

Cement Tile is an artisanal material that must be installed and cared for differently than ceramic or porcelain tile. This guide book includes Bellavita Tile's best recommendations and should be read and applied in full for best results. The items below are the most critical details and MUST be followed.

Inspect your product carefully prior to installation. Bellavita Tile will not take responsibility for any product claims once tile has been cut or installed. Review product and cartons for moisture damage prior to acceptance of your order.

Cement tile is sensitive to moisture and should be stored in a dry place. If exposed to moisture prior to installation tiles can be stained, faded or exhibit efflorescence

Due to the variation of tone inherent to the material, product should be mixed from multiple cartons during installation.

Backbuttering tile is critical for proper mortar coverage as well as adjustment during installation as thickness of product can vary +/- 1.5mm. Lippage will occur if care is not taken during installation.

Ensure a full cure of mortar is achieved and allow all moisture to dry from the tile and mortar bed prior to grouting.

Cement tile is porous! A grout-release is recommended prior to grouting and a high-quality penetrating sealer or wax is recommended once the installation has been allowed to achieve a full cure. Use UV resistant sealers in exterior installations. Oil-based sealers are recommended.

Efflorescence is a common occurrence with this material even if all care is taken during installation. DO NOT USE ACIDIC CLEANERS. Pressure washing or abrasion with a scrub pad or glass paper will often solve the problem. Initial application of penetrating sealer after final cure and re-application as suggested by manufacturer can reduce subsequent occurrences of efflorescence.

CRITICAL NOTES:

You have selected a handmade artisanal product made in the same way since the start of the 20th century. The natural variation and imperfections are part of the soul of the material and should be expected and celebrated.

Inspect your product carefully prior to installation. Bellavita Tile will not take responsibility for any product claims once tile has been cut or installed. Review product and cartons for moisture damage prior to acceptance of your order.

Cement tile is sensitive to moisture and should be stored in a dry place. If exposed to moisture prior to installation tiles can be stained, faded or exhibit efflorescence

Due to the variation of tone inherent to the material, product should be mixed from multiple cartons during installation.

Backbuttering tile and substrate is critical for adjustment during installation as thickness of product can vary +/- 1.5mm. Lippage will occur if care is not taken during installation.

To minimize efflorescence and other issues ensure a full cure of mortar is achieved and allow all moisture to dry from the tile and mortar bed.

Cement tile is porous! A grout-release is recommended prior to grouting and a high-quality penetrating sealer or wax is recommended once the installation has been allowed to achieve a full cure.

Efflorescence is a common occurrence with this material even if all care is taken during installation. DO NOT USE ACIDIC CLEANERS. Pressure washing or abrasion with a scrub pad or glass paper will often solve the problem. Initial application of penetrating sealer after final cure and re-application as suggested by manufacturer can reduce the reoccurrence of efflorescence.

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The enclosed instructions are intended as guidelines only. Bellavita Tile will not be held responsible for errors, issues or problems due to installation.

Critical Notes are here on the first page for a reason. Make sure to read, understand and follow ALL points to the left

Below are the standards applicable to the various materials that make up our cement tile. All materials comply with the associated standards below.

CEMENT

ASTM C-150	Specification for Portland Cement
ASTM C-595	Specification for Blended Cement

AGGREGATES

ASTM C-33	Specification for Concrete Aggregates
ASTM C-330	Specification for Lightweight Aggregates in Structural concrete

ADMIXTURES

ASTM C-494	Specification for Chemical Admixtures for Concrete
ASTM C-1017	Specifications for Chemical Admixtures for use in Producing Flowing Concrete
ASTM C-618	Specifications for Coal Fly Ash & Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete
ASTM C-979	Specifications for Pigments for Integrally Colored Concrete
ASTM C-1116	Specifications for Fiber-Reinforced Concrete & Shotcrete
ASTM C-1240	Specifications for Silica Fume for use as a Mineral Admixture in Hydraulic-Cement Concrete Mortar & Grout

SEALERS (FACTORY APPLIED)

ASTM C-1315	Specifications for Liquid Membrane-Forming Compounds having Special Properties for Curing & Sealing Concrete
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Section 1.ii : Product Strata

Cement tile is comprised of three stratified layers fused together by hydraulic pressure and standard chemical reactions within portland cement tile. Top layer is the finest flowing cement with mineral pigments and the subsequent two layer comprise the structural element of the tile.



Encaustic cement tile production is an artisanal art form that dates back to the latter stages of the 19th century. The entire process from the creation of the cast-iron forms to the mixing and pouring of the cements is done by the hands of skilled craftspeople.

Equal care goes into the selection of materials used for this product with most pigments and admixtures coming from Europe to ensure the finest detailing and highest performance product possible. The production facility itself is ISO 9001 certified and all product undergoes 4 stages of internal QC before being checked by external auditors.

Section 1.iv : Production Flowchart

MIXING

Pigmented Cement Mixing

natural minerals, cements & admixtures

Structural Cement Mixing

cements, silicates & admixtures

FORMING

Tile Making

Manual pouring of decorative layer and packing of structural layers of cement

Tile Pressing

Hydraulic pressing for uniform density and thickness

Artisan QC

Visual check by artisan of quality and appearance

Independent QC

Detailed check by professional of quality and appearance

CURING

Primary Cure

Tile is left to dry cure for 24 hours

Saturation

Tile is soaked in a water bath until fully saturated

Damp Cure

Tile is left on vertical racks with equal ventilation for long cure to enhance stability

FINISHING

Buffing

Tile is buffed with soft abrasives to ensure no dirt, imperfections or efflorescence remains from cure

Artisan QC

Detailed final quality check under controlled lighting and distance criteria

Sealing

Tile given multiple oil-based penetrating sealer treatments & buffed to remove any excess

PACKING

Export QC

Order is vetted by Export Department & ANSI sample lot checks performed

Packing - Cartons

Bellavita branded cartons with airflow and vapor holes are used for all material

Packing - Pallets

All pallets using fresh & treated wood to ensure customs compliance & protection of goods

Technical Characteristics	ASTM Standard	ASTM Test Result	ASTM/ANSI Test Method
Squareness Tolerance	+/- 1 mm	< 0.5 mm	A 187.1
Warpage Tolerance	+/- 1 mm	< 0.5 mm	A 187.1
Edge Curvature Tolerance	+/- 0.2 mm	< 0.1 mm	A 187.1
Visual Defect (fading or positioning) from Control Sample	< 1 mm	< 1 mm	A 187.1
Abrasion Resistance	As Reported	<0.45 g/cm ²	C 1353
Water Absorption %	As Reported	<10%	A 187.1
Frost Resistance	As Reported	Pass	C1026
Breaking Load	As Reported	>100 daN/tile	C 67 (section 21)
SCOF Coefficient of Friction (dry)	As Reported	0.85	C1028 07
SCOF Coefficient of Friction (wet)	As Reported	0.60	C1028 07

Section 2.ii : Areas of Use

If properly installed and cared for, cement tiles will result in a beautiful, durable, easy to maintain surface that can be enjoyed for many years. The suggested areas of use below are meant as a general guideline for applicable specifications. Each project has different needs and demands based on many factors.

If any special circumstances exist and cause concern for use of cement tiles - please contact bellavita tile at technical-info@bellavitatile.com with your questions.

Product is a naturally porous material and should be expected to patina & weather with age and use

For use on floors and walls, including wet areas
Efflorescence is generally minimal but can occur, especially in wet areas

Substantial fading can occur in either indoor or outdoor installations when in direct exposure to sunlight. UV resistant sealer is recommended for exteriors.

Application	Residential	Commercial	Industrial
Floors	✓	✓	
Wall & Backsplash	✓	✓	✓
Counters	✓	✓	
Pool (Vertical only)			

THE 4 “C’s” CHECKLIST

Clean	Cool	Coverage	Cure
Substrate should be clean, free of contaminants & bondable	Tiles & slab should be moistened before mortar is applied. Moist is not Saturated!	100% coverage is the goal. Corners and edges are critical. Lift tiles to check transfer often	ANSI recommends a floor is traffic free for 72 hours. Use breathable material for protection. Not plastic!

PRE-CHECKS & RESOURCES

TCNA/TTMAC 09300 Tile & Stone handbook is an essential resource to have on hand for any installer and will be referenced in this guide extensively. Visit www.tcna.com or www.ttmac.com to get one if you don't have.

It is the responsibility of the installer to read, understand and follow all guidelines prior to installing the tile.

Materials should be verified on site by owner & installer prior to installation. No claims will be considered by Bellavita Tile once tile has been installed or cut.

Do not store tile outside. Boxes should not be allowed to get wet and allowed to sit as prolonged moisture exposure can cause stains, washed out colors or efflorescence.

SUBSTRATE REVIEW

Preferred substrate is fully cured concrete slab with “troweled smooth” finish. It is advised to check for any capillary action (moisture wicking) in the concrete slab by taping a small airtight section of plastic film to the slab for 24 hours. If moisture is present under plastic film then some method of complete waterproofing (sheet or roll-on) should be used prior to installation. Any surface treatments should be stripped from the slab with a phenol solution or similar to ensure the slab is adequately bondable.

Due to deflection and expansion when exposed to moisture, installation directly over plywood subfloor is not advised. 3/4” Plywood subfloor can be the primary layer in a dual layer subfloor system but the top layer should consist of a cementitious backer unit (CBU). Appropriate CBU's include (but not limited to) WonderBoard, HardiBacker, GreenEboard etc. Isolation & uncoupling membranes such as Ditra can also be used as the secondary layer provided deflection of subfloor is within tolerance. Pre-floated 1^{1/4} - 2” mortar bed on a cleavage membrane is also an acceptable secondary layer.

For wall installations, drywall is an acceptable substrate in dry areas provided an appropriate non-sag mortar is used. For wet areas, CBU's are the recommended substrate.

If installing inside, it is recommended to acclimatize the material to the environment for 24 hours prior to installation

SUBSTRATE PREP

Expansion, Construction, Isolation, Contraction, Generic & Perimeter joints must be allowed for when installing floor tile. Consult 09300 Handbook for detailed explanations on each variety. Perimeter movement joints are mandatory in all interior installations.

Anti-fracture and/or isolation membranes are an important consideration for both interior and exterior installations. The use of one of these membranes with a waterproofing effect can also minimize the appearance of efflorescence in cement tile. Consult 09300 Handbook and manufacturer resources for best practices and suitability

Substrate should be flat and sloped appropriately for the environment prior to installing tiles. Use appropriate screeds, patching compounds or self levellers as necessary to achieve a properly prepared substrate prior to starting installation

Section 3.iii : Installation Methods

There are three acceptable installation methods, the most commonly used is the thin set method. While medium bed is marginally more effective, many contractors and clients prefer thin set due to height considerations and familiarity with methodology.

THIN SET METHOD

Thin set method is normally preferred by installers when fixing ceramic tiles. Select applicable thinset for your area of installation as per 09300 handbook

Always first review and then follow the instructions printed on each bag of thin-set.

Mix the thin-set and clean cool water (or latex additive) together by hand or use a variable-speed electric drill at slow speed (150 to 200 rpm) to a smooth, paste consistency. Let slake or stand 5 -10 minutes, stir again and use. Stir occasionally to keep fluffy, BUT DO NOT RETEMPER (add more water). When properly mixed, troweled ridges on slab will stand with little or no slump.

To avoid entraining air in the mix, use a Bird Cage rather than a Paddle mixing attachment.

Spread thin-set with the trowel's flat side to skin the substrate and break the 'surface tension'.

Run grooves in one direction under each individual tile, which allows air to escape.

Hold the ½" square notched trowel in a near vertical position and finish combing in one direction. Do not allow thin-set to 'skin-over' as that will inhibit bonding of the tile.

Backbuttering each tile is recommended in all applications but It is mandatory to for exteriors in order to obtain a minimum of 95% coverage. Thin-set should be spread onto the back of individual tiles with the flat side of the trowel.

MEDIUM BED METHOD

Medium Bed method is highly recommended for installation of cement tiles when height restrictions and contractor capability allow.

Ideal for setting concrete tiles and large formatted tiles.

Typically used with a ½" x ½" x ½" square notch or ¾" rounded notch trowel.

Most can be used from 1/8" thick to ¾" thick after tiles are beaten into place. All adjustment of tiles, including beating into mortar should be done by hand or with beating block as the impact of even rubber mallets can cause micro fractures in the surface of cement tiles.

Most are formulated with additional larger sand gradation to minimize shrinkage. Available in white and gray, modified and non-modified, normal set and fast set.

Spread mortar and set concrete tiles in the same basic way as a ceramic tile or natural stone.

Backbuttering tiles on the interior recommended, It is mandatory on exterior applications.

MORTAR SET METHOD

Mortar Set Method is normally preferred by Masonry Contractors. With experienced contractors and proper conditions this method is acceptable but there is a higher propensity for efflorescence as well as deformation (cracking) during install.

Available in bags premixed dry or can be mixed on job sites. When mixed on site, use 2½ to 3 parts washed plaster sand to 1 part Portland cement. Use of latex & acrylic concrete additives is strongly recommended. Mortar too rich with cement has a tendency to shrink and crack.

Mortar-Set application can be used at a minimum of ½" thick to a maximum of 1" thick.

Do not allow mortar to lose plasticity and become stiff, as that will inhibit bonding tile. Extreme hot or cold weather affects the mortar's open time. Consider both the air & slabs' temperature & do not spread too much at one time, as heat affects open time.

It is recommended to slurry coat the back of each individual tile for all applications; however, on exterior applications with tiles 8"x 8" or larger, it is mandatory! This ensures ultimate bonding through wet-to-wet mortar contact.

Do not use a rubber mallet directly on tile. Use beating block to adjust tile if needed.

MANDATORY GUIDELINES FOR ANY METHOD

Tile and substrate should be dampened with a sponge prior to applying mortar. Damp does not mean saturated!

Installers should pull randomly from a number of cartons at once during installation to get a pleasing blend of tones.

Change your wash bucket often! Twice as frequently as you would with ceramics. Clean water = clean install.

Tight joint widths are recommended. Unless otherwise expressly requested by the specifier or client, we suggest 1 - 3mm 1/16 - 3/32" joints, especially when using patterned formats.

Press tiles into grooved thin-set or mortar bed, moving back and forth to level and ensure a complete bond. If necessary, use a beating block to adjust the tile. Lift tiles to review coverage and transfer frequently to ensure you're getting the coverage you need.

Due to the handmade nature of the material and the stratified method of production there is a greater degree of thickness variance than commonly found in ceramic tile. Cement tiles can have a variance of up to 1.5mm in thickness so proper care should be taken to avoid lippage during installation.

Do not mark tile surface even with pencil as this can be difficult to clean off. Instead, place your marks so they are cut off by the saw or use painter's masking tape to place your marks. Tape should be tested prior to use to ensure it can come off surface easily.

Clean as you go. Do not leave mortar on the surface of tiles as it becomes more difficult to clean the longer you leave it on the surface. Hotter temperatures mean less time to clean up. Best practice is to clean each tile once it has been finally adjusted before moving on to the next.

Do not leave a cement haze on the tiles overnight as is a common practice with glazed ceramics. Haze will be nearly impossible to remove the next day.

Do not use any acidic cleaners on cement tile. Acids WILL adversely affect the colors and finish of cement tiles forever.

Follow setting material manufacturer guidelines to achieve a full cure before grouting - usually 48-72 hours after install. Allowing a full cure with ventilated joints minimizes the occurrence of efflorescence and helps create a strong cohesive installation system.

If tile needs protection during drying period be sure to use a breatheable material like cardboard instead of poly or plastic film. Air needs in and moisture needs out during this period.

Use non-sanded grouts or fine aggregate grouts for cement tile with fine jointing as recommended in Section 3.iii. If a larger joint width is selected, you may need to use a sanded grout.

Always follow manufacturer's written guidelines on mixing ratios, pot life and cleanup for grouting materials.

Due to the extremely tight joint recommendations using the Bag Grouting method is not recommended. Spread or Smear grouting with a rubber float is the preferred method.

Selecting a grout color that is the same or lighter than the lightest shade in the pattern is recommended. A mockup of at least four pieces is recommended to ensure that the results after smearing grout across the entire surface is acceptable. Mockups are mandatory if a contrasting grout color is selected, especially if a darker color. The darker a grout is, the more likely it is to affect the overall appearance of the tile.

Clean the tile again with clean water after drying period and prior to grouting.

Clean water is essential with grouting cement tile. As stated in Section 3.iii you will likely want to change your wash water at least twice as frequently as you would if working with ceramics. Plan for it!

Section 4.ii : Grouting

Lightly dampening the surface of the tile with your wash sponge can help the grout to slide smoothly on the tile's surface as well as help speeding the wash process. Use of a "grout release" product for this step can dramatically improve cleanup times and improve consistency of colors after grouting.

Use a soft rubber float held at an angle and press grout into joints at a 45° angle to the joint, making sure that the joints are completely full.

Do not try to spread joints only as this can cause a "picture frame" effect as grout will affect the color of the tile slightly. Instead smear grout across entire installation evenly to ensure a consistent aesthetic is achieved.

Do not overspread! Work in smaller areas and wash BEFORE grout loses plasticity instead of allowing to haze as is common with ceramic tile. Primary wash should remove most excess grout and shape joints. Subsequent washes should be done with a separate wash bucket of clean water. Use a single wipe per side of sponge between rinses. Do not use too much water during washing as it can weaken the grout and cause shrinkage.

Ensure ALL grout haze is cleaned from tile surface before leaving the site. Unlike with ceramics, grout haze will not cleanup from tile's surface the next day.

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Grouting Guidelines

Section 4.iii : Final Cure

The final cure of the completed tile assembly is critical to the lifelong success of the job and full realization of the investment. If the entire assembly is handled appropriately as described in this guide, your cement tile installation should provide beautiful service for many decades.

Read and follow grout manufacturer's recommendations to achieve a full cure of the material prior to surface filling/sealing of the assembly. The timeframe recommended for a full cure is generally at least 48 to 72 hours.

Installation should be protected with a breathable carboard during the curing process as plastic or poly sheeting inhibits the drying process.

If possible a damp cure (periodic misting of tiles during curing period) will achieve the best results and minimize grout cracking or shrinkage.

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Post Installation Protection

Section 5.i : Selecting a Protection Coating

Bellavita Tile's encaustic cement tiles are treated with an oil-based penetrating sealer before packaging. But the frequent washing and abrasion during the installation process will have removed the vast majority of this sealer so the product should be re-sealed to adequately protect your investment. If you select a water-based sealer, a stripper must be applied first. Different products offer different benefits so selecting your sealer is an important step in the process. As with grouting, we suggest a mockup to ensure that the results after application of the sealer are as desired.

SURFACE FILLER & SEALER CHOICES

Natural Look	Low/Medium Sheen	High Sheen	Wet Look (darkener)
Use a penetrating sealer like Sealer's Choice Gold (Aquamix)	Sealer or wax can be used like Seal & Finish LS (Aquamix) Choice depends on traffic	Sealer or wax can be used like Floor Shine & Hardener (Aquamix) Choice depends on traffic	Use a penetrating enhancer like Enrich & Seal (Aquamix)

Section 5.ii : Application of Protectorant

Clean the floor thoroughly before applying a protectorant with clean water to which a chlorine-free, non-acidic detergent has been added. Use a scouring pad (Scotch-Brite or similar) or glass paper (maximum grit 180) on stubborn spots or stains.

Apply protectorant following manufacturer's written recommendations. Multiple coatings will likely be necessary.

Ensure that excess sealer or wax is buffed off the surface before completion.

6

Ongoing Maintenance

Section 6.i : Maintenance & Troubleshooting

NEVER use acidic cleaners on cement tile - even for efflorescence. Despite being the quickest way to deal with most common maintenance issues, acids are extremely hazardous to cement tiles and will irrevocably mar the surface finish and coloration of this material.

ROUTINE CLEANING

Use a neutral cleaner (pH 7.0) for routine cleaning of concrete tile. Follow product label directions for best results.

Sweep or vacuum floor frequently to remove dirt and loose soil. Promptly wipe up any spills to minimize risk of staining. Place protective felt pads on legs of moveable furniture. For routine cleaning minimize the amount of solution used on floor, damp mop and dry promptly for best results.

PERIODIC HEAVY CLEANING

For areas that have been neglected or do not respond to routine maintenance and neutral cleaners, use of an alkaline cleaner (high pH) is recommended. A scrub brush will aid in this process.

Always sample a small section first.

Will remove wax-type floor finishes.

GROUT RESIDUE (cement grout)

A grout haze remover may be necessary after initial cure of one week

Always sample a small section first.

Will remove wax-type floor finishes.

REMOVAL OF PROTECTORANTS & HEAVY GREASE

Use: Alkaline (ammoniated-type cleaners).

Always sample a small section first.

Repeat process may be necessary for heavy build-up.

REMOVAL OF DEEP SET STAINS

Use: (a) gel-type stripper, (b) paint, varnish, sealer remover (c) poultice.

Always sample a small section first.

Apply stripper or poultice paste to stained area. Repeat process if necessary.

EFFLORESCENCE

Use: Scouring pad (ScotchBrite) or similar and clean hot water

These hard water mineral deposits are generally soluble salts from within the concrete substrate or cement tile itself. They will naturally rise to the surface and should be cleaned off regularly to avoid build up. Penetrating sealer will inhibit occurrence as will regular scouring of surface.