Creative Concrete Concepts

CrystalTop

Epoxy Terrazzo

TECHNICAL DATA SHEET

DESCRIPTION • *CrystalTop Epoxy Terrazzo* is a decorative flooring system comprised of a three-pack system composed of a thin-set, two-component solvent-free epoxy matrix, fillers, and decorative aggregates. The epoxy matrix is mixed with the fillers and marble, granite, crushed stone, onyx, and/or glass chips; then poured in place, cured, ground, and polished to expose the aggregates.

USES • *CrystalTop* is used as a floor finish for interior applications ranging from residential to heavy commercial such as malls, hospitals and schools. *CrystalTop* is typically installed in a nominal thickness of 12 mm over existing surfaces and grinded down 2 mm on average. Lower or higher thicknesses are also possible.

ADVANTAGES •

- ✓ Extremely durable and long lasting.
- ✓ Chemically and abrasion resistant.
- ✓ Unparalleled design freedom.
- ✓ Seamless, anti-bacterial, hygienic flooring.
- ✓ Low life-cycle cost.
- ✓ Minimum need for maintenance.
- ✓ Wide choice of matrix colors and aggregates.

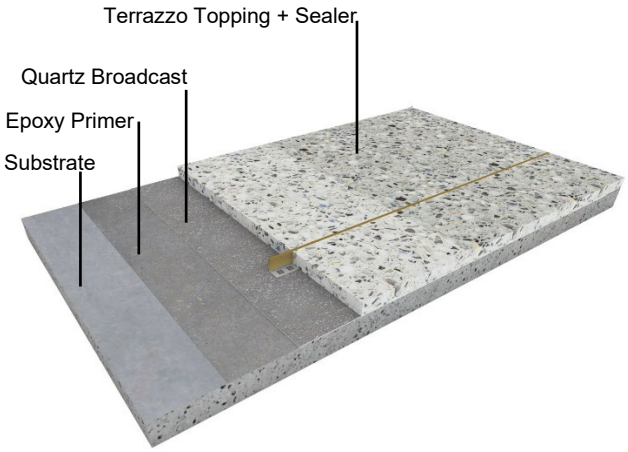
COVERAGE • Coverage will vary depending on substrate surface profile, aggregate size and type, surface finish and preparation method. Dominant coverage rate is approximately 0.9 m^2/25 kg kit at 12 mm thicknesses (pre-grinding).

LIMITATIONS • Concrete substrate must be allowed to cure for a minimum of 28 days. UV radiation may cause discoloration on certain colors. *CrystalTop* must be applied over structurally sound and non-moving surfaces. Do not apply in areas subject to negative hydrostatic pressure. Concrete substrate must have an efficient moisture/vapor barrier installed directly under the slab. Cracks or moving joints in the existing substrate may reflect through the *CrystalTop* overlay. *CrystalTop* must not be applied in thicknesses less than 8 mm in order to end up with a 6 mm thickness after the grinding and polishing processes, otherwise there is the risk of exposing high areas of the substrate after grinding and polishing. Substrate surface's maximum undulation must not exceeding 3 mm every 3 meters.

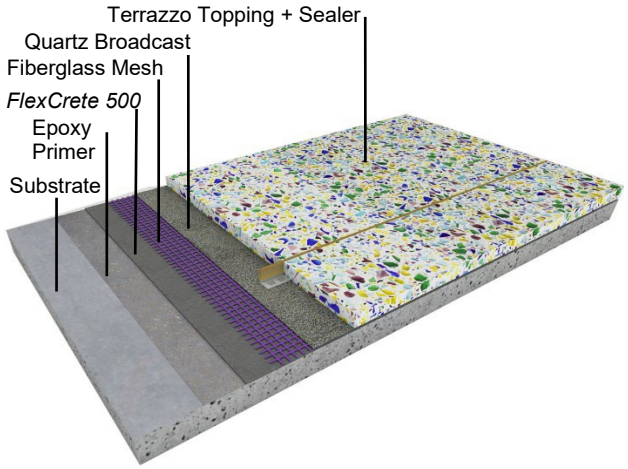
Do not apply if ambient temperature is expected to drop below 10°C during installation, or if rain is expected in the proceeding 24-hour period after application. Do not mix or apply when ambient temperature is expected to exceed 40°C.

SYSTEM DETAIL • *CrystalTop* may be installed with or without an underlying crack isolation membrane composed of *FlexCrete 500 Elastomeric Epoxy Coating* as shown in the illustrations below. The crack isolation membrane must be installed when the joints in the concrete substrate will not be extended into the terrazzo topping by installing divider strips, or when the concrete substrate is prone to cracks or other defects. *FlexCrete 500* also functions as a vapor barrier membrane. Please refer to drawings CCC-TRZ-DT-001/002 for full system details.

Installation w/o Flexible Epoxy Membrane:



Installation w/ Flexible Epoxy Membrane:



PHYSICAL PROPERTIES •

Mixed Density	1.65 ± 0.05
Solids Volume	100%
Application Temperature	10°C to 60°C
Pot Life	1 hour at 20°C 40 minutes at 35°C

Tack Free Time	4-5 hours at 20°C 3-4 hours at 35°C
Initial Hardness	24 hours at 20°C 16 hours at 35°C

Neat Resin Properties:

Shore D Hardness ASTM D 2240	74
Compressive Strength ASTM D 695:02	88.9 N/mm^2
Tensile Strength ASTM D 638	24.5 N/mm^2
Elongation ASTM D 638	35.6%
Pull Off Strength ASTM D 4541:95	3.6 N/mm^2
Flexural Strength ASTM D 790	50.5 N/mm^2
Flexural Modulus of Elasticity ASTM D 790	568 MPa

System Properties w/ Clear Glass Aggregates:

Shore D Hardness ASTM D 2240	65
Compressive Strength ASTM D 695:02	86.2 N/mm^2 ± 5
Tensile Strength ASTM D 638	16.6 N/mm^2
Elongation ASTM D 638	12%
Pull Off Strength ASTM D 4541:95 (w/ epoxy primer + silica sand)	4.3 N/mm^2 (Concrete failure)
Flexural Strength ASTM C 580	24.1 N/mm^2
Flexural Modulus of Elasticity ASTM C 580	10.2 Gpa
Impact Resistance (ISO 6272)	No sign of cracking to 1000 mm height
Water Permeability (DIN 1048)	Nil
Water Vapor Transmission (ASTM E96-95)	Nil
Abrasion Resistance (ASTM D 4060)	0.03 g loss per 1000 cycles
Volatile Organic Compound (USEPA 24)	None detected
Indentation (MIL-D-3134 F 4.7.4), 150 kg/cm^2 for 30 min.	No indentation observed
Critical Radiant of Flux (ASTM E 648)	< 1.0
Resistance to Elevated Temperature (MIL D3134F)	No slip or flow @ 70°C
Coefficient of Thermal Expansion (ASTM D 696)	3.9 x 10^{-6}
Flammability (BS EN ISO 11925-2)	Non-flammable

CHEMICAL RESISTANCE • The sealer coat on the surface of *CrystalTop* provides additional chemical and stain resistance. CCC sealers have been thoroughly tested for chemical resistance per ASTM D 1308 procedures; please refer to the technical data sheet of the chosen sealer coat for more information.

SURFACE PREPARATION • All bases must be fully cured for a minimum of 28 days, sufficiently rigid, and clean of any surface contamination such as oil, dirt, grease, coatings, curing compounds, and laitance that may prevent proper adhesion. The use of curing agents or additives could prevent bonding of the overlay to the substrate. Dense, smooth surfaces, and those retaining excessive amount of form release agent can cause delamination from the base. Any painted or coated surfaces should be sandblasted and/or pressure washed to remove existing coatings. Use of detergents or soap is not recommended as they may leave a film that can cause bonding failure. The substrate should also be visibly dry. Concrete slabs, on or below grade, must have an efficient moisture/vapor barrier placed by the general contractor directly under the slab.

The concrete substrate should have a steel trowel finish. The surface should be prepared mechanically by grinding or shot blasting to achieve a rough profile and remove laitance, curing agents, or contaminants.

INSURE THAT THE SURFACE MAXIMUM VARIATION DOES NOT EXCEED 3 MM EVERY 3 METERS. Use mechanical grinding along with patching to achieve the required surface level. Use only epoxy based products for patching such as *MortCrete 3000 Multi-purpose Epoxy Mortar* and/or *EpoCrete 5000 Epoxy Screed*; do not use cement-based patching products of any sort.

Damaged areas, surface irregularities, and cracks must be repaired with *MortCrete 3000 Multi-Purpose Epoxy Mortar* prior to application of the primer. Remove all unsound concrete. Patches shall be flush with the surrounding surface and shall match the texture of existing surfaces.

Surrounding areas should be covered and protected from material spills and equipment contact. Rope off work area, remove surrounding vehicles, and close off to traffic.

DIVIDER STRIPS • If a crack isolation membrane will not be sued, it is recommended to place divider strips precisely over concrete control joints, expansion joints, and at termination joints. For expansion joints or wide joints, place two divider strips back-to-back. Dividers must also be used to separate different colors or as design accents, which act as decorative elements and do not function as crack preventers. If the design calls out for a joint-free look where a control joint in the concrete coexists, use of a divider strip may be negated by covering the control joint with a mesh and flexible epoxy coating (*FlexCrete 500*). For additional assurance against reflective cracking into the terrazzo layer or if the concrete doesn't have well laid out control joints, it is recommended to place

the flexible membrane over the entire concrete surface with fiber glass mesh embedded into the coating (see below for additional details). Divider strips are available in a variety of sizes and shapes; most common are L-angled strips in zinc or brass.

The strips must be securely and permanently fastened to the substrate with a high-strength epoxy adhesive; mechanical fasteners may also be used for additional security. When using standard type strips (non-L-angled), saw-cut at least 10 mm deep grooves wherever a design element exists or at the end of a designated pour. Blast the groove with an air gun, and remove all the dust. Fasten the strips in the groove with a fast setting epoxy compound while making sure the top of the strip is at the level of the intended application thickness. It is recommended that the divider strips be installed such that their top is at the pre-grinding level, so that they provide a level guide for casting the terrazzo overlay.

SURFACE PRIMING • The surface must first be primed with *EpoPrime EP Epoxy Floor Primer* in order to unify the surface absorption and enhance bonding. Please refer to the relevant CCC data sheet for application instructions of the primer. Priming the concrete surface is not necessary if an epoxy crack isolation membrane with silica sand aggregates will be installed as outlined below.

FLEXIBLE MEMBRANE (OPTIONAL) • Cracks or movement in the substrate will translate directly through the overlay surface. Therefore, if extensive substrate cracking and movement are anticipated, the substrate may be coated with *FlexCrete 500 Epoxy Polysulfide Coating*. Imbed a high quality fiberglass mesh in the *FlexCrete 500* coating such as *ShieldCrete SD* 125 g mesh or *InsuCrete Standard* 160 g mesh. Use a trowel or roll to spread the *FlexCrete 500* over the fiberglass mesh. DO NOT THICKEN; the *FlexCrete 500* coating should be just thick enough to cover the mesh. For additional thickness, apply subsequent coatings after the first coat has adequately cured. While the *FlexCrete 500* coating is still wet, sprinkle coarse silica sand aggregates on the surface for good mechanical keying. Brush and vacuum off any loose silica aggregates the next day after the epoxy coating has cured. Please consult the relevant CCC data sheet for application instructions.

MIXING • *CrystalTop* is composed of three packs consisting of the epoxy resin (part A), epoxy hardener (part B), and aggregates with fillers (part C – the fillers are packed in plastic bag inside the pail containing the aggregates), which must be mixed in the exact sequence prescribed. First mix the contents of the resin container (part A) for a few minutes by mechanical means to re-disperse the pigment. The entire contents of the hardener container (Pack B) must then be poured into the resin container (Pack A) and the two components mixed thoroughly for at least 3 minutes. Use a heavy duty slow speed power drill with a jiffy mixing blade. Mix the two components in the quantities supplied taking care to ensure hardener container is scraped clean. Do not add solvent thinners at any time. After the hardener and resin have been mixed thoroughly, add to the aggregates and fillers (Pack C) while mixing. Continue mixing for another two to three minutes while moving the mixer horizontally and vertically around the mixing pail to insure thorough mixing. For best results, use of a drum mixer is highly recommended.

APPLICATION • Application temperatures should be between 10°C and 40°C. It is highly recommended to test a small area to ensure bonding ability and satisfaction of appearance before complete application.

CrystalTop is installed in nominal thicknesses of 10 or 12 mm (other thicknesses are possible upon special request). *CrystalTop* must be applied on a surface primed and prepared as outlined above. If a crack isolation membrane with silica aggregates is not installed first, the terrazzo mix must be installed on the primer while it is still tacky. Pour the homogeneous *CrystalTop* mix and spread using a rake and a lightweight aluminum screed to a thickness at least 2 mm greater than the desired final thickness after grinding and polishing. The mix should just slightly top or be at the level of the divider strips. Generally, allow 1-2 mm to be removed by the grinding process. Smooth out the surface immediately with a steel trowel to as flat a surface as possible. Insure that all voids and corners formed by the design elements are completely filled by the mix. The topping must be left to cure for a minimum of 24 hours at 25°C before any grinding or polishing; lower temperatures will require longer curing times.

GRINDING & POLISHING • Grinding must not take place before the topping has been allowed to cure for a minimum of 24 hours at 25°C – longer curing times would be required at lower ambient temperatures. Use only the highest quality diamond tools and professional, multi-head, floor grinding machines for good leveling and finish.

Start grinding with coarse metal bond diamond tool; 40 grit is usually a good starting point. Always grind progressively through all the pads to the finest. Jumping from a very coarse pad to a much finer pad or skipping stages will not remove the scratch marks left by the previous step. A good rule of thumb is to no more than double the grit number with each successive polishing step; for example, the following grit number sequence could be used: 40, 80, 150, 200, 400. The initial grinding stages with metal-bond

tools may be performed dry at low speeds; consult the machine and diamond tools manufacturer for their recommendations. Polishing stages with resin-bond tools must be performed wet only. Typically polishing only to 100 or 200 grit with resin metal pads should be adequate Keep in mind that the adhesion of the sealer coat diminishes with higher grit number polishing; therefore, it is not recommended to polish to more beyond 400 grit.

The initial grinding stages with metal-bond tools (40 and 80 grit) will leave pinholes in the matrix and may remove some of the aggregates. These holes must be filled with a grout composed of the epoxy and filler; grout kits are supplied separately. After mixing the resin and hardener parts add the filler slowly and mix to a thorough consistency. Use a steel trowel or scrapper to apply the grout to the surface, insuring that any excess grout is scrapped off the surface. Allow 24 hours of curing time at 25°C, after which the excess grout is removed with the final metal-bond stage (150 grit). Re-grout if necessary before moving on to the polishing with the resin-bond tools.

After all grinding, grouting, and polishing is completed, generously flush the surface with plenty of water to remove any residue from the surface. Allow to dry overnight before sealing.

SEALING • It is highly recommended to apply a sealer coat to protect the epoxy terrazzo surface against staining and bring out the color of the decorative aggregates. **T**he surface may be sealed with *A-Z Ultra Sealer Solvent-Borne Acrylic Sealer*, *A-Z Mega Sealer Acrylic Urethane Sealer, ElastoCrete 212 Water Based Polyurethane*, *EpoCrete 100W Water Based Epoxy*, or any combination thereof granted the compatibility of the sealer coats (e.g. the terrazzo surface may be sealed with a coat of *EpoCrete 100W* followed by *ElastoCrete 212*).

CURING • At 20°C, *CrystalTop* can be walked on after 24 hours. Full mechanical resistance will be reached after 7 days, and chemical resistance will be reached after 28 days. Lower temperatures will require longer curing times.

CLEANING • Clean all tools and equipment promptly with an organic solvent.

STORAGE& SHELF LIFE • Keep material covered and off the ground to prevent exposure to moisture. Store at 25°C in a dry, covered area away from direct sunlight. Expected shelf life is 12 months from the date of purchase when stored in original unopened packaging under recommended storage conditions.

SAFETY PRECAUTIONS • KEEP OUT OF REACH OF CHIDREN. DO NOT TAKE INTERNALLY. The application of material should be under good ventilation. Avoid inhalation of the vapors. Use goggles and vinyl gloves. In case of contact with eyes, rinse immediately with plenty of clean water, do not use solvent and seek medical attention immediately. The product complies with environmental and occupational health & safety standards ISO 14001 and OHSAS 18001.

FIRST AID: Eyes – Do not rub eyes, immediately flush with fresh water and seek medical attention immediately. Skin – Wash with soap and water. Inhalation – If experience difficulty breathing move to fresh air. If symptoms persist, seek medical attention.

PACKAGING • *CrystalTop* is typically sold in 25 kg kits or as per customer requirement.

Creative Concrete Concepts
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