integrated solutions

Electrostatic assessment of floors

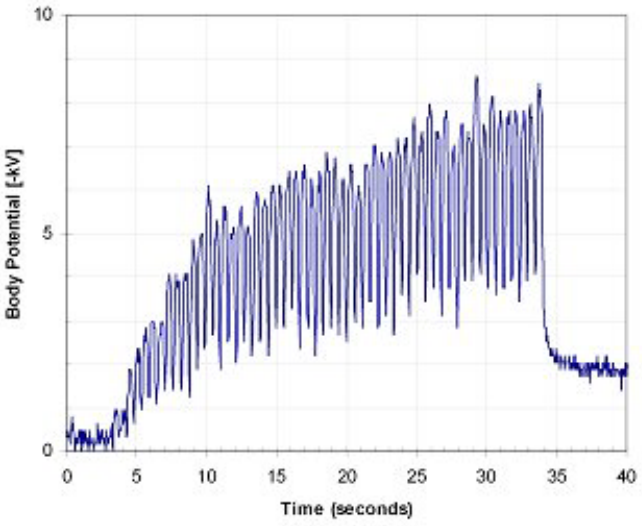
Email enquiry

ERA's Reliability and Failure Analysis group offers a range of electrostatic consultancy services to deal with all aspects of electrostatic charging associated with floor systems and flooring materials. We carry out on-site and laboratory assessments on behalf of many major flooring manufacturers, assess compliance of installed floors and troubleshoot static "shock" problems for manufacturing, retail and commercial clients throughout the UK and Europe.

Electrostatic charge build up can cause damage to electronic equipment and lead to personal injury. Our consultancy services help to prevent such incidents occurring, so avoiding costly equipment failure and possible litigation.

Why do I get a shock?

Many modern flooring tiles, carpets and coatings are highly insulating. High levels of electrostatic charge can be produced as people walk across the floor, particularly when the atmospheric humidity is low. Charge separation occurs between shoes and the flooring material, typically leaving negatively charged 'footprints' and producing a steadily increasing positive charge on the body. This may result in unexpected discharges between the body and other objects. Not only can this be painful, it may result in serious accidents, for instance when the person touches a handrail at the top of a flight of steps.



The trace (left) shows how a body potential of up to 8kV can be generated by normal walking, and 2kV remains when walking stops.

Great care is taken to prevent electrostatic charge build-up in industrial environments where semiconductor devices are fabricated or assembled. Suitable electrically conducting or static dissipative flooring is readily available, and is routinely fitted. However, owners and users of general commercial buildings are not usually aware of the serious consequences which can result from electrostatic charging, and continue to fit highly insulating floors. In these circumstances it is still possible to mitigate electrostatic charging by the use of floor maintenance products which make the floor more static dissipative and reduce the amount of charge produced by normal walking.

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Laboratory assessments

ERA has a walk-in environmental laboratory, fully equipped for the investigation of flooring materials. This allows us to replicate temperature and humidity conditions which exacerbate static charging problems and also test the compliance of flooring with published floor testing specifications. We offer this service to manufacturers of flooring materials and floor cleaning products, to flooring installers and to end users.

On site assessments

ERA consultants can visit your site and have considerable experience in spotting problems quickly and suggesting cost effective remedies. Measurements can be carried out conforming to European and USA standards to provide quantitative evidence of the problem. Measurements can then be repeated after remedial measures have been applied, to demonstrate that a satisfactory solution has been achieved.

Measurements and standards

ERA routinely carries out measurements of surface and volume resistance and resistivity, insulation resistance, charge decay and tribocharging (e.g. charge produced by walking) in accordance with international (IEC, ISO), regional (EN including 61340 series) and national (BS, DIN, ASTM, FTM) standards. Measurements to other standards can usually be arranged.

Case studies

ERA has tested conformance, and diagnosed and solved electrostatic problems recently arising in the following areas:

supermarket: shoppers reported getting shocks off trolleys.

tile flooring: tested a range of existing and new floor products against the latest EN standards.

microelectronics clean room: tested static dissipative floor installed in area where sensitive electronic components are handled.

new office and laboratory building: marble faced raised access floor system caused shocks when people walked on it and touched earthed objects.

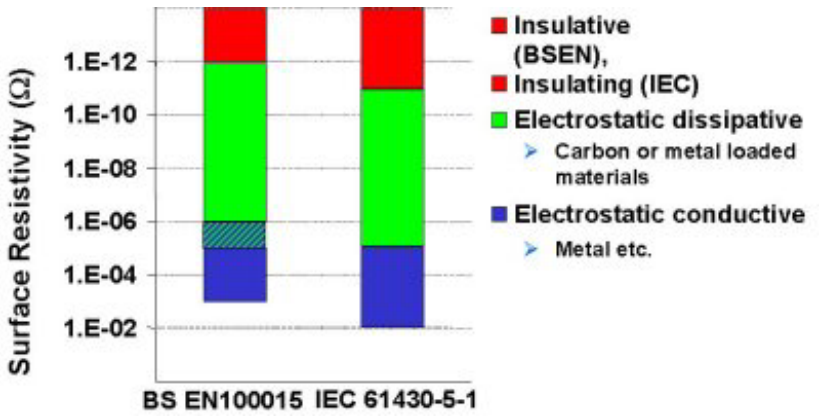
old office building: workers experiencing shocks in an office environment.

equipment for use in EPA: helped in the design of items specifically modified for use in an Electrostatic Protected Area (EPA) and demonstrated compliance.

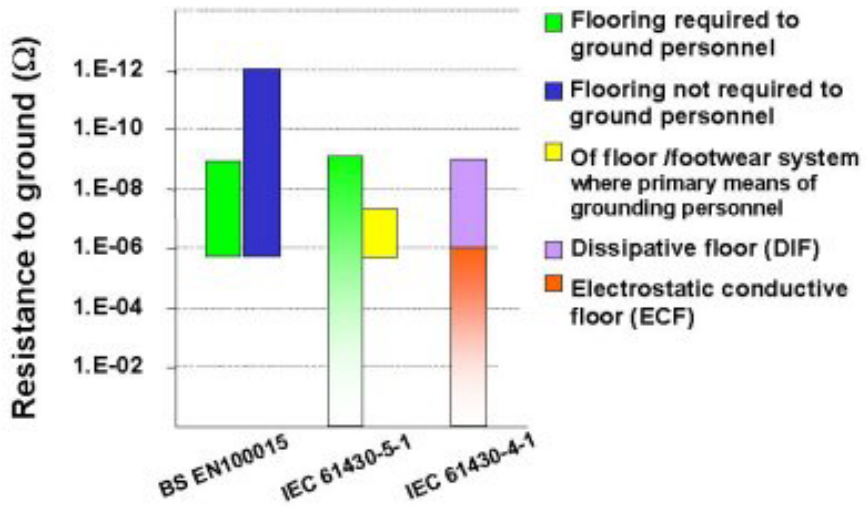
Technical insight

What is the meaning of terms like static dissipative, insulating and conductive? These terms are defined in some standards in terms of surface resistivity.

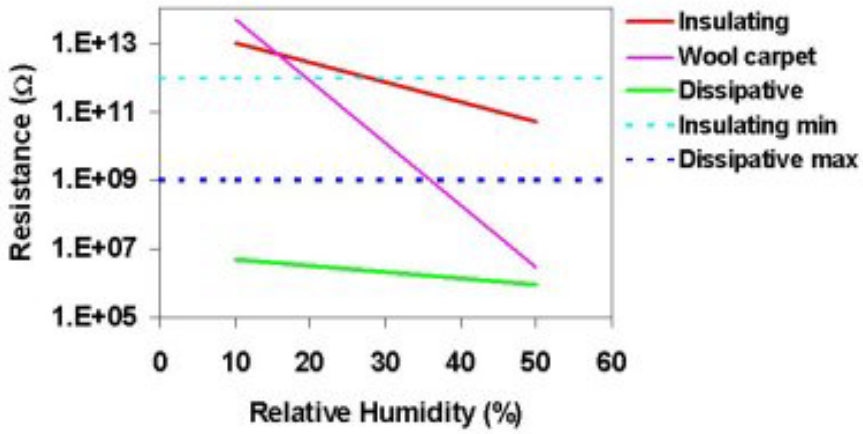
Notice that BS EN100015, which has been superseded by IEC or BS EN 61340-5-1, do not exactly agree on their definitions. Other standards, such as the oft cited BS2050, also introduce confusion.



Since dissipation of the charge to a common earth is normally the requirement, resistance to ground is a more critical parameter as shown by this diagram.



In should not be forgotten that the humidity of the air plays a vital part in determining how flooring materials behave, as shown below. Note especially how natural materials such as a wool carpet exhibit a large drop in resistance as humidity increases.



Related services and products

- **Electrostatic consultancy services**
  site surveys, testing of components and materials to BS IEC 61340 and many other standards, and evaluation of static prevention measures
- **Environmental testing laboratory**
  walk-in chamber, with temperature and humidity control
- **Failure analysis of electronic components**
  rapid, confidential, impartial service to identify causes of failures, distinguish between poor manufacture or misuse, and advise on corrective measures.