



# Installation Instructions

## KEY #520 ESD Coating System (12-15 mils)

KEY #502 Epoxy Primer

KEY #520-ESD/Conductive Epoxy

### I. GENERAL INFORMATION

**KEY #520 ESD Coating System** consists of Key #502 Epoxy Primer followed with one finish coat of Key #520-ESD/Conductive Epoxy Coating. Key #520-ESD/Conductive is available in pigmented finish only. **KEY #520 ESD Coating System** will test in the “ESD” range, between 1,000,000 and 1,000,000,000 ohms electrical resistance when Key #520-ESD/Conductive is applied over a non-conductive primer (or non-conductive bodycoat), and produces a 12-15 mil thick ESD floor coating system. Important Note: Key #520-ESD/Conductive when applied over a *conductive* primer or conductive basecoat will test in the “conductive” range, between 25,000 and 1,000,000 ohms electrical resistance. Refer to **KEY #520 Conductive Coating System** for further details. A thicker system of 20-30 mils or greater can be achieved by adding a non-conductive bodycoat, contact Key Resin for details.

### II. SURFACE PREPARATION

**Surface Preparation** is the most critical portion of any successful resinous flooring system application. All substrates must be properly prepared to a minimum surface profile of CSP-2 as outlined in **KEY RESIN COMPANY'S TECHNICAL BULLETIN #1**. Specific attention should be paid to the following:

- A. Concrete Placement--An efficient vapor barrier should be under slabs on or below grade to prevent moisture migration. A moisture vapor treatment may be necessary.
- 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

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

### III. MATERIAL QUANTITIES

#### A. Guideline System Requirements for 1000 ft<sup>2</sup>      12-15 Mils

	<i>Qty./ 1000 ft<sup>2</sup></i>
1. Key #502 Epoxy Primer	4-5 gallons
2. Key #520-ESD/Conductive Epoxy	5-6 gallons**

***Important:*** Do not apply **Key #520 ESD/Conductive** greater than 12 mils total thickness (in one coat) or conductivity will decrease, possibly resulting in a zero conductivity finish. This would then require a reapplication of Key #520-ESD/Conductive.

**\*\*Note:** If specifications or facility requirements dictate the use of grounding tape, this must be placed between two coats of **Key #520 ESD/Conductive**, or grounding plates must be adhered to the surface of the final topcoat. Refer to section IV-D.

## IV. INSTALLATION

### A. Key #502 Epoxy Primer

1. Mixing
  - a. Stir each component prior to mixing.
  - b. Mix two (2) parts by volume of Part A (Resin) 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 or MEK per gallon of epoxy at time of mixing.
  - d. ***Do not mix more material than can be immediately poured out and spread/backrolled in 30-40 minutes. Do not leave mixed material in the pail for longer than 5 minutes or working time will be significantly reduced!***
2. Application
  - a. Pour mixed resin onto the prepared concrete.
  - b. Spread with either a flat trowel or squeegee to a coverage of 200 to 275 ft<sup>2</sup> per gallon.
  - c. Back roll with a short nap roller.
  - d. Allow primer to cure 8-12 hours (at 75 degrees F) prior to topcoating. A fast cure formulation is available to reduce re-coat window to 4-6 hours. If primer is to be allowed to sit for longer than 24 hours, sand primer before topcoating.

### B. Key #520-ESD/Conductive Topcoat

Note: This system must be applied with a smooth finish texture or very minimal texture to ensure proper contact of the test apparatus with the surface of the coating. **IMPORTANT: Do not apply Key #520-ESD/Conductive greater than 12 mils total thickness (in one coat) or conductivity will decrease, possibly resulting in a zero conductivity finish. This would then require a reapplication of Key #520-ESD/Conductive.**

1. Mixing **Key #520-ESD/Conductive**
  - a. Stir each component prior to mixing.
  - b. Mix three (3) 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. ***Mix only the amount of material that can be immediately poured out.***
2. Application
  - a. Immediately pour mixed material onto floor in strips and spread at a rate of 160-200 ft<sup>2</sup> per gallon with a squeegee.
  - b. Back roll immediately with a short to medium nap roller. Do not backroll excessively.
3. Allow to cure overnight or a minimum of 12 to 16 hours at 75 degrees F.
4. Do not open to light foot traffic for 24 hours, light to medium duty wheeled traffic for 48-72 hours at 75 degrees F. Full chemical cure is achieved in 5 to 7 days at 75 degrees F.

5. After 72 hour cures of topcoat, test floor with floor surface ohm meter, confirm that conductivity meets requirements. Flooring contractor or owner's agent is responsible for testing floor. Final conductivity testing requires 72 hours cure time to obtain final readings. Testing performed prior to 72 hours cure time will initially yield higher test results (higher ohms), which will decrease as cure time progresses to 72 hours.

### **C. Testing**

1. Testing should be performed after 72 hours to confirm proper conductivity range.
2. Test multiple random areas to confirm a conductivity range of 1,000,000 to 1,000,000,000 ohms. Consult with Key Resin Technical Service if any areas do not test properly.

### **D. Installation of Grounding Tape, Grounding Plates and Connection to Building Ground Points**

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

A high degree of ESD control can be achieved without direct connection to an earth grounding point, particularly for floor installations bonded directly to concrete. However, building owners, project specifications or critical applications may dictate that the ESD flooring be connected to properly prepared grounding points using copper tape, plates and/or wire. Metal floor joints, metal equipment bases and steel columns/posts may be used 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 per every 1000 square feet of flooring. 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](http://www.mcmaster.com), part #76555A642 for 1/2" width tape, or available from Key Resin as special order), Ground Zero Electrostatics ([www.gndzero.com](http://www.gndzero.com)) for various sizes of tape, grounding plates and lead wires.

1. A minimum 4" length of copper tape is adhered between two coats of Key #520 ESD/Conductive, prior to final 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 #520 ESD/Conductive 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.
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.