

**ESTAT-Garments “Protective clothing for use in the manufacturing of electrostatic sensitive devices”, EC Contract No. G6RD-CT-2001-00615.  
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## **Executive publishable summary**

An European research project “Protective clothing for use in the manufacturing of electrostatic sensitive devices (ESTAT-Garments)” is running with an aim to supply the standards body IEC TC101 (Electrostatics) with a basis to qualify the effectiveness of clothing used for the ESD-safe handling (commonly named ESD-garments) of ESD (ElectroStatic Discharge) sensitive devices and to develop appropriate test methods for the characterisation of such ESD protective garments. The approach is aimed at achieving an understanding of the electrophysical processes regarding composite textile materials as well as the total system, including the sensitive devices. This means that the project also offers the following objectives: 1) a physical basis for understanding the electrostatic processes within composite materials at large (i.e. not just the ones used for ESD-garments preparation), 2) an understanding of the complete system (operator, ordinary clothing, ESD-garments, ESD sensitive electronics), 3) providing results for manufacturers of garments and yarns to give them an incentive for product improvements.

The main purpose of ESD-garments in electronics industry is to protect sensitive electronics from ESD damage caused by a charged operator clothing. Thus any good test method for ESD protective garments should assess garment’s ability to provide ESD protection. During the first project year a lot of effort was paid for the assessment of risks for ESD damage of electronic components with reference to garments. In addition to the study of failure mechanisms and thresholds for damage of novel electronic devices, electrostatic processes on and in ESD fabrics, related to electrostatic discharges, were under study. The work continued in the second project year. The studies resulted in a list of potential factors which should be taken into account when evaluating test methods for ESD garments as well as for garment fabrics.

The evaluation of existing test methods for ESD garments and garment fabrics was the main issue of the second project year. The results showed that current resistance based standard test methods do not satisfactory characterise the protective performance of modern ESD garments. There are existing methods which, after modifications, have potential for test methods in future ESD garment and garment fabric standards, but completely new simple methods would potentially be needed. The development of such a new methods as well as the modification of selected existing methods were launched in the mid-term meeting of the project. The work will continue until the first months of the third project year. After that the reproducibility and repeatability of the new and/or modified test methods will be studied by interlaboratory (round robin) tests.

The main aim of the three-year project is to give basis for standardisation of test methods and requirements for garments used in electronics industry. Recommendations of test methods for future ESD garment standards could be given at the end of the project, after the interlaboratory tests are done and analysed. Recommendations for the use of the garments (including personnel safety aspects) will also be given at the end of the project.