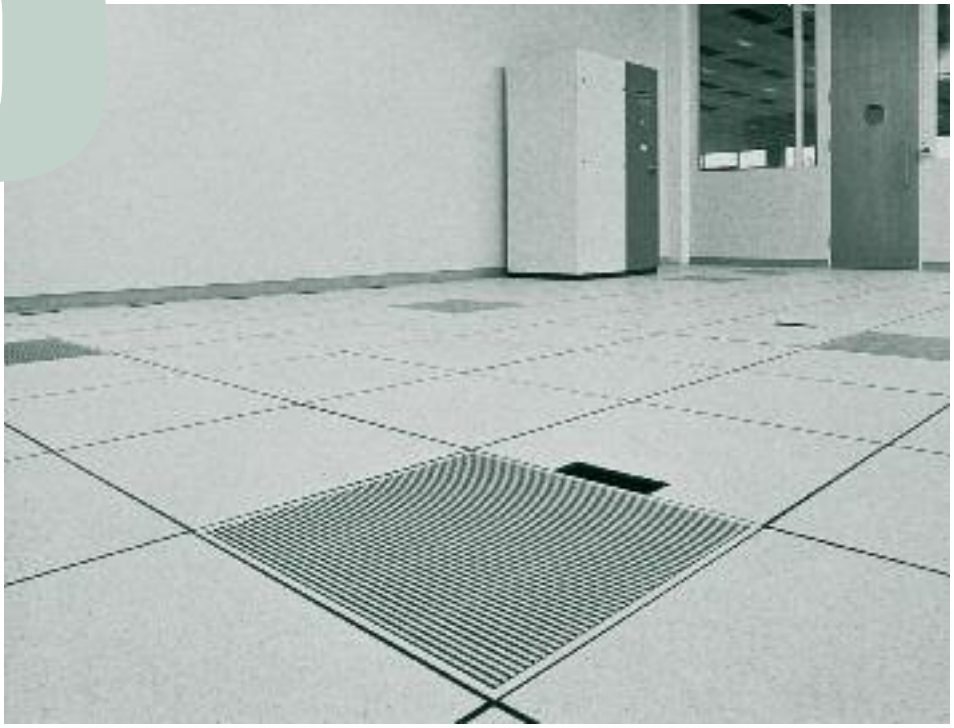
8 Electro Static Dissipative (ESD) floorcoverings



The Polyflor ESD family of vinyl floorcoverings consists of products which are designed to meet specific resistance requirements.
The terminology used to describe the various categories was changed in 1999, as the IEC brought together the various electronics industries to ensure that the same terminology is used by all parties.

Antistatic
These products do not accumulate static charges above 2.0 KV and are classified as 'Antistatic' when tested to EN1815. For specialist application where there is a requirement to dissipate the charge, see Polyflor ESD product ranges.

Static Dissipative (SD)
These products when tested to the test methods identified in our literature have a resistance to earth between 1 x 10^6 and 1 x 10^9 ohms.

Electrostatic Conductive (EC)
These products when tested to the test methods identified in our literature have a resistance to earth between 5 x 10^4 and 1 x 10^6 ohms.

Polyflor Royal Ordnance Factory (ROF)
These products when tested to the test methods identified in our literature have a resistance to earth between zero and 5 x 10^4 ohms.

8.1 SPECIFYING THE CORRECT PRODUCT

The Polyflor ESD family of products is designed to minimise or eliminate the risk of Electro Static Discharge (ESD) and it is essential that the correct product be selected for the intended application. An electrical performance specification must be identified at the outset. This will not only stipulate the maximum and minimum electrical resistance requirements of the installed floor, but will also identify the method of test, the electrodes to be used, the method of measurement and the testing environment.

From this information, the correct Polyflor ESD product can be identified, taking into account both the electrical performance and the method of installation. Whenever specifying a Polyflor ESD vinyl floorcovering, Polyflor strongly recommends that you discuss your requirements with our Customer Technical Services Department. They will advise on which products are best suited for the particular application, and where no specification has been identified, will advise on the specifications used in similar installations/industries.

8.2 ISOLATION OF SUBFLOOR

The electrical conductivity of a solid subfloor can vary greatly, and as a result the installed floor may have resistances lower than the minimum stated in the specification. Cementicious underlayments provide an isolating barrier of known resistance beneath the vinyl floorcovering.

Polyflor recommends that all solid subfloors should be covered with a cementicious underlayment which must be at least 3mm thick. The choice of underlayment is dependent upon the end use location, and consideration should be given to such properties as point load resistance and protein content.
The underlayment should be allowed to dry prior to the application of the floorcovering.

Polyflor accepts no responsibility for non-conformance due to the resistance of the installed floor being below the minimum specified, if an isolating barrier has not been used.

Note: Suspended timber subfloors are not conductive and do not require an isolating barrier.

8.3 CONDUCTIVE ADHESIVES

Polyflor recommends the use of Polyflor conductive adhesive for all Static Control floorcoverings and Polyflor contact adhesive for earthing strips. If alternative adhesives are used, they must be recommended by the adhesive manufacturer and approved by Polyflor.

Note: Access panels vary from manufacturer to manufacturer, both in design, materials used and electrical performance specification. We recommend in these instances that you discuss your individual requirements with your panel supplier or alternatively with our Customer Technical Services Department.

8.4 CONDUCTANCE TO EARTH

Installing an earthing system is a prerequisite for ESD floors. This gives the end user the option to test to earth should there be a requirement at a later stage. Secondly, it improves the conductance of the installed floor to a known earth via a controlled path.

The choice of material used for the earthing

system can be brass, copper or stainless steel and should be nominally 50mm wide and 0.1mm thick. However, the width is only important for the "Conductive" floorcovering.

When an earthing system is installed, Polyflor recommends the use of at least two connections to earth, the second as a security back-up should the first be disconnected or damaged. Connection of the earthing system to the building earth is normally carried out by a qualified electrician and not the flooring contractor.

8.4.1 Polyflor Static Dissipative (SD) Floorcoverings

The earth strip is laid 150mm from one side of the room, in the same direction as the vinyl sheets are to be laid. This strip is connected to a known earth (Figure 22).

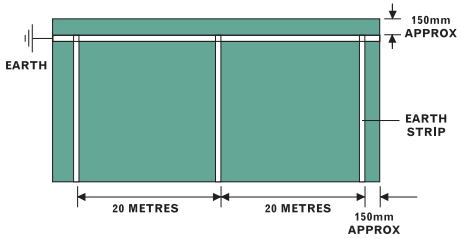


Figure 22 Earthing strip layout

A second strip is laid at 90º to the first, 150mm from the edge and running across the full width of the room. Further strips are laid at 20 metre intervals as determined by the size of the room.

8.4.2 Polyflor Electrostatic Conductive (EC) Floorcoverings

A length of earth strip is adhered to the isolating underlayment and connected to a known earth. The strip need only extend along the floor for 150mm (Figure 23).

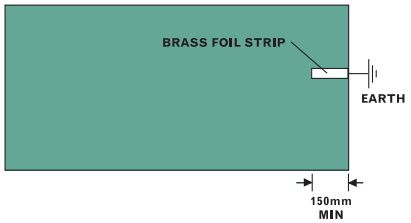


Figure 23 Earth connection

8.4.3 Conductive ROF

With this type of flooring, an earthing grid of the correct size strip (50mm wide, 0.1mm thick) is essential. The strips should be laid to form 600mm^2 grids across the floor, the perimeter strips being 150mm from the wall (Figure 24). At an appropriate point the strip should be connected to a known earth. It is important that the layout of the grid is confirmed with the end user as there are variations in the requirement for some military specifications.

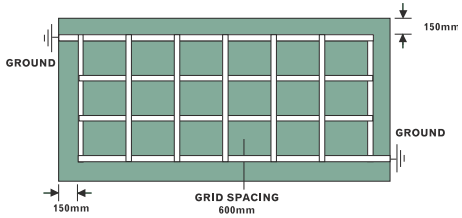


Figure 24 Earthing strip layout

8.5 INSTALLATION METHODS

The basic techniques for installation of Polyflor ESD floorcoverings are the same as described for standard vinyl sheet and tile in Installation of Homogeneous and Safety vinyl sheet and Installation of Homogeneous vinyl tiles. However, there are a number of important differences:

8.5.1 ESD Vinyl Sheet

Polyflor ESD vinyl sheet should be installed by the double drop method. This is because the conductive adhesive contains carbon, which results in low tack.

Once the adhesive has been spread, the vinyl sheet is laid into it and pressed all over to ensure an even transfer of adhesive. The vinyl sheet is then folded back and left until the adhesive becomes tacky. When the adhesive is tacky, the vinyl sheet should be accurately re-laid, ensuring it does not twist or trap air bubbles. Seams must be without gaps and any excess adhesive should be removed as work proceeds. The vinyl sheet is then rolled with a 68kg articulated floor roller in the short direction first, then the long, and the rolling repeated between one and four hours later.

8.5.2 ESD Vinyl Tiles

Polyflor ESD vinyl tiles are installed by the same method as standard vinyl tiles – the single stick method. The grid layout for static control tiles is the same as for sheet vinyl, as described previously.

Note: ESD vinyl tiles must always be heat welded. See Section Welding vinyl flooring.

8.6 SPECIAL PRECAUTIONS

Special precautions must be taken with the following products:

8.6.1 Electrostatic Conductive (EC) Floorcoverings

Pipes or metal projections (e.g. metal gullies, door spring plates etc.) must be insulated from the EC floorcovering and free from conductive adhesive. The following method of installation is recommended.

The EC floorcovering should be cut 50mm short of any pipe or metal fixture. This infill area should be laid with a suitably coloured standard Polyflor sheet vinyl, adhered with a non-conductive adhesive. This infill piece should then be welded to the ESD floorcovering with a standard weld rod.

8.6.2 Conductive Floorcovering

Polyflor Conductive does not provide protection from a short circuit on a 240/250 volt mains. Where this material is installed, all electrical equipment and switches must be located outside the building. No portable electrical tools should be used inside, unless earth leakage circuit breakers are fitted to the switchgear.

8.7 HEAT WELDING

All Polyflor ESD floorcovering installations (excluding access panels) must be heat welded. Ideally, the floor should be left for a minimum of 24 hours before welding the joints. This will prevent adhesive bubbling up into the seams when heat is applied. For details of heat welding, see Section Welding vinyl flooring.

Note: Conductive welding rod is not a requirement with Polyflor ESD floorcoverings.

8.8 TEST METHODS

Worldwide, there are a great many test methods for electrical grade floorcoverings and, with rapid developments in the electrical and electronic industries, standards are constantly being reviewed. To ensure that the floor is tested to the latest specification, it is suggested that the architect or specifier should obtain a copy of the test method and requirements from the local office of the National Standards Authority. It should then be

Figure 25 Test electrode

attached to the specification prior to the ordering of materials and installation of the floor. If a test method is not specified, the following procedure is recommended and approved by Polyflor.

8.8.1 Test Procedure (BS 61340 -4-1)

The electrical testing of the floor must be carried out with an insulation tester, operating at 100 volts D.C.

8.8.2 Test Electrodes (BS 61340 -4-1)

The electrode consists of a brass cylinder 65mm in diameter, weighing approximately 2.5 kg. A screw connector attaches the test lead to the top surface of the cylinder. On the underside is attached a round rubber pad - of 5mm thickness and 65 mm in diameter - which has been covered with thin metal foil (Figure 25).

8.8.3 Test Conditioning

It is essential to condition the floor prior to testing. The floor should be cleaned (see Maintenance pdf) at least 24 hours before testing, and then conditioned for 24 hours at 40-60% RH and 20-25°C.

Note: The relative humidity and temperature are only critical for Polyflor Static Dissipative floorcoverings.

8.8.4 Test Method (BS 61340 -4-1)

One electrode should be placed on the floor. The second connection should be made to the earth point, the resistance being measured between the electrode and a known earth. One test should be made for every 2 square metres of flooring. The test may not be reliable if made within 24 hours of the flooring being laid or cleaned.

8.8.5 Testing to a Grid

The procedure of always testing the same points "on a grid" is not recommended. The whole floor should meet the specification, not just selected points. To ensure continual performance of the whole floor, it should be periodically tested at random points.

8.8.6 Test Results

Polyflor ESD floorcoverings are manufactured to specific levels of conductance and are tested, prior to despatch, in laboratory conditions.

On-site testing not only takes into account the floorcovering but also the adhesive, the subfloor and the environment. When installed and tested in accordance with the instructions laid down by Polyflor and detailed in this manual, the electrical resistance should be as follows:

EARTH TEST RESULTS		
	MINIMUM AVERAGE	MAXIMUM AVERAGE
Static Dissipative	1 x 10^6 ohms	1 x 10^9 ohms
Electrostatic Conductive	5 x 10^4 ohms	1 x 10^6 ohms
Conductive ROF	Zero ohms	5 x 10^4 ohms

The Customer Technical Services Department offers, for a fee, a finished installation testing service - to ensure that the whole installation meets the specification requirements.
A Certificate of Conformance is issued on completion. We recommend that you discuss your testing requirements with our Customer Technical Services team, to ascertain staff availability etc.

8.9 STATIC CONTROL SYSTEMS

In many instances, a Polyflor ESD floorcovering is sufficient to give the necessary control, but in highly static-sensitive areas, additional precautions may be necessary.

These include:

Dissipative clothing and footwear

Wrist and heel straps

Special work stations

Dissipative packaging and sealing

Ionisers and humidity controllers

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