KEY RESIN COMPANY

Installation Instructions

KEY CONDUCTIVE EPOXY
KEY CONDUCTIVE NOVOLAC EPOXY

I. GENERAL INFORMATION

KEY CONDUCTIVE EPOXY consists of 100% solids epoxy, carbon fibers, and fillers to produce a fluid mixture that is spread with a V-notched trowel, flat trowel or squeegee. Applied in two coats, **KEY CONDUCTIVE EPOXY** produces a 1/16 to 1/8 inch conductive floor. A 1/4 inch conductive surfacing can be achieved with additional applications. **KEY CONDUCTIVE NOVOLAC EPOXY** is a high chemical resistance formulation that follows the same mixing and installation instructions. If a textured finish is desired, consult with Key Resin Technical Service on the proper use of Key Non-Skid Additive (Coarse Mesh size) and refer to alternate guideline system requirements in section III.

II. SURFACE PREPARATION

Surface Preparation is the most critical portion of any successful resinous flooring system application. All substrates must be properly prepared and tested for moisture vapor emissions as outlined in **KEY RESIN COMPANY'S TECHNICAL BULLETIN #1.** If moisture testing confirms excessive levels of moisture, apply moisture control system Key Epocon SL. Specific attention should be paid to the following:

A. Concrete placement
B. Curing and finishing techniques of the concrete substrate
C. Age of concrete
D. Previous contamination of the substrate
E. Present condition of the substrate
F. Moisture content and moisture vapor emission rate of concrete slab

Also, the temperature and humidity conditions of the area to receive the flooring system should be checked. An optimum room temperature of 75ºF with a minimum slab temperature of 60ºF is required for proper cure of the resin flooring system.

III. MATERIAL QUANTITIES

A. Guideline System Requirements for 1000 ft²

Key Conductive Epoxy	*Qty./1000 ft² at 65 mils*
1. *Key #502* Primer/Low Modulus Binder	4 gallons
2. *Key Conductive Epoxy* (1st coat)	20 gallons
3. *Key Conductive Epoxy* (2nd coat)	20 gallons

Key Conductive Epoxy + Non-Skid Additive	*Qty./1000 ft² at 80-90 mils*
1. *Key #502* Primer/Low Modulus Binder	4 gallons
2. *Key Conductive Epoxy* (1st coat)	20 gallons
3. *Key Conductive Epoxy* (2nd coat)	33 gallons
4. *Key Non-Skid Additive* (Coarse Mesh size, 24 grit)	11 gallons

Note: Key #555 Primer may be substituted for steps #1 and #2 above if solvent odor and VOC content is acceptable for your specific project.

IV. INSTALLATION

A. Priming

Key Resin Company recommends that every flooring system be installed with a primer to insure maximum adhesion to the prepared substrate. Priming will also help to seal air in the concrete and prevent outgassing and air bubbling in the finished system. Use **Key Epocon SL** if moisture vapor emission rate or moisture content exceeds recommended maximums.

1. Mixing ***Key #502*** **Low Modulus Epoxy Primer**
   a. Stir each component prior to mixing.
   b. Mix two (2) parts by volume of Part A (Base) with one (1) part by volume of Part B (Hardener) for three minutes with a low speed electric drill mixing paddle.
   c. If thinning is desired, add no more than one pint of xylene per gallon of epoxy at time of mixing.
   d. ***Do not mix more material than can be immediately poured out and spread/backrolled in 40 minutes. Do not leave mixed material in the pail for longer than 5-10 minutes or working time will be significantly reduced!***
2. Application
   a. Pour primer onto the prepared concrete.
   b. Spread with either a flat trowel or squeegee to a coverage of 250 ft² per gallon.
   c. Back roll with a short nap roller.
3. Allow Primer to sit for 30 minutes. Conductive slurry may be applied to tacky primer for up to five (5) hours after primer application. If primer is to be allowed to sit for prolonged periods (maximum 24 hour recoat time), broadcast lightly with dry silica sand.

B. First Coat (Basecoat): Key Conductive Epoxy Flooring

1. Mixing ***Key Conductive Epoxy (or Key Conductive Novolac)***
   a. Stir each component prior to mixing.
   b. Mix two (2) parts by volume of Part A (Base) with one (1) part by volume of Part B (Hardener) for three minutes with a low speed electric drill mixing paddle. Continue mixing until thoroughly blended.
   c. ***Mix only that amount of material that can be immediately poured out in ribbons and spread/backrolled in 30-40 minutes.***

Note: ***Use a slow speed drill to mix*** **Key Conductive Epoxy.** ***Mixing at high speeds can break up conductive fibers. Damaging the carbon fibers will reduce the conductivity of the system.***

2. Application
   a. Immediately after mixing pour mixed material onto floor in a strip and spread at a rate of 45-50 ft²/gallon. Apply as a flow coat with a conventional cement finishing trowel, squeegee or gauge rake. Trowel or spread material pulling the material toward you in a "figure-8" pattern to achieve a smooth flow coat of material approximately 30-35 mils thick. Leave a "wet line" or puddle of material between batches to avoid "knit-lines" in the finished system. Fibers must not clump but should be evenly distributed throughout the coating film.

b. Lightly back-roll surface with a short nap roller (pre-wet with mixed resin) if needed to even out trowel or squeegee marks, while material is still wet, pulling the roller ***very lightly*** across the surface. To minimize marks in finished system, the contractor should wear "spiked" shoes while walking on wet material.

Note: Termination points at the end of the day should be made at doorways, expansion joints, etc. If it is not possible to terminate at these points, 2" masking tape should be placed in a straight line at the ending point. Carefully trowel the material up to and slightly over the inside edge of the tape. Allow material to cure for about thirty (30) minutes and remove the tape.

c. Allow floor to cure overnight or a minimum of 12 hours.

C. Second Coat (Topcoat): Key Conductive Epoxy Flooring

Note: If installing 80-90 mil textured system, see references below.

Important: *Before application of second coat, test first coat of Key Conductive Epoxy in random locations to confirm readings of 25,000 to 1,000,000 ohms. Consult with Key Resin Technical Service if any areas do not test properly.*

Note: If installing conductive copper tape or grounding plates to connect with building ground points, this should be done over the cured basecoat (first coat) prior to final topcoat. See section F for details.

1. Mix ***Key Conductive Epoxy*** as outlined in First Coat, section B. ***Textured System:*** After mixing Key Conductive Epoxy for about 2-3 minutes, continue mixing and add by volume 1 part Key Non-Skid Additive (coarse mesh) to 3 parts mixed epoxy.

Note: Use a slow speed drill to mix **Key Conductive Epoxy.** ***Mixing at high speeds can break up conductive fibers. Damaging the carbon fibers will damage the conductivity of the system.***

2. Application: Apply as outlined in First Coat, section B. ***Textured System:*** Immediately pour resin in ribbons and flat trowel at 30 ft²/gallon.

D. Curing

1. Finished thickness of ***Key Conductive Epoxy Flooring System*** is approximately 65 mils, or 80-90 mils for textured system. If a thicker system is required, build thickness using alternative materials recommended by Key Resin Company prior to application of ***Key Conductive Epoxy***.
2. Do not open to light traffic for 48 hours at 70 degrees F. Full chemical cure and maximum chemical resistance is achieved in 5 to 7 days at 70 degrees F.
3. After 24 hour cure of topcoat, test floor with floor surface ohm meter, confirm that conductivity meets requirements. Flooring contractor or facility owner is responsible for testing floor.

E. Cove Base

Refer to Key Cove Base Installation Instructions, Section IV, Key Mortar Cove Base. Key Conductive Epoxy topcoats must be applied no thicker than 12-15 mils (100-125 ft² per gallon) per coat to avoid runs/sags.

F. Testing

1. Testing should be performed to confirm proper conductivity range before demobilizing. The floor system may test in proper conductive range after 24 hours of cure time, but note that final conductivity readings may require 72 hours cure time at 70-75 degrees F.
2. Flooring contractor or owner's agent is responsible for testing floor.

3. Test multiple random areas to confirm a conductivity range of 25,000 to 1,000,000 ohms. Consult with Key Resin Technical Service if any areas do not test properly.

G. Installation of Copper Grounding Tape, Grounding Plates, and Connection to the Building's Earth Ground Points

Note: May be optional depending on project and/or building owner's requirements

A high degree of conductive control can be achieved without direct connection to an earth grounding point or AC equipment grounding point, particularly for floor installations bonded directly to concrete. However, building owners, project specifications or critical applications may dictate that the conductive flooring be applied in direct uninterrupted contact with properly prepared grounding points, using copper tape, metal plates and/or wire. Key Resin defers to the building owner to confirm their own unique requirements and make the final decision on whether or not connecting the conductive floor finish to specific earth ground points, AC equipment ground points, or auxiliary ground points are required. Be aware that additional Conductive/ESD control measures may be required such as ESD footwear, personnel grounding straps, electrically grounded work stations, etc. Refer to the appropriate ANSI/ESD standards, available for purchase from the Electrostatic Discharge Association at www.esda.org.

Metal floor joints, metal equipment bases and steel columns/posts may be used for earth grounding points if they have been electrically tested to confirm permanent continuity with an earth ground. This should be confirmed by the building owner's electrician. Unless otherwise specified, a general rule of thumb is one grounding point for every 1000 square feet of flooring in rooms larger than 1000 square feet, or two grounding points in rooms smaller than 1000 square feet. Metal structures used as grounding points must be cleaned, sanded or lightly abraded with a grinder to remove all insulative coatings, rust and dirt. Approximately 1/4" height by 3" width of surface preparation will be necessary to create a grounding point.

Copper tape with conductive adhesive can be used to connect the flooring system to grounding points, bridging over exposed joints around columns or connecting different concrete slabs separated by exposed joints. Copper tape may not maintain long-term integrity over expansion joints that experience significant movement. Suppliers of copper tape and/or grounding plates: McMaster-Carr (www.mcmaster.com, part #76555A642 for ½" width tape, or available from Key Resin as special order), Ground Zero Electrostatics (www.gndzero.com) for various sizes of tape, grounding plates and lead wires.

1. A minimum 4" length of copper tape is adhered onto the surface of the cured Key Conductive Epoxy basecoat, prior to topcoat installation, with the remainder length allowed to run up the wall to an electrical outlet where it can be attached by an electrician. The connection is made to the green wire or grounding portion of the electrical outlet. For metal structures such as columns, attach tape to prepared surface by drilling hole into steel and securing tape with machine screw and washer.

2. Alternate method using copper or other conductive metal plate: In addition to installing copper tape as outlined above, adhere plate to surface of cured Key Conductive Epoxy topcoat. Use plate with conductive adhesive backing. Attach copper wire (#10 or #12 gauge) to plate and electrical outlet ground or secure to hole in steel structure with machine screw and washer. Plates purchased from Ground Zero have lead wires attached to plate. L-angle conductive metal plates may also be bonded to the Key Conductive Epoxy basecoat using conductive adhesive. The Key Conductive Epoxy topcoat is applied over the metal plate.

3. Alternate method for attaching to ground point inside drywall: Connect #10 or #12 wire from any convenient ground point and drop down to floor/wall junction, with wire brought underneath wall via a small hole cut into drywall or chip out hole in concrete floor. The copper wire is intertwined or soldered to the copper tape or plate. If using tape, it can be pushed into the wall.