SECTION 09 66 00

THIN-SET EPOXY TERRAZZO

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\*\* NOTE TO SPECIFIER \*\* Key Resin Co.; Fluid-applied resinous flooring for concrete floors and wall surfacing/coating systems.
 This section is based on the products of Key Resin Co., which is located at:
4050 Clough Woods Dr.
Batavia, OH 45103
Toll Free Tel: 888-943-4532
Tel: 513-943-4225
Fax: 513-943-4255
Email: [request info (sales@keyresin.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Key+Resin+Co.&coid=40601&rep=&fax=513-943-4255&message=RE:%20Spec%20Question%20(09400krc):%20%20&mf=)
Web: <https://keyresin.com>
 [ [Click Here](https://www.arcat.com/arcatcos/cos40/arc40601.html) ] for additional information.
Key Resin Company is a leading international supplier of fluid-applied resinous flooring, epoxy terrazzo, moisture vapor control systems and polymer resin coatings for concrete floors and walls. It is our goal to offer the best in product, experience, service, and expertise in the industry. By accomplishing this goal, we will provide the best possible solutions for your project requirements. This Internet-based catalogue has been designed to provide you with product and system data and specifications for our complete line.
KEY THIN-SET EPOXY TERRAZZO SYSTEMS are highly decorative flooring systems that exhibit outstanding durability and wear. Installed at 1/4 inch (6 mm) to 3/8 inch (9 mm), KEY EPOXY TERRAZZO has a very low life-cycle cost and contributes to various USGBC LEED points.
KEY QUARTZ SYSTEMS are a series of decorative floor surfacing systems which offer distinctive and pleasing appearance in addition to the outstanding performance characteristics common in Key Resin Company flooring systems. KEY QUARTZ SYSTEMS are generally characterized by clear resin finishes combined with colored aggregates to provide attractive and seamless color patterns.
KEY CHIP SYSTEMS are a series of decorative flooring systems consisting of colored chips/flakes broadcast into epoxy, urethane cement or MMA resin, sealed with clear topcoats. The thickness varies from 20 mils to 1/4 inch depending on expected service, topcoats vary depending on expected service and exposure to chemicals and cleaning agents.
KEY MORTAR SYSTEMS are 100 percent solids epoxy/aggregate systems ideal for areas needing protection from high traffic, impact, thermal shock, and chemical attack. Designed for a variety of applications, KEY MORTAR SYSTEMS are highly versatile flooring systems which can be tailored to specific needs.
KEY URECON SYSTEMS are urethane modified, cementitious systems ideal for areas needing protection from high traffic, impact, thermal shock, moisture vapor tolerance and chemical attack. Designed for a variety of applications, KEY URECON SYSTEMS produce a dense, non-porous wear surface ideal for commercial kitchen, food handling/processing, and similar areas.
KEY SECONDARY CONTAINMENT SYSTEMS are 100 percent solids chemical resistant epoxy/aggregate systems ideal for areas needing protection from chemical spills, high traffic, impact and thermal shock. Specially formulated bis-F and novolac epoxy resins for high chemical resistance applications, KEY RESISTANT SYSTEMS and KEY CONTAIN SYSTEMS are highly versatile flooring systems which can be tailored to meet specific needs.
KEY VINYL ESTER SYSTEMS utilize Key Resin Company's vinyl ester resin in a wide range of industrial applications requiring the ultimate in chemical resistance and high temperature performance. KEY VINYL ESTER SYSTEMS can be installed as a high-build coating, fiberglass reinforced lining, slurry, or mortar to meet your various chemical and heat resistance needs.
KEY LASTIC SYSTEMS are elastomeric urethane and flexible epoxy systems specially formulated for areas with high traffic, impact, structural vibration, or that require ergonomic comfort under foot, noise reducing performance, and crack resistance such as mechanical equipment rooms, showers, parking structures, hallways, and healthcare facilities. KEY LASTIC SQT is a decorative elastomeric resin mortar with colored rubber chips, grinding the surface exposes the decorative colored chips to create a smooth finish.
KEY CONDUCTIVE and ESD (Electro-Static Dissipative) SYSTEMS are epoxy or urethane systems used to create non-sparking floors to prevent explosions in hazardous environments or to dissipate the build up of static electricity to prevent damaging discharges to electronic components.
KEY MMA (Methyl Methacrylate) SYSTEMS are rapid curing acrylic resins used where fast installation times are of critical importance. KEY MMA SYSTEMS have zero VOC, cure in about one hour, and are able to cure down to minus -20 Fahrenheit in freezers and other cold environments. KEY MMA SYSTEMS are UV light resistant and are suitable for exterior use.
KEY COATING SYSTEMS consist of a variety of epoxy, novolac, polyurethane, acrylic and vinyl ester coatings for floors and walls. KEY COATING SYSTEMS protect floors and walls from chemical attack and mild abrasion. Typical coating systems vary from Thin-Film 6-7 mils (.15 mm) up to High-Build 30+ mils (.76 mm) dry film thickness and are suitable for light to medium duty service.
KEY MOISTURE VAPOR CONTROL SYSTEMS allow the contractor to install any moisture sensitive epoxy or other floor covering system such as VCT, wood or sheet vinyl on concrete with excessive moisture vapor emissions or moisture content. KEY EPOCON SL MOISTURE VAPOR CONTROL SYSTEM and KEY EPOCON FLOORING SYSTEMS incorporate the unique epoxy technology of KEY EPOCOAT resin. Moisture sensitive floor covering systems can be installed on new concrete (5 days old) without any fear of moisture entrapment. KEY EPOCON SL can be used underneath every type of Key Resin Flooring System and other floor coverings such as VCT, sheet vinyl, wood and carpet. Other KEY MOISTURE VAPOR CONTROL SYSTEMS include KEY URECON SLT and KEY #635 MVT.
ACCESSORY MATERIALS: Key Flexible Epoxy #580 Crack Isolation & Waterproofing Membrane. Key Epoxy Crack Filler #715. Key Semi-Rigid Epoxy Joint Filler #780.
KEY RESIN FLOORING and COATING SYSTEMS are easily cleaned with neutral soaps or detergents. Routine mechanical scrubbing is recommended for all surfaces having a non-skid texture. If floors become slippery due to animal fats, oil, grease, or soap film, promptly remove contaminant and rinse thoroughly. Waxing is optional. Long periods of heavy traffic may cause wear patterns necessitating a maintenance application of a finish coat. Refer to Key Resin Technical bulletins #3 and #3-A for further information.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Poured in place epoxy terrazzo flooring and integral formed base with joint, edge, and termination strips.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
		2. Section 07 91 26 - Joint Fillers.
		3. Section 09 29 00 - Gypsum Board.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. NTMA: National Terrazzo and Mosaic Association.
		2. ASTM C 24l: Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic.
		3. ASTM D 56: Standard Test Method for Flash Point by Tag Closed Cup Tester.
		4. ASTM D 412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
		5. ASTM D 635: Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
		6. ASTM D 695: Standard Test Method for Compressive Properties of Rigid Plastics.
		7. ASTM D 696: Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degree C and 30 degree C With a Vitreous Silica Dilatometer.
		8. ASTM D 1308: Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
		9. ASTM D 2240: Standard Test Method for Rubber Property-Durometer Hardness.
		10. ASTM F 1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
		11. ASTM F 2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
		12. ACI Committee No. 403 Bulletin Title No.59
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. [ Product Data ]: Manufacturer's data sheets on each product to be used, including:
			1. Manufacturers Application Instructions: Submit descriptive data and specific recommendations for mixing, application, curing including any precautions of special handling instructions required to comply with the Occupational Safety and Health Act.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
		3. Shop Drawings: Shop Drawings shall be furnished showing installation of cove base and termination detail, and details at floor material transitions and abutting adjoining equipment.
			1. Locate and provide detailing for flexible joints required of flooring in area of installation.
			2. Installer to verify locations of all flexible joints required by the provisions of this Section and by the recommendations of the related material manufacturers.
				1. Joint locations are required whether shown or not in Contract drawings.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified.
			1. Submit maximum of three samples, 6 inches by 6 inches for each color and type of terrazzo available from manufacturer's full range.
			2. Submit two 6-inch lengths of each type and kind of divider strips available.
		2. Verification Samples: For each finish product specified,.
			1. Submit maximum of three samples, 6 inches by 6 inches for each color and type of terrazzo as specified.
			2. Submit two 6-inch lengths of each type and kind of divider strips as specified.
		3. Maintenance Literature:
			1. Submit two copies of NTMA and/or manufacturer's maintenance recommendations.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications:
			1. Manufacturer shall provide materials in accordance with NTMA standards.
			2. Materials used in the floor surfacing shall be the products of a single manufacturer.
		2. Installer Qualifications:
			1. Acceptable installer shall be a contractor member of the NTMA to perform all work in accordance with NTMA standards.
			2. If installer is not a contractor member of the NTMA, he shall submit a list of completed projects of similar magnitude and complexity.
			3. Installer shall be acceptable to Architect and Key Resin Company.
			4. Installation shall be performed by an applicator with minimum 3 years experience in work of similar nature and scope. Installer shall be approved by the manufacturer of the floor surfacing materials. The Contractor shall furnish a written statement from the manufacturer that the installer is acceptable.
			5. Contractor to have proven experience with specified system.
			6. Mock-up: Prior to starting application of flooring, provide full scale portable mock-up to establish acceptable quality, durability, and appearance.
		3. Certification:
			1. Manufacturer shall furnish certification attesting that materials meet specification requirements.
			2. Manufacturer shall furnish properly labeled material and Material Safety Data Sheets which comply to current state and federal requirements.
			3. Manufacturer shall submit certification that installer is an approved applicator of material selected.
		4. Pre-Construction Meeting:
			1. Pre-job meeting between Contractor, Architect, and installer shall be held to discuss concrete substrate, location of joints and/or saw cuts to minimize sub-floor cracking and locations of control joints and strips in terrazzo surface.

\*\* NOTE TO SPECIFIER \*\* Include an installed mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how an installed mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide an installed mock-up for evaluation of surface preparation techniques and application workmanship.
			1. Finish areas designated by Architect.
			2. Mock-up size shall not be less than 50 square feet.
			3. Acceptable mock-up to be standard of quality for installed work.
			4. Unacceptable installed work to be removed and replaced or refinished until acceptable.
	1. DELIVERY, STORAGE, AND HANDLING
		1. All materials shall be delivered to project site in original manufacturer's sealed containers including type of material, batch numbers, date of manufacture, and pertinent labels intact and legible.
		2. Store materials in dry protected area at a temperature between 50 degree F (10 degrees C) and 80 degree F (27 degrees C).
		3. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.
		4. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
	2. PROJECT CONDITIONS
		1. Maintain the ambient room and floor temperature at 60 degree F (15 degrees C) or above for a period extending from 72 hours before, during and after floor installation. Concrete to receive surfacing shall have cured for at least 28 days and be free of all curing compounds.
		2. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
	3. WARRANTY
		1. One year from date of completion of terrazzo installation.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Key Resin Co., which is located at: 4050 Clough Woods Dr.; Batavia, OH 45103; Toll Free Tel: 888-943-4532; Tel: 513-943-4225; Fax: 513-943-4255; Email: [request info (sales@keyresin.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Key+Resin+Co.&coid=40601&rep=&fax=513-943-4255&message=RE:%20Spec%20Question%20(09400krc):%20%20&mf=); Web: <https://keyresin.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. SYSTEM
		1. Acceptable Product: Key Epoxy Terrazzo as manufactured by Key Resin Company.
		2. Terrazzo Selection:

\*\* NOTE TO SPECIFIER \*\* Select color and design from NTMA Terrazzo Information Guide or Color Palette or custom sample supplied by manufacturer. Any deviation from NTMA plates shall be clearly identified. Delete one of the two following paragraphs.

* + - 1. NTMA Plate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
			2. Key Resin Sample \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	1. MATERIALS
		1. Primer: Only as recommended by the manufacturer.
		2. Epoxy resin mixed according to manufacturer's recommendation and tested without aggregate added. All specimens cured for 7 days at 75 degrees F (24 degrees C) plus or minus 2 degrees F and 50 percent plus or minus 2 percent R.H. The product shall meet the following requirements:
			1. Hardness ASTM D 2240 using 60-85. Shore D Durometer
			2. Tensile Strength Specimen made using 3000 psi (21 MPa) minimum.
			3. "C" die listed in ASTM D412 Compressive ASTM D 695, 10,000 psi (70 MPa) minimum. Strength Specimen B cylinder
			4. Chemical Resistance ASTM D 1308: 7 days at room temperature by immersion method have no deleterious effects.
			5. The following contaminants tested: Distilled Water 1% Soap Solution; Mineral Oil 10% Sodium Hydroxide; Isopropanol 10% Hydrochloric Acid; Ethanol 30 % Sulfuric Acid; .025 Detergent Solution
			6. Bond Strength: When tested in accordance with Field Test Method for surface soundness and adhesion as described in ACI Committee No. 403 Bulletin Title No.59-43 (Pages 1139-1141) the Epoxy Terrazzo shall comply with the following value: 100 percent concrete failure minimum, with 300 psi (2.1 MPa) minimum tensile strength.
		3. Epoxy Resin mixed according to manufacturers recommendations and blended with 3 volumes of Georgia White marble blended 60 percent #1 chip and 40 percent #0 chip, ground and grouted with epoxy resin. Finishing to a nominal l/4 inch (6 mm) thickness. All specimens cured for 7 days at 75 degrees F (24 degrees C) plus or minus 2 degrees F and 50 percent plus or minus 2 percent R.H. The finished epoxy terrazzo shall meet the following requirements.
			1. Flammability: When tested in accordance with ASTM D 635, the Epoxy Terrazzo shall comply with the following value: Self-extinguishing, extent of burning .025 inches (.64 mm) maximum.
			2. Thermal Coefficient of Linear Expansion: When tested in accordance with ASTM D 696, the Epoxy terrazzo will comply with the following value: 25 x 10-6 inches per inch per degree to 140 degrees F (64 x 10-7 mm per mm per degree to 60 degrees C).
		4. Marble Chips or Glass Aggregate:

\*\* NOTE TO SPECIFIER \*\* See product information for chip size.

* + - 1. Size: To conform to NTMA gradation standards.

\*\* NOTE TO SPECIFIER \*\* This test indicates the abrasion resistance of marble chips.

* + - 1. Hardness according to ASTM C 24l Ha-10 minimum.
			2. 24 hours absorption rate not to exceed 0.75 percent.
			3. Chips shall contain no deleterious or foreign matter.
			4. Dust content less than 1 percent by weight.
		1. Strips:

Note: Select gauge white alloy of zinc or plastic. Consult with manufacturer of epoxy resin if brass strips are desired. Select gauge from following: 18, 16 or 14 B & S gauge or l/8 (3 mm), l/4 (6 mm), or 3/8 (9 mm) inch heavy top "L" or "K" type. Construction joint double "L" strips, back to back: 16 gauge white alloy of zinc material.

* + - 1. Stop and divider "L" strips: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ gauge.
		1. Terrazzo Cleaner:
			1. pH factor between 7 and 10.
			2. Biodegradable and phosphate free.
		2. Sealer:
			1. pH factor between 7 and 10.
			2. Sealer shall not discolor or amber.
			3. Flash Point: ASTM D 56, 80 degrees F (27 degrees C) minimum.
			4. Special stain and/or chemical resistant sealers shall be used for areas requiring resistance to iodine or Betadine.
1. EXECUTION
	1. EXAMINATION
		1. Examine areas to receive terrazzo for:

\*\* NOTE TO SPECIFIER \*\* Cracks in substrate will usually be transmitted through topping to surface. Flexible membrane over cracks can be used to minimize chance of subfloor cracks transferring to the terrazzo surface.

* + - 1. Defects in existing work that affect proper execution of terrazzo work.

\*\* NOTE TO SPECIFIER \*\* Subfloor shall not vary more that 1/4 inch (6 mm) from true plane in 10 feet (3048 mm). Epoxy thin-set terrazzo is not intended to level substrate and will only follow the contour of the concrete slab. If for any reason the subcontractor questions the suitability of the substrate, any work required to eliminate nonconformity of subsurface specifications is the responsibility of others. Any materials used to correct nonconformity must be compatible with terrazzo system selected and be approved by the epoxy terrazzo material supplier.

* + - 1. Deviations beyond allowable tolerances for the concrete slab work.
		1. Do not begin installation until substrates have been properly prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	1. PREPARATION
		1. Prepare substrate to receive epoxy terrazzo in accordance with manufacturer's recommendations.
		2. Acceptable Substrates:
			1. Level tolerance: Concrete sub-floor shall be level with a maximum variation from level of 1/4 inch (6 mm) in 10 feet (3048 mm). Any irregularity of the surface requiring patching and/or leveling shall be done using material approved by the manufacturer.
			2. Concrete floor shall have a steel trowel finish.
			3. Concrete shall be cured a minimum of 28 days. No curing agents shall be used in areas to receive terrazzo.
			4. Concrete slab shall have an efficient moisture barrier of minimum 10 mils (.2540 mm) placed directly under the concrete slab. Do not use vapor barrier manufactured with recycled content. Testing shall be done to verify that the moisture vapor emission rate of the slab does not exceed that as recommended by the manufacturer at time of installation of the epoxy terrazzo flooring. Moisture vapor emission and moisture content testing shall conform with the requirements of ASTM F 1869-98 (Calcium Chloride Test) and ASTM F 2170-02 (Relative Humidity Probe Test). If test results show excessive levels of moisture content or vapor emission rate above that recommended by the manufacturer, apply manufacturer's recommended moisture vapor emission control material.

\*\* NOTE TO SPECIFIER \*\* Consider specifying a 15 mil or 20 mil reinforced puncture resistant vapor barrier.

* + - 1. Saw cutting of control joints shall be done between 12 and 24 hours after placement of the structural concrete.
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
		3. Cast-in-Place Concrete:
			1. Shotblast or rough grind area to receive terrazzo according to manufacturer's recommendations.

\*\* NOTE TO SPECIFIER \*\* Cracks in substrate will usually be transmitted through topping to surface. Flexible membrane over cracks can be used to minimize chance of sub floor cracks transferring to the terrazzo surface. A crack isolation membrane over the entire surface (step #3) is an alternative. Delete method not required.

* + - 1. Refer to NTMA Technical Bulletin #111 or NTMA.com "Crack Detailing and Joint Treatments for Thin Set Terrazzo". Route out all cracks larger than 1/32 inch (0.8 mm) width and fill with rigid epoxy such as Key #502 or similar. Apply Key #580 Flexible Epoxy across the crack a minimum width of 24 inches (610 mm) at a spread rate of 50 square feet (4.6 square meters) per gallon to achieve 32 mils (.8128 mm) dry over the crack and allow to cure. Apply Key #502 Primer to cured membrane. Imbed fiberglass mesh into wet primer and saturate with additional Key #502 Primer. Alternate method: Lightly place scrim cloth onto surface of tacky Key #580, do not imbed full depth in resin.
			2. Apply Key #580 Flexible Epoxy over entire floor surface as a crack isolation membrane if cracks are numerous.
			3. Install divider strips directly above control joints, cold joints and expansion joints in sub floor.
			4. Install divider strips as shown on drawings.
	1. INSTALLATION
		1. Install in accordance with manufacturer's instructions.
		2. Locate all flexible joints required.
		3. Provide accessories necessary for complete installation.
		4. Backing for epoxy terrazzo base shall be a cement board or exterior grade plywood, concrete block, concrete or cement plaster.
		5. Sufficient water, temporary heat, light and adequate electrical power with suitable outlets connected and distributed for use within 100 feet (30 m) of any working space.
		6. Placing Terrazzo:
			1. Prime subfloor in accordance with resin manufacturer's instructions.
			2. Place terrazzo mixture and trowel to a dense flat surface to top of divider strips.
		7. Finishing:
			1. Rough Grinding:
				1. Grind with 24 or finer grit stones or with comparable diamond plates.
				2. Follow initial grind with 80 or finer grit stones.
			2. Grouting:
				1. Cleanse floor with clean water and rinse.
				2. Remove excess rinse water, dry, and apply epoxy grout, supplied by epoxy manufacturer, to fill voids.
			3. Cure Grout.

\*\* NOTE TO SPECIFIER \*\* Grout may be left on terrazzo until all heavy and messy work in project is completed.

* + - 1. Fine Grinding:

\*\* NOTE TO SPECIFIER \*\* Certain terrazzo colors may require grinding to 120 grit, 220 grit or finer to match samples. Specify a finer grit level of grinding if required.

* + - * 1. Grind with 80 or finer grit stones until all grout is removed from surface.
				2. Upon completion, terrazzo shall show a minimum of 70 percent marble chips.
	1. CLEANING AND SEALING
		1. Wash all surfaces with a neutral cleaner.
		2. Rinse with clean water and allow surface to dry.
		3. Apply sealer in accordance with manufacturer's directions.

\*\* NOTE TO SPECIFIER \*\* Certain terrazzo colors may require a solvent based acrylic sealer to reveal a deep luster color. If a low VOC water based acrylic sealer is required, a lower luster finish will result.

* 1. PROTECTION
		1. Upon completion, the work shall be ready for final inspection and acceptance by the owner or his agent.
	2. PROTECTION
		1. The Contractor shall protect the finished floor from the time that the terrazzo installer completes the work.
		2. Protect installed products until completion of project.
		3. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION