EPOXY FLOORING SYSTEM FOR – ESD-CONTROLLED CLEANROOM ENVIRONMENTS

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Introduction

Cleanroom environments demand **extremely precise electrostatic discharge (ESD) control** to protect sensitive equipment, maintain contamination-free conditions, and ensure uninterrupted performance of precision operations. Even a minor electrostatic imbalance can result in **component failure, data corruption, or product rejection.**
The **Epoxy Flooring System for ESD-Controlled Cleanroom Environments** by **Ressichem** provides a **highly conductive, seamless, and durable epoxy floor system** specifically engineered for cleanroom-grade environments. It ensures **controlled and uniform** static dissipation, in coordination with grounding networks, while maintaining a smooth, hygienic, and low-particle-emitting surface.

Recommended Use Cases

- Semiconductor and microchip manufacturing
- Pharmaceutical cleanrooms
- Medical device production facilities
- Precision laboratories and calibration zones
- Aerospace and defense electronics assembly
- Research & development centers with controlled ESD

Step-Wise System Description

Step 1: Surface Preparation

Proper substrate evaluation and preparation are critical to ensure uniform grounding and long-term ESD performance.
All necessary surface repairs, including crack filling or substrate restoration, must be completed prior to the application of any epoxy flooring materials.
- The **concrete strength** requirement must be defined by the project consultant as per the operational load profile.
- Perform both **destructive (core sample)** and **non-destructive (Schmidt Hammer)** strength testing to verify substrate integrity.
- For **major repairs** (≥ **12 mm**), apply **Ressi NSG 710**, a high-strength, non-shrink cementitious repair mortar.
- For minor imperfections, use Ressi EPO Primer LV blended with **Ressichem's washed, graded, and completely dried silica sand** to form a moisture-free repair paste.
- Mechanically prepare the substrate through **shot blasting or diamond grinding** to ensure an oil-free, dust-free surface.
- In previously used floors, ensure full removal of oil or grease contamination before application.

Step 2: Application of Ressi SLS Primer – 1 and Ressi SLS 610 (If Required)

If leveling is required to achieve a uniform substrate before epoxy application, apply **Ressi SLS Primer – 1** followed by Ressi **SLS 610, a self-leveling cementitious floor screed.**
Allow **7–14 days** for the screed to release moisture depending on ambient temperature and humidity before proceeding with epoxy installation. Ensure **moisture level < 5%** before further coating.

Step 3: Application of Ressi EPO Primer LV and Copper Strip Installation

Apply **Ressi EPO Primer LV**, a **low-viscosity, solvent-free epoxy primer** that promotes bonding and surface sealing. During this stage, the **copper grounding network** is integrated into the flooring system.
- Copper strips are **bonded using Ressi EPO Primer LV** over the prepared surface.
- The **spacing, width, and thickness** of the copper strips are to be determined according to the client's ESD requirement.
- Once installed, the **continuity and discharge capacity** of the grounding system should be tested and verified before applying the conductive topcoat.
- This ensures that the entire copper grid forms a consistent and functional discharge path across the floor area.

Step 4: Application of Ressi EPO Anti-Static

Apply **Ressi EPO Anti-Static,** a **conductive epoxy topcoat** that ensures seamless conductivity across the surface and effective connection to the copper grounding system.
- Apply the material at a **minimum thickness of 1000 microns above the height of the copper strip layout.**
  o For example: if the copper strip thickness is **1000 microns**, the total topcoat thickness should be **2000 microns**, ensuring the conductive layer adequately covers and protects the strips.
- Apply using a **notched trowel or epoxy squeegee**, followed by back rolling to achieve a uniform finish.
- Allow the coating to **fully cure** before conducting ESD validation.

Step 5: Floor Markings (If Required)

For cleanroom demarcations, apply **Ressi EPO Anti-Static** in a **contrasting color** using a roller at a thin coat thickness.
This ensures that the visual layout complements the conductive flooring while maintaining its electrical continuity.
detailed product guidelines and curing information.

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System Advantages

- **Seamless ESD Control:** Maintains consistent conductivity across the entire cleanroom floor area.
- **High Cleanroom Compatibility:** Smooth, dust-free, and low-particulate surface.
- **Chemical Resistance:** Withstands common cleaning and sterilization agents.
- **Durability:** Designed for heavy-duty cleanroom equipment and wheeled traffic.
- **Hygienic Surface:** Non-porous and easy to clean, maintaining GMP compliance.
- **Grounded Safety:** Provides reliable discharge pathways via copper strip integration.
- **Customizable Finish:** Available in cleanroom-appropriate colors and gloss levels.

Maintenance Guidelines

- Use only neutral pH cleaners to maintain coating integrity and conductivity.
- Avoid applying insulating waxes or sealers over the ESD surface.
- Inspect grounding points periodically for continuity.
- Periodic re-coating may be required to restore finish and maintain ESD consistency.
- Keep the cleanroom climate controlled to ensure consistent ESD performance.

System Summary Table

Parameter	Description
System Name	Epoxy Flooring System for – ESD-Controlled Cleanroom Environments
Area Type	Specialized / High-Performance – Cleanroom & ESD-Controlled Facilities
Traffic Exposure	Light to Heavy (as per cleanroom equipment)
Primary Requirements	Controlled ESD Discharge and Grounding Integration
Primer (Optional)	Ressi SLS Primer – 1 (for SLS systems)
Leveling Layer (Compulsory)	Ressi SLS 610 (if required)
Epoxy Primer	Ressi EPO Primer LV (used for both priming and copper bonding)
Conductive Layer	Ressi EPO Anti-Static (≥ 1000 microns above copper layout)
Silica Used	Washed, graded, and completely dried (zero moisture content) silica sand
Copper Grid Network	Installed and grounded as per site-specific ESD requirements
Application Method	High-Build Trowel or Epoxy Squeegee
Finish Type	Smooth, Low-Gloss / Semi-Gloss Conductive Finish
Curing Time Before Use	48–72 Hours (Light Access) / 7 Days (Full Cure)
Key Benefits	ESD Control, Durability, GMP Hygiene, Grounding Integration

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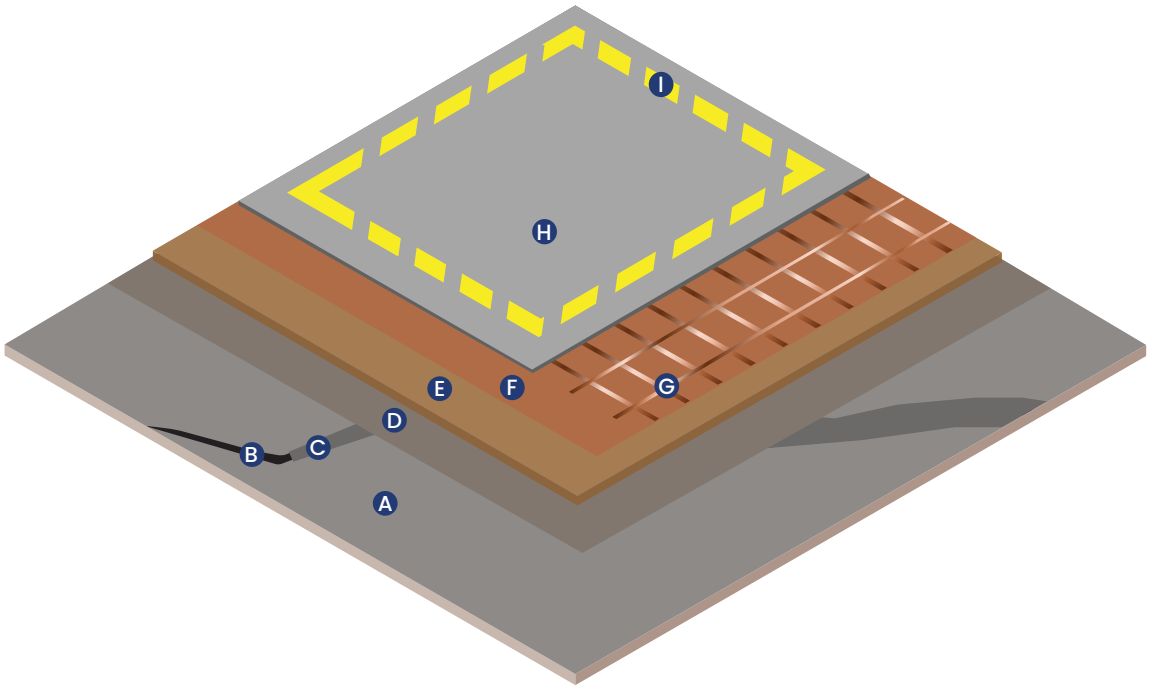
Conclusion

The **Epoxy Flooring System for ESD-Controlled Cleanroom Environments** by **Ressichem** is a **precision-engineered conductive epoxy system** that integrates copper grounding with anti-static technology for complete electrostatic discharge management.
The combination of **Ressi EPO Primer LV, embedded copper grid,** and **Ressi EPO Anti-Static** creates a robust, hygienic, and reliable flooring solution tailored for **pharmaceutical, semiconductor, and medical cleanroom environments.**

System Summary



A) Cementitious Surface: (Concrete slab or screed)
B) Cracks and surface damage
C) Crack Filler and Repairing Materials
D) Ressi SLS Primer – 1
E) Ressi SLS 610
F) Ressi EPO Primer LV
G) Copper Strips
H) Ressi EPO Anti-Static
I) Ressi EPO Anti-Static (Marking)

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