
- Responsible Combustion
- Environmental Management Plan
- Conservation and Reduction in Energy Use
- Waste Minimization Plan

END OF PRODUCT LIFE MANAGEMENT



- Clean Fill Eligibility
- End of Product Life Collection Plan

PROGRESSIVE CORPORATE GOVERNANCE



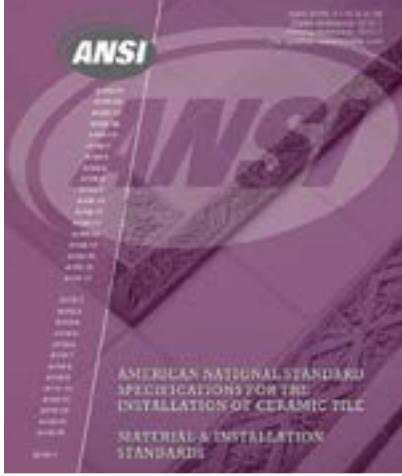
- Social Responsibility Strategy
- Ongoing Community Involvement
- Annual Sustainability Reporting

INNOVATION



- Innovative Attribute, Process or Corporate Governance Strategy
- Greenhouse Gas Awareness

for sustainable tile installations



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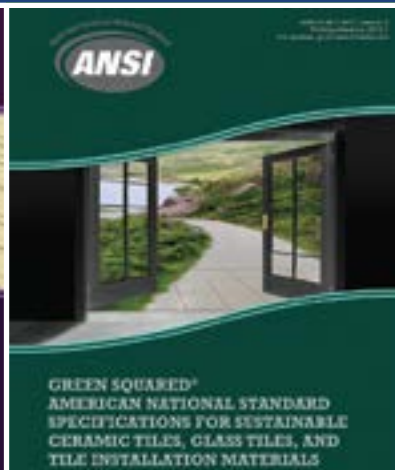
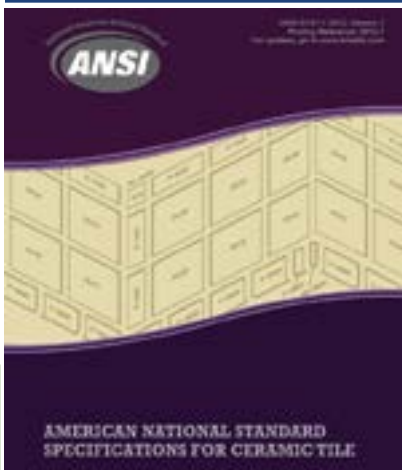
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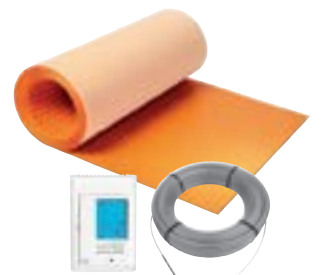
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GREEN SQUARED CERTIFIED PRODUCT INSTALLATIONS

The inherent eco-friendliness of tile and tile installation products is exemplified by Green Squared Certified® products.

Green Squared® is a multi-attribute, industry-wide standard that underscores the North American tile industry's commitment to sustainable manufacturing. The Green Squared standard provides architects, specifiers, and consumers with a consistent set of criteria for evaluating the sustainability of tile and tile installation products.



Products bearing the Green Squared Certified logo are manufactured according to rigorous sustainability criteria that address a broad range of considerations, from extraction of the raw materials needed to reuse or disposal at the end of a product's life. Manufacturers of Green Squared Certified products invest considerable resources to ensure their facilities and manufacturing practices are

socially and environmentally responsible, and to obtain third-party certification.

Clearly, Green Squared Certified products are robustly sustainable. They are also beautiful, as the photos on the following pages illustrate.

The tile and installation products pictured here represent only a handful of the Green Squared Certified products that are currently available. Hundreds of products have been certified, and still more are in the certification process.

PROJECT SITE: Tender Greens Restaurant
San Diego, CA
Downtown Location: Opened 2013

PROJECT SCOPE: 300 square feet

GREEN SQUARED CERTIFIED PRODUCTS:

- Eco-Tile Natural Hues 2x8
(Ceramic Tile with color match custom glazes)



“ We incorporate eco-friendly design consisting mostly of reclaimed, recycled and environmentally friendly materials. . . . New restaurants make use of timber from the old spaces which are transformed into tables and countertops to reduce waste. ”

— Tender Greens website
www.tendergreens.com



PROJECT SITE:

Colorado College Athletic Facility
Colorado Springs, CO

PROJECT SCOPE: 120,000 square feet

GREEN SQUARED CERTIFIED PRODUCTS:

- Progetta Casa and Urbanite (Through Body Porcelain)
- PietraArt Stone Slate



“While this building was not LEED [certified], we wanted to be aware of our environmental impact. These products were chosen because of recycled content as well as performance. Sustainable products have come a long way; these products are performing great in a high traffic space.”

— Cally Dalton, Interior Designer
Oz Architecture Denver, CO





PROJECT SITE: San Francisco Toyota
San Francisco, CA

PROJECT SCOPE: Approximately 8,000 square feet total
Showroom is 5,800 square feet

GREEN SQUARED CERTIFIED PRODUCTS:

- Color Blox EC Slinky 24 x 24 (showroom, hallway, and coffee bar)
- EcoCycle-Night Air 12 x 12 (Scion area and new car delivery area)
- EcoCycle-Pine Barren 12 x 12 (Path on floor in the Eco/Prius area)



100 percent of the original structure, a 19th-century horse barn, was recycled for this LEED NC Platinum Certified San Francisco Toyota facility. 75 percent of the construction waste was recycled, according to the tile manufacturer.



PROJECT SITE: T. Boone Pickens Institute of Health Sciences,
Texas Woman's University
Dallas, TX | Opened 2011

PROJECT SCOPE: 6,000 square feet

GREEN SQUARED CERTIFIED PRODUCTS:

- Ultralite Mortar (used to set 6 x 24 inch blue-and-white wall tiles in bathrooms, labs, and break rooms)



This project was built for LEED Gold certification, and Ultralite Mortar was selected, in part, for its > 20% recycled material and BioBlock technology for mold and mildew resistance, which helped contribute toward this goal, according to the mortar manufacturer.

PROJECT SITE:

Arizona Phoenix Children's Hospital

PROJECT SCOPE:

450,000 square feet

GREEN SQUARED CERTIFIED PRODUCTS:

- Semi-Gloss™



The design team from HKS Architects implemented sustainable strategies to lower the carbon footprint of the project, including materials selection. Semi-Gloss is made of 35% pre-consumer recycled material and is produced at a U.S. manufacturing facility, according to the tile manufacturer.





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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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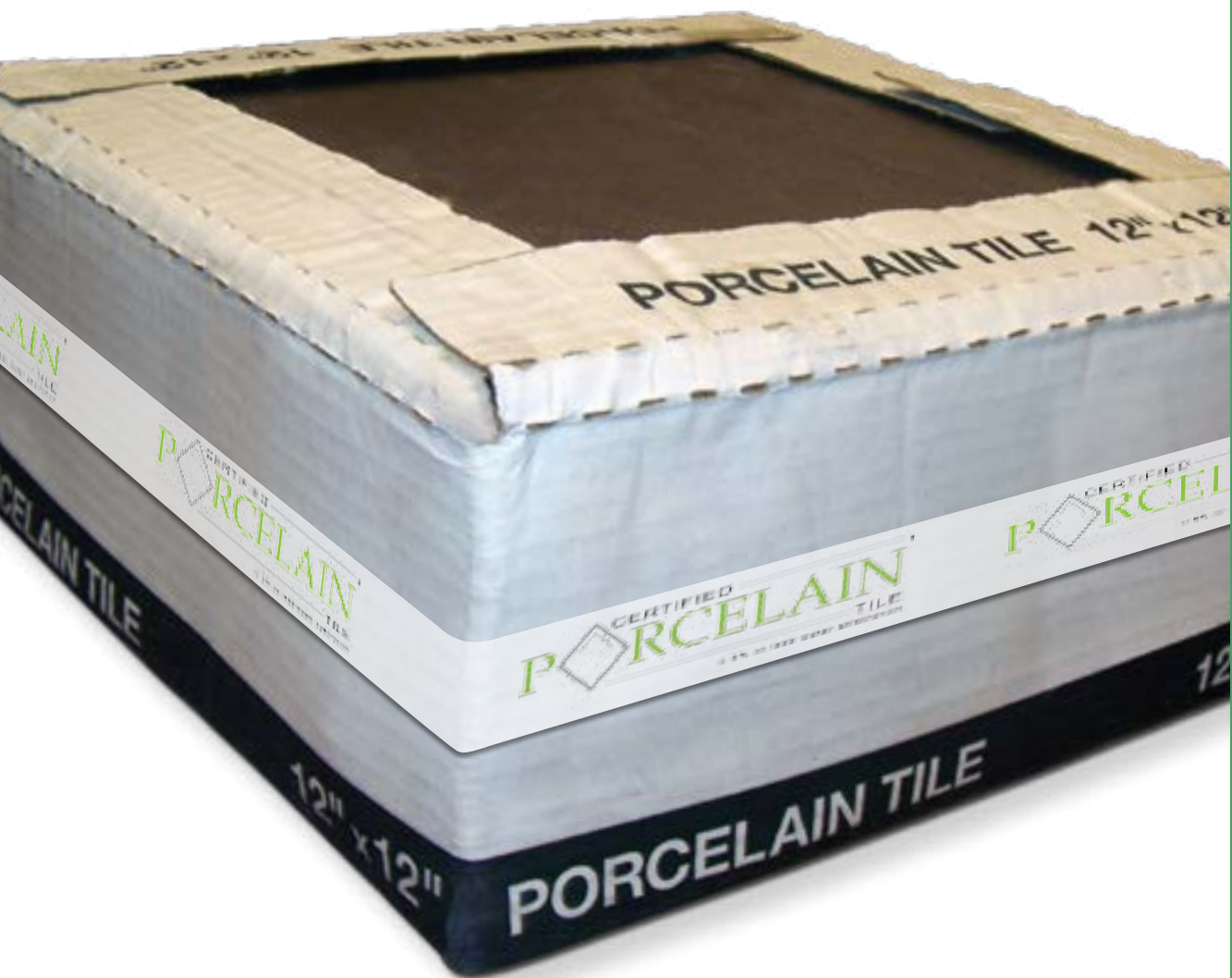


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