
SECTION 09 30 13.13

PORCELAIN TILING

Corian® Endura™ high-performance porcelain manufactured by DuPont, (DuPont Specialty Products USA, LLC), Experimental Station 356, 200 Powder Mill Road, Wilmington, DE 19803, Toll-Free: (800) 426-7426, Web site: www.endura.corian.com; www-surfaces.dupont.com

Note: The purpose of this product guide specification is to assist the Specifier in specifying Corian® Endura™. Refer to Corian® Design (800-426-7426) and/or Corian® Endura™ Technical Bulletins for additional information. Use this guide specification for interfacing with architectural millwork and/or trim components.

Design Professionals or Architects need to review Sections and edit to fit the needs of the project and local building code(s). Throughout the guide specification, there are Specifier Notes in blue to assist in the editing of the file. Optional user input areas are enclosed within brackets, [_____]; delete optional text in the final copy of specification.

This product guide specification is written in CSC format.

1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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- 1.2.1 This Section includes, but is not limited to, the following VERTICAL HIGH-PERFORMANCE PORCELAIN (ALSO KNOWN AS ULTRACOMPACT, SINTERED) surfacing:

- 1.2.1.1 Walls.
- 1.2.1.2 Feature walls.
- 1.2.1.3 Fireplace surrounds.
- 1.2.1.4 Wet walls.
- 1.2.1.5 Wainscotting.
- 1.2.1.6 Backsplash.
- 1.2.1.7 [_____].

1.3 RELATED REQUIREMENTS

- 1.3.1 Section 01 35 21 – LEED requirements.
- 1.3.2 Section 06 10 53 – Miscellaneous rough carpentry.
- 1.3.3 Section 07 92 00 – Joint sealants.
- 1.3.4 Section 09 30 13 – Ceramic tiling.
- 1.3.5 Section 22 05 00 – Common work results for plumbing.
- 1.3.6 Section 26 50 00 – Lighting.
- 1.3.7 Section [_____].

1.4 REFERENCES

- 1.4.1 ISO 10545 Ceramic tiles – Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density.
- 1.4.2 ISO 10545 Ceramic tiles – Part 13: Determination of chemical resistance.
- 1.4.3 ISO 10545 Ceramic tiles – Part 12: Determination of frost resistance.
- 1.4.4 EN 15186 Furniture – Assessment of the surface resistance to scratching.
- 1.4.5 ISO 10545 Ceramic tiles – Part 10: Determination of moisture expansion.
- 1.4.6 ISO 10545 Ceramic tiles – Part 4: Determination of modulus of rupture and breaking strength.
- 1.4.7 ASTM C170M-16 – Standard Test Method for Compressive Strength of Dimension Stone.
- 1.4.8 EN 14617-9 – Agglomerated stone – Test Methods – Part 9: Determination of impact resistance.
- 1.4.9 ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C.
- 1.4.10 ULC (Underwriters Laboratories of Canada) – ULC/CAN-S102 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- 1.4.11 ASTM C372 – Standard Test Method for Linear Thermal Expansion of Porcelain Enamel and Glaze Frits and Fired Ceramic Whiteware Products by the Dilatometer Method.
- 1.4.12 ASTM C424 – Standard Test Method for Crazing Resistance of Fired Glazed Whitewares by Autoclave Treatment.

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- 1.4.13 ASTM C650 – Standard Test Method for Determination of Resistance to Chemical Substances.
 - 1.4.14 ASTM C482 – Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.
 - 1.4.15 ASTM C1027 – Standard Test Method for Determining Visible Abrasion Resistance of Glazed Ceramic Tile.
 - 1.4.16 ASTM C1243 – Standard Test Method for Relative Resistance to Deep Abrasive Wear of Unglazed Ceramic Tile by Rotating Disc.
 - 1.4.17 ASTM C1378 – Standard Test Method for Resistance to Staining.
 - 1.4.18 ANSI 118.15 – Improved Method Dry-Set Cement Mortar.
 - 1.4.19 ISO 13007 – Ceramic Tiles - Grouts and Adhesives.
 - 1.4.20 UL Environment/GREENGUARD - UL 2818 – Certification Standard for Chemical Emissions for Building Materials, Finishes and Furnishings, Section 7.1.
 - 1.4.21 UL Environment/GREENGUARD - UL 2818 – Gold Certification Standard for Chemical Emissions for Building Materials, Finishes and Furnishings, Section 7.1 and 7.2.
 - 1.4.22 UL 2824 – GREENGUARD Certification Program Method for Measuring Microbial Resistance from Various Sources Using Static Environmental Chambers.
 - 1.4.23 SCAQMD (South Coast Air Quality Management District) VOC (Volatile Organic Content) Rule 1168 for Adhesive and Sealant Applications.
 - 1.4.24 Star-K Kosher Certification (www.star-k.org).

1.5 SUBMITTALS

- 1.5.1 Submit product data for each type of product indicated.
 - 1.5.1.1 Submit manufacturer's product data on material characteristics, performance properties, fabrication instructions, installation instructions and maintenance instructions.
- 1.5.2 Shop drawings:
 - 1.5.2.1 Show location of each item; provide complete detailed and dimensioned plans and elevations, large-scale details, attachment devices and other components.
 - 1.5.2.2 Show the following:
 - 1.5.2.2.1 Full-size details, edge details, attachments, etc.
 - 1.5.2.2.2 Locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
 - 1.5.2.2.3 Fabrication details for brackets.
 - 1.5.2.2.4 Locations and sizes of cutouts and holes for plumbing fixtures, faucets, electrical outlets, waste receptacle and other items installed in porcelain ultra-compact surface.
 - 1.5.2.2.5 Type of sealant.
 - 1.5.2.2.6 Type of adhesive.
 - 1.5.2.2.7 Type of grout.
 - 1.5.2.2.8 Seam locations.
- 1.5.3 Samples:

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- 1.5.3.1 For each type of product indicated:
 - 1.5.3.1.1 Submit minimum 40-mm-by-40-mm (2.4-inch-by-2.4-inch) sample in specified color and finish. For viewing pattern or veining, submit minimum 225-mm-by-110-mm (8.9-inch-by-4.3-inch) sample.
 - 1.5.3.1.2 Cut sample and seam together for representation of seaming techniques.
 - 1.5.3.1.3 Indicate full range of color and pattern variation.
 - 1.5.3.1.4 Approved samples will be retained as a standard for work.
 - 1.5.4 Product data:
 - 1.5.4.1 Indicate product description, fabrication information and compliance with specified performance requirements.
 - 1.5.5 Sustainable Design reporting:
 - 1.5.5.1 Provide documentation from manufacturer indicating that adhesives applied on project site meet or exceed emissions guidelines for volatile organic compounds (VOCs) of SCAQMD Rule #1168 and Bay Area Quality Management District (BAAQMD).
 - 1.5.6 LEED Submittals:
 - 1.5.6.1 LEED® 2009, Credits MR Credit 4.1– Low-Emitting Materials – Adhesives and Sealants.
 - 1.5.6.1.1 Provide documentation from manufacturers indicating that adhesives and sealants applied on project site meet or exceed emissions guidelines for volatile organic compounds (VOCs) and comply with SCAQMD Rule #1168 and Bay Area Quality Management District (BAAQMD).
 - 1.5.6.2 LEED® NC v4, EQ: Indoor Environmental Quality, EQ Credit: Low-Emitting Materials.
 - 1.5.6.2.1 Provide documentation from manufacturers that products meet or exceed emissions guidelines for volatile organic compounds (VOCs).
 - 1.5.6.2.2 Provide documentation from manufacturers that adhesives and sealants meet or exceed emissions guidelines for volatile organic compounds (VOCs) and comply with SCAQMD Rule #1168 and Bay Area Quality Management District (BAAQMD).
 - 1.5.6.3 LEED® NC v4, MR Credit: Building Product Disclosure and Optimization - Material Ingredients.
 - 1.5.6.3.1 Option 1. Material Ingredient Reporting.
 - 1.5.6.3.2 Provide manufacturer's HPD (Health Product Declaration).
 - 1.5.7 Fabricator/installer qualifications:
 - 1.5.7.1 Provide copy of certification/approval information/qualifications.
 - 1.5.8 Certificates: Certify that products meet or exceed requirements.
 - 1.5.8.1 UL Environment – GREENGUARD and GREENGUARD Gold, current low emitting VOC certification of porcelain surface, quartz surface and solid surface products in accordance with UL 2818.

- 1.5.8.2 UL Environment – GREENGUARD and GREENGUARD Gold, current low emitting VOC certification for manufacturer's recommended grout, adhesive and/or sealant in accordance with UL 2824.
- 1.5.8.3 UL Environment – Mold Resistance Certification in accordance with UL 2824.
- 1.5.9 Fire test response characteristics:
 - 1.5.9.1 Provide non-combustible characteristics as determined by testing product per ASTM E136.
 - 1.5.9.2 Provide fire performance characteristics as determined by testing product per ULC/CAN-S102.
- 1.5.10 Maintenance data:
 - 1.5.10.1 Submit manufacturer's care and maintenance data.
 - 1.5.10.2 Include in project closeout documents.

1.6 QUALITY ASSURANCE

- 1.6.1 Fabricator and installation qualifications:
 - 1.6.1.1 Work shall be done by Certified fabricators who have been trained and certified by manufacturer's designated Distributors on how to fabricate, transport, handle and install product.
 - 1.6.1.2 Standalone commercial installation shall be done by approved commercial installers. Installers are approved by manufacturer's designated Distributors.
- 1.6.2 Allowable tolerances:
 - 1.6.2.1 Variation in component size: 3 mm ($\pm 1/8$ inch) in 10-foot length direction.
 - 1.6.2.2 Location of openings: 3 mm ($\pm 1/8$ inch) from indicated location.
- 1.6.3 Coordination drawings:
 - 1.6.3.1 Shall be prepared indicating:
 - 1.6.3.1.1 Electrical work.
 - 1.6.3.1.2 Plumbing work.
 - 1.6.3.1.3 Miscellaneous steel for the general work.
 - 1.6.3.1.4 Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.
 - 1.6.3.2 Content:
 - 1.6.3.2.1 Project-specific information, drawn accurately to scale.
 - 1.6.3.2.2 Do not base coordination drawings on reproductions of the contract documents or standard printed data.
 - 1.6.3.2.3 Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
 - 1.6.3.2.4 Provide alternate sketches to designer for resolution of such conflicts.
 - 1.6.3.2.5 Minor dimension changes and difficult installations will not be considered changes to the contract.
 - 1.6.3.3 Drawings shall:
 - 1.6.3.3.1 Be produced in 1/2-inch scale for all fabricated items.

1.6.3.4 Drawings must be complete and submitted to the architect within 60 days after award of contract for record only.

1.6.3.4.1 No review or approval will be forthcoming.

1.6.3.4.2 Coordination drawings are required for the benefit of contractor's fabricators/installers as an aid to coordination of their work to eliminate or reduce conflicts that may arise during the installation of their work.

1.6.4 Job mock-up:

1.6.4.1 Prior to final approval of shop drawings, erect full size sample mock-up unit to further verify selections made under sample submittals and to demonstrate the quality of materials and execution.

1.6.4.2 Mock-up shall be [] dimensions. Include [trim] and [].

1.6.4.3 Build the mock-up to comply with the contract documents and install in a location as directed by the architect. Locate [].

1.6.4.4 Notify the architect two weeks in advance of the date of when the mock-up will be delivered.

1.6.4.5 Should mock-up not be approved, re-fabricate and reinstall until approval is secured.

1.6.4.6 Remove rejected units from project site.

1.6.4.7 Mock-up, once approved, may become a part of the project and serve as a standard for judging quality of all completed units of work.

1.6.5 Pre-installation conference:

1.6.5.1 Conduct conference at project site to comply with requirements in Division 1.

1.7 DELIVERY, STORAGE AND HANDLING

1.7.1 Deliver no components to project site until areas are ready for installation.

1.7.2 Store components indoors in clean and dry area prior to installation.

1.7.3 Protect and handle materials to prevent damage to edges and finished surfaces.

1.7.4 Follow manufacturer's "safety anchors", "anchoring systems" or "safety withholding hooks" recommendations for safe handling and storage recommendations.

1.7.5 Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.8 WARRANTY

1.8.1 Provide manufacturer's 10-year product only warranty.

1.9 MAINTENANCE

1.9.1 Provide care and maintenance requirements as specified by the manufacturer.

2 PRODUCTS

2.1 MANUFACTURERS

- 2.1.1 Contract Documents are based on high performance porcelain also known as ultra-compact, sintered [slab, panel or sheet] products manufactured by DuPont (DuPont Specialty Products USA, LLC). Provide Corian® Endura™ (basis of design) subject to compliance with the requirements.
- 2.1.1.1 Corian® Design, Corian® Endura™.
 - 2.1.1.2 Address: 974 Centre Road, Wilmington, DE 19805.
 - 2.1.1.3 Phone: (800) 426-7426.
 - 2.1.1.4 Website: www-surfaces.dupont.com; www.endura.corian.com
 - 2.1.1.5 Subject to compliance with the requirements, provide the following product: high-performance porcelain surface from Corian® Design (basis of design).

- 2.1.2 Substitutions: Not permitted.

2.2 MATERIALS

2.2.1 Material:

- 2.2.1.1 Corian® Endura™ high-performance porcelain, also known as ultra-compact, sintered surfacing material. Corian® Endura™ high-performance porcelain is comprised of natural minerals and pigments sintered under high pressure into slabs, sheets or panels.
- 2.2.1.2 Material shall have minimum physical and performance properties as specified.
- 2.2.1.3 Color Portfolio [____], Color [____], Finish [____].
- 2.2.1.4 Thickness: [12 mm (1/2 inch)] [6 mm (1/4 inch)].
- 2.2.1.5 Edge treatment: [_____] or Not Finished.
- 2.2.1.6 Seam width:
 - 2.2.1.6.1 Minimum 2 mm (3/32 inch) gap between slabs for interior vertical application filled with grout.
 - 2.2.1.6.2 2 mm (3/32 inch) bevel provides a durable edge for handling.

2.2.2 Corian® Endura™ Performance Properties (TYPICAL RESULTS):

- 2.2.2.1 ISO 10545-3, % Water Absorption: 0.08% (Average).
- 2.2.2.2 ISO 10545-13, Resistance to Low Concentrations of Acids and Bases: ULA-ULB (Satin/Mineral).
- 2.2.2.3 ISO 15045-12, Frost Resistance: Resistant.
- 2.2.2.4 ISO 15186 method B, Scratch Resistance: Class A.
- 2.2.2.5 ISO 15045-10, Moisture Expansion: 0.01% (0.1 mm).
- 2.2.2.6 ISO 10545-4, Breaking Strength: 5,500 N Average (12 mm);
Breaking Strength: 14,400 N Average (20 mm); Flexural Strength 53 N/mm² Average (12 mm); Flexural Strength 52 N/mm² Average (20 mm).
- 2.2.2.7 ASTM C170M-16, Compression Strength: 527.9 Mpa.
- 2.2.2.8 EN 14617-9, Impact Resistance: 3.03 J (12 mm).
- 2.2.2.9 ASTM E136, Non-combustible: PASS.

- 2.2.2.10 CAN/ULC-S102, Flame Spread Value: 0 (12 mm), Smoke Developed Value: 0 (12 mm).
- 2.2.2.11 ASTM C372, Linear Thermal Expansion: $6.23 \times 10^{-6}/^{\circ}\text{C}$ (Avg. over -20° to 80°C); $3.46 \times 10^{-6}/^{\circ}\text{F}$ (Avg. over -4° to 176°F).
- 2.2.2.12 ASTM C424, Crazing Resistance: No Crazing Observed.
- 2.2.2.13 ASTM C650-2, Chemical Substances Resistance: No Effect.
- 2.2.2.14 ASTM C1895, Mohs Scratch Hardness: 7.
- 2.2.2.15 ASTM C370-12, Moisture Expansion: 0.007% Average.
- 2.2.2.16 ASTM C482-02, Bond Strength of Ceramic Tile to Portland Cement: 200 PSI.
- 2.2.2.17 ASTM C1027-19, Visual Abrasion Resistance: 150 Rev. Visible difference.
- 2.2.2.18 ASTM C1243-93, Deep Abrasive wear by Rotating Disc: Avg. Volume 53.4 mm^3 .
- 2.2.2.29 ASTM C1378-20, Resistance to Staining: No Visual Effect.
- 2.2.2.20 Nominal Thickness: 12 mm and 20 mm.
- 2.2.2.21 Nominal Weight per square foot for 6 mm thickness is 3 pounds.
- 2.2.2.22 Nominal Weight per square foot for 12 mm thickness is 6 pounds.

2.2.3 CORIAN® ENDURA™ CERTIFICATIONS and APPROVALS:

- 2.2.3.1 UL 2818 UL Environment/GREENGUARD: Certified.
- 2.2.3.2 UL 2818 UL Environment/GREENGUARD: Gold Certified.
- 2.2.3.3 UL 2824: Mold Resistant.
- 2.2.3.4 Kosher: Listed by Star-K.

2.3 ACCESSORY PRODUCTS

- 2.3.1 Mechanical Hanging Systems. Refer to hanging system vendor for guidance.
- 2.3.2 Adhesives based installation are based on tile installation techniques.
- 2.3.3 Grout suitable for porcelain for gap between slabs installed vertically.

2.4 FABRICATION

- 2.4.1 Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
- 2.4.2 Form joints between components using manufacturer's standard joint adhesive.
 - 2.4.2.1 Reinforce as required.
 - 2.4.2.2 Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
 - 2.4.2.3 Rout and finish component edges with clean, sharp returns.
 - 2.4.2.4 Rout cutouts, radii and contours to template.
- 2.4.3 Smooth edges.

2.5 FINISHES

- 2.5.1 Select from the manufacturer's standard color chart.
 - 2.5.1.6 Portfolio: [____], Color: [____], Finish:[____].

3 EXECUTION

3.1 INSTALLATION

- 3.1.1 Install materials in accordance with manufacturer's instructions.
- 3.1.2 Plan work to avoid damaging material during transportation and installation.
- 3.1.3 Install components plumb and level, in accordance with approved shop drawings and product installation details.
 - 3.1.3.1 Panels - Flat and true to within 3 mm (1/8 inch) of a flat surface over a 10-foot length.
 - 3.1.3.2 Allow a minimum of 2 mm (3/32 inch) gap clearance between panels.
- 3.1.4 Keep components and hands clean when making joints.
- 3.1.5 Provide backsplashes and endsplashes as indicated on the drawings.
 - 3.1.5.1 Adhere to countertops using silicone adhesive.
 - 3.1.5.2 Keep components and hands clean when working with silicone adhesive.

3.2 CONNECTIONS:

- 3.2.1 Make plumbing connections in accordance with Division 22.
- 3.2.2 Make electrical connections in accordance with Division 26.

3.3 CLEANING AND PROTECTION

- 3.3.1 Keep components and hands clean during installation.
- 3.3.2 Remove adhesives, sealants and other stains in accordance with manufacturer's instructions.
 - 3.3.2.1 Clean exposed surfaces in accordance with manufacturer's instructions.
 - 3.3.2.2 Components shall be clean on date of substantial completion.
 - 3.3.2.3 Protect surfaces from damage until date of substantial completion.
 - 3.3.2.4 Replace or repair damaged work in a satisfactory manner.

3.4 SCHEDULE

- 3.4.1 [Wall Panel]:
 - 3.4.1.1 Location: [_____].
 - 3.4.1.2 Porcelain ultra-compact surface is adhesively joined with exposed seams.
 - 3.4.1.3 Portfolio: [____], Color: [____], Finish:[_____].
 - 3.4.1.3.1 Vertical Thickness [____] mm.
 - 3.4.1.3.2 Edge Details [_____].
- 3.4.2 [_____]:
 - 3.4.2.1 Location: [_____].
 - 3.4.2.2 Gap between ultra-compact porcelain ultra-compact slab/panel/sheet for vertical application is filled with grout suitable for porcelain.
 - 3.4.2.3 Portfolio: [____], Color: [____], Finish:[_____].

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- 3.4.2.3.1 Vertical Thickness [] mm.
 - 3.4.2.3.2 Edge Details [].
 - 3.4.2.6 []:
 - 3.4.2.7 Location: [].
 - 3.4.2.8 Porcelain ultra-compact surface is adhesively joined with exposed seams.
 - 3.4.2.9 Portfolio: [], Color: [], Finish:[].
 - 3.4.2.9.1 Vertical Thickness [] mm.
 - 3.4.2.9.2 Edge Details [].

END OF SECTION