



## ESD CONTROL FLOORING SYSTEMS

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## Flooring Systems for ESD Protected Areas (EPAs)

### Selecting a Flooring System

Electronic components become more sensitive to ESD as device density increases and circuit geometry shrinks. This trend will continue as new micro-chip technologies are introduced. Providing effective protection into the future is an important consideration in the design of an **ESD Protected Area**.

ESD control flooring systems can have a useful life in excess of 10 years. Selecting a material with stable and predictable long-term characteristics is essential. Protection for the next generation of electronic devices is ensured by choosing a material that controls body voltage to low levels.

### BS EN 61340-5-1:2007 – Protection of Electronic Devices from Electrostatic Phenomena

This is the current ESD protection standard and sets out the technical performance requirements for flooring systems.

### Key Performance Requirements for Floors used for Grounding Personnel

To comply with the standard, one of the following performance qualifications apply:-

- Resistance to ground ( $R_g$ ) of the person/footwear/floor combination  $< 3.5 \times 10^7 \Omega$  or...
- The resistance to ground of the person/footwear/flooring system  $< 1 \times 10^9 \Omega$  and body voltage is maintained at  $< 100V$

A floor that meets the above criteria allows the movement of ESD-sensitive items within the area without additional protection.

### Key Performance Requirements for Floors not used for Grounding Personnel

- Resistance to the groundable point ( $R_{gp}$ )  $< 1.0 \times 10^9 \Omega$

ESD-sensitive items will require additional protection when moved within the area.



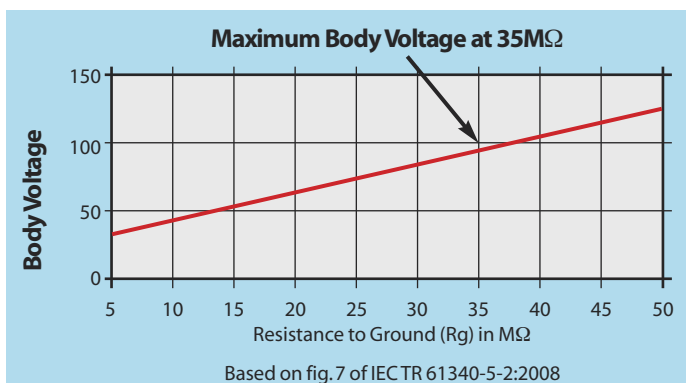
### Safety Considerations for Flooring Installations

Personnel safety is the first consideration when selecting items for use in an EPA. BS EN 61340-5-1:2007 contains 2 clauses relating to safety.

- Clause 4.0 states 'electrical hazard reduction practices should be exercised.'
- Clause 5.3 states 'Some of the elements listed in Tables 1-4 do not have a defined lower resistance limit. However, a minimum resistance value may be required for safety reasons.'

Personnel may be exposed to a situation where they are grounded, simultaneously, through several elements in the EPA. These could include footwear, wrist strap, seating and the floor. In the event of an electric shock at mains voltage, the combination of the parallel paths through all the elements may expose the person to significant risk of harm. Selecting a floor material that provides  $R_g > 1 \times 10^6 \Omega$  is, by far, the lowest risk strategy. With a floor  $R_g$  above this level, even when low resistance footwear and/or seating are in use, electric shock current will be limited to a safe level.

SSE recommend that flooring within an EPA is chosen to maintain safe working conditions at all times, without having to rely on specially selected footwear and/or seating; the characteristics of these items can be highly variable. By adopting the safety criteria used for wrist straps, equivalent to the  $1M\Omega$  resistor in the cord, the floor system will be safe at all times.



This graph illustrates the relationship between body voltage and resistance to ground ( $R_g$ ). At  $35M\Omega$ , body voltage will be maintained at  $< 100V$ , complying with the requirements of BS EN 61340-5-1:2007.

# NeoStat RX Static Dissipative Flooring

A range of specialised floor coverings for use in the electronic industry or any area that required permanent control of undesirable electrostatic charges.

NeoStat RX is the ideal flooring for direct grounding of personnel and equipment, controlling body voltage to <10V.

We recommend that:-

- All materials are fitted by qualified installers to ensure that the correct performance is achieved.
- A survey is carried out to evaluate site conditions and advise on any necessary preparatory work.

SSE PROVIDE A FULL INSTALLATION, TESTING AND CERTIFICATION SERVICE

NeoStat RX is a homogenous flexible synthetic rubber with a range of patterns normally laid on conductive adhesive with copper foil earthing strips. This material has excellent chemical, solvent and heat resistant properties. Suitable for primary grounding of personnel and equipment.

**Applications:**

- electronic production areas
- service and repair areas
- electronic storage areas
- R & D laboratories
- access flooring
- telephone exchanges
- chemical handling areas

The use of rubber based floor coverings has the following advantages:

- superior chemical and heat resistance compared with vinyls
- high wear resistance
- low maintenance costs
- environmentally friendly
- no acidic fumes or dioxins when exposed to flame



## Performance Details

Features	Fleck, Deco, Chip and Speck Patterns	Dot Pattern
Personal Safety (protection from electric shock) <sup>(1)</sup>	Rg >7.5x10 <sup>5</sup> Ω	Rg >5x10 <sup>5</sup> Ω
Protection for 100V device sensitivity (person to ground maximum resistance) <sup>(2)</sup>	Rg <3.5x10 <sup>7</sup> Ω	Rg <1x10 <sup>6</sup> Ω
Floor Surface to Ground resistance (typical average)	Rg ≈2.5x10 <sup>7</sup> Ω (Tested at 100V)	Rg ≈3x10 <sup>6</sup> Ω
Resistance to hot objects (solder, dropped soldering irons)	Excellent	
Long Term Durability	Excellent	
Chemical Resistance	Excellent	
Maintenance	Non-porous surface facilitates cleaning. Scuff marks can be removed without the use of abrasive pads.	
Material Disposal	End of life disposal or recycling is environmentally safe.	
Performance in Fire	Does not release corrosive fumes, dioxins and heavy metals.	
Guarantee of physical performance	10 Years	
Guarantee of ESD performance	10 Years	

**Note <sup>(1)</sup>**

This requirement is equivalent to the 1MΩ safety resistor in wrist strap leads. It is therefore important that this is an inherent property of the floor material, to avoid risks with low resistance footwear or heel straps (or even damp shoes). The value is appropriate for mains voltages of 240V.

**Note <sup>(2)</sup>**

BS EN 61340-5 Part 1 and 2 are based on protection of devices down to an ESD sensitivity of 100V. Although less sensitive devices may be in use, the trend in electronics is to low power and higher component density at chip level; this inevitably increases the susceptibility of device to ESD damage. The 3.5 x 10<sup>7</sup>Ω value is based on research which has shown that above this level, body voltage can exceed the 100V threshold (see BS EN 61340-5 Part 2 – User Guide section 5.2.8 and Figure 101). See graph on page 10.

NeoStat RX rubber based flooring material produces very low levels of body voltage (< 10V) when used in conjunction with an approved foot grounding method.

NeoStat RX rubber is guaranteed for 10 years both for electrostatic and mechanical performance when installed and maintained in accordance with SSE specification.

**SPECIFICATION:**

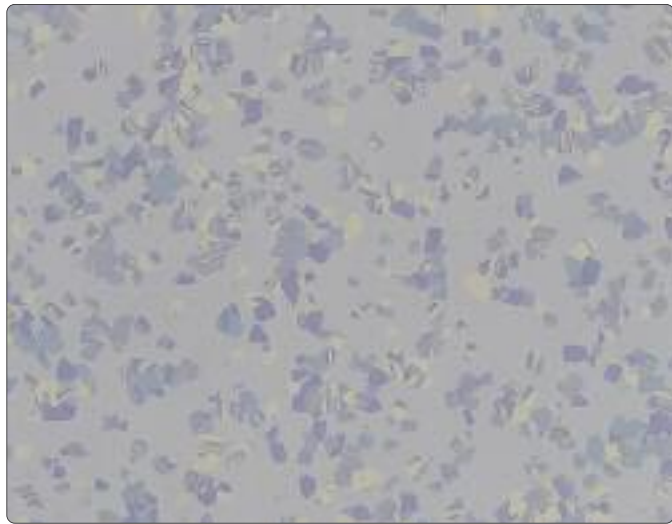
Roll Width 1200mm  
 Roll Length 15m and 8m(3.5mm thick)  
 Tile Sizes 610 x 610mm (15 per carton)  
 Thickness 2mm (3.5mm thick also available in 3 colours)  
 Resistance to Ground (Rg) 10<sup>6</sup> – 10<sup>9</sup>Ω

See pages 12 and 13 for the full range of NeoStat RX colours

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## FLECK COLOURS



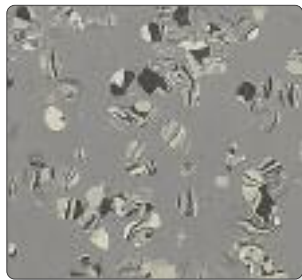
Light Blue Fleck



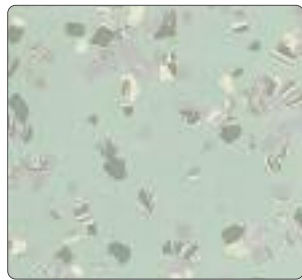
Blue Fleck



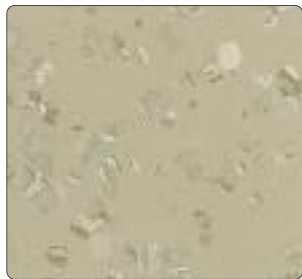
Zircon Fleck



Grey Fleck



Mint Fleck



Beige Fleck



Sand Fleck

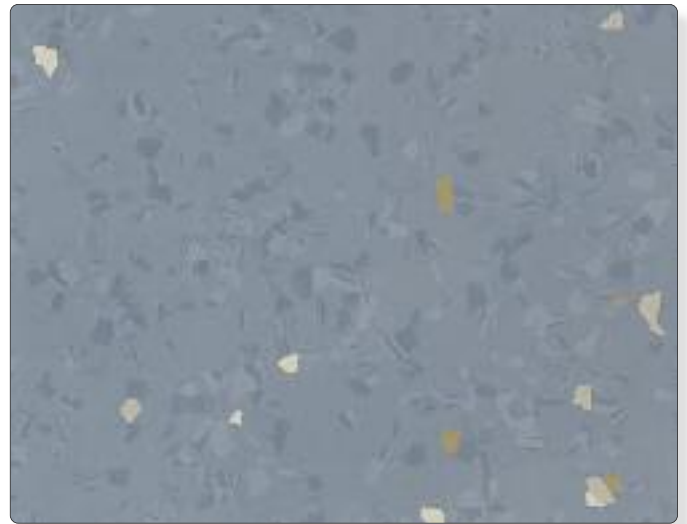


Ivory Blue Fleck



Ivory Vellum Fleck

## DECO COLOURS



Wedgwood Deco



Blue Deco



Pebble Deco



Corvette Deco



Slate Deco



Sage Deco



Aqua Deco



Magnolia Deco

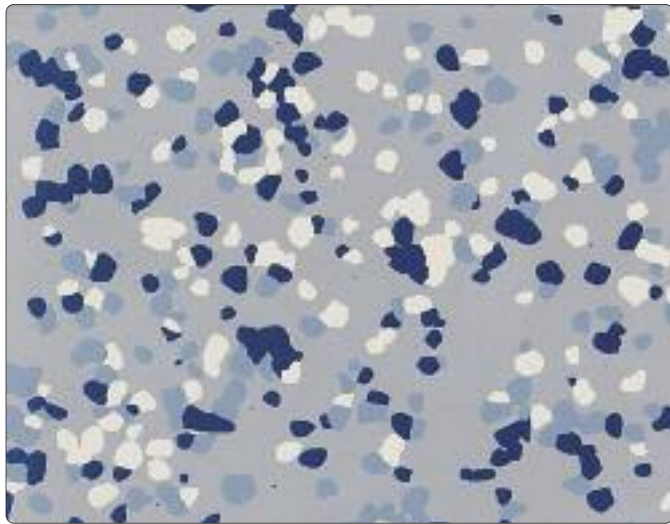


Biscuit Deco

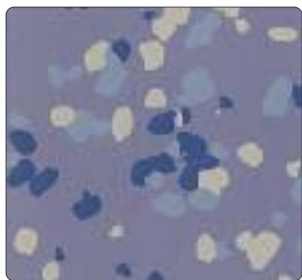
Ivory Fleck colours are in 610 x 610mm tiles only.



CHIP COLOURS



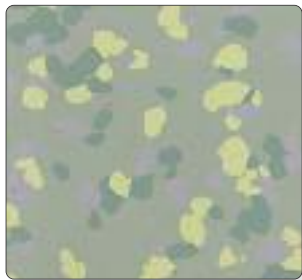
Grey Blue Chip



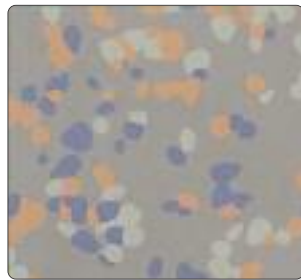
Blue Chip



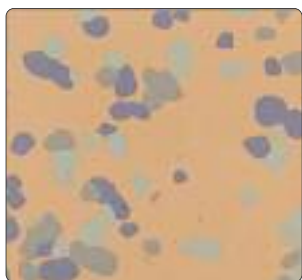
Grey Chip



Green Chip



Bisque Chip



Orange Chip

DOT COLOURS (Explosion Risk Areas)



Blue Dot



Pebble Dot

SPECK COLOURS



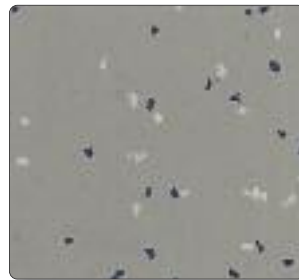
Astral Speck



Platinum Speck



Mauve Speck



Aqua Speck



Grey Speck



Pebble Speck



Lava Dot



Grey Dot





Blue



Sand



Sage

## NeoStat LX Linoleum Flooring

A cost effective alternative to vinyl flooring, NeoStat LX Linoleum provides excellent ESD protection, with very low charge generation, good heat and resistance and ease of cleaning. Manufactured from plant-derived materials and limestone, it is fully bio-degradable, with low-cost end-of-life disposal. 3 STANDARD COLOURS

### Applications:

- Manufacturing areas
- Service and Repair Areas
- R&D laboratories
- Telephone and IT facilities
- Store rooms

### TECHNICAL SPECIFICATION

Roll width:	2000mm
Thickness:	2.5mm
Resistance to ground (Rg):	$10^6 - 10^8\Omega$
Body voltage:	<20V (with suitable ESD footwear).



Grey



Blue



Green



Stone

## NeoStat V-LOK Interlocking Flooring Panels

A system designed to overlay existing floors with minimal preparation. Comprising 610 x 610mm panels and 150mm ramped edge components and corners. Ideal for small to medium sized areas and for short-term temporary installations.

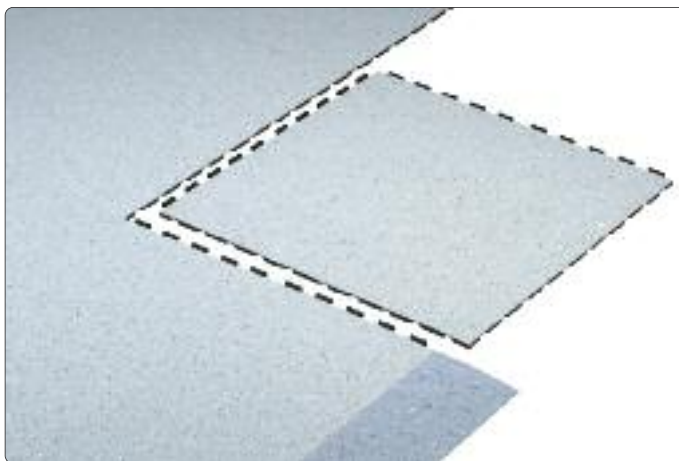
The overall appearance is identical to a normal tiled floor. Available as floor kits for customer installation, or fully installed. Tested and certified by SSE.

### Applications:

- Manufacturing areas
- Service and Repair Areas
- R&D laboratories
- Telephone and IT facilities

### TECHNICAL SPECIFICATION

Panel size:	610 x 610mm
Thickness:	9.7mm
Resistance to ground (Rg):	$10^6 - 10^8\Omega$
Body voltage:	<100V (with suitable ESD footwear).



Royal Blue



Rust



Olive Green



Slate Grey

## NeoStat LPC Loop Pile Carpet Tiles

Attractive loop pile carpet tiles incorporating conductive fibres, with a special backing to provide effective grounding through a brass foil grid. Normally laid on a peelable release adhesive.

Format: TILES

### Applications:

- service and repair areas
- R&D laboratories
- access flooring
- telephone exchanges
- computer rooms
- high-tech offices

### TECHNICAL SPECIFICATION

Tile Size:	500 x 500mm
Thickness:	6mm
Leakage Resistance:	$10^6 - 10^8\Omega$

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