MAKE US YOUR PARTNER!

Seibersdorf Laboratories develops experimental and numerical methods investigating all kinds of radiation effects in components and systems applied in various radiation fields.

Our mission is to offer expert services in radiation hardness assurance of components and systems according to EN ISO/IEC 17025 accreditation for the European industry, nuclear medicine and for academic research institutes.

Our vision is to become your leading partner in radiation exposure testing of your systems and components and support you with numerical investigations of your radiation tasks.

WHY RADIATION HARDNESS ASSURANCE?

Electronic components and systems show degradation in their electrical performance when exposed to ionizing radiation. Affected are devices used in space, aviation or in nuclear medicine. Radiation hardness assurance measures are needed to guarantee proper functionality.

Due to the increasingly diminishing component structures radiation sensitivity is increased. Effects caused by cosmic radiation on the earth's surface become relevant for electronic devices even in terrestrial applications such as automotive. Electronic components and systems that are to be used in sensitive areas need to be qualified with respect to their radiation resistance.

The corresponding test procedures are defined by international organizations such as the European Cooperation on Space Standardization (ECSS).

CONTACT

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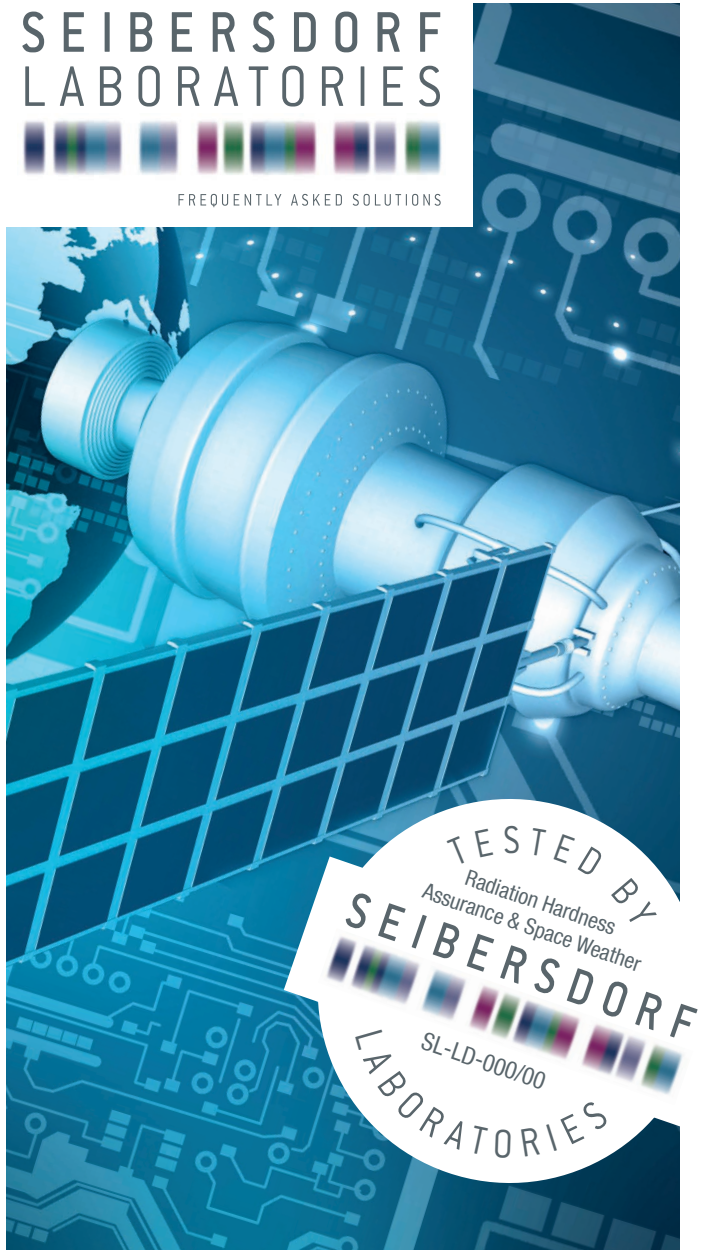
esa FFG bmvit

SEIBERSDORF LABORATORIES

FREQUENTLY ASKED SOLUTIONS

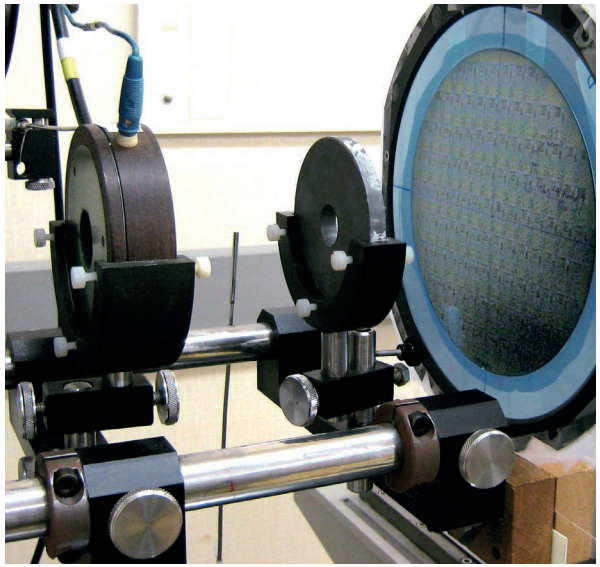


ACCREDITED TESTING LABORATORY

RADIATION HARDNESS ASSURANCE

TESTING LABORATORY

- Experimental and numerical investigations of all kinds of radiation effects in components and systems
- Performance analysis and evaluation of radiation exposure tests done at Seibersdorf Laboratories and external facilities
- Ensuring the operability of components and systems in typical radiation environments, such as in space, nuclear and accelerators facilities, nuclear medical applications
- Consulting users and manufacturers on the use of products in radiation environments
- Participation in the development of test procedures for the European Space Agency ESA
- Expertise in silicon wafer radiation exposure testing
- ELDRS (enhanced low dose rate sensitivity) testing expertise
- R&D of radiation sensors such as RADFET, microdosimeter, PIN diodes



Silicon wafer X-ray exposure testing

MODERN EQUIPPED FACILITIES

- Accredited TEC-Laboratory for 24/7 Co-60 gamma exposure at ESA standard and low dose rate radiation (100 µGy/s - 30 mGy/s)
- Co-60 teletherapy gamma irradiation facility (50 µGy/s - 5 mGy/s)
- Access to high dose exposure Co-60 gamma (500 mGy/s)
- 320 kV X-ray unit with radiation qualities according ISO and IEC standards (< 3 mGy/s)
- 160 kV X-ray unit as used for diagnostic radiology applications (< 3 mGy/s)
- 60 kV soft X-ray unit (<30 mGy/s)
- Access to 10MeV electron exposure facility (10 Gy/s)
- High Performance Computing cluster customized for Monte Carlo Simulations (FLUKA, Geant4, MCNPX, PHITS)
- Multifunctional equipped electronic laboratory such as standard electronic equipment and automatic component parameter analyser
- Versatile mechanical workshop, development and fabrication of irradiation and test boards

QUALITY STANDARDS

- EN ISO/IEC 17025
  Accredited Testing Laboratories No. 312
- EN ISO 9001:2008
  Quality Management Certification
- TID-testing compliant with ESCC-22900, MIL-STD-750-1A, and ECSS standards
- ESD compliancy with EN 61340-5-1
- Accredited Verification Laboratory No. 554
- Accredited Calibration Laboratory No. 612

CONTINUOUS DEVELOPMENT

ELDRS – An Experimental Survey

ELDRS (enhanced low dose rate sensitivity) of electronic components is important for component operation in a low dose rate radiation field, e.g. for satellites. Low dose rates and high total dose levels need long test duration and create high testing costs. An accelerated testing method using switching of high and low dose rates has been investigated. Statistical analysis has been performed to decrease test sample size.

Reference and Web-Link: Wind, M., Beck, P.; Boch, J.; Dusseau, L.; Latocha, M.; Poizat, M.; Zadeh, A., Applicability of the Accelerated Switching Test Method - A Comprehensive Survey, Radiation Effects Data Workshop (REDW), 2011.
http://eldrs.net

RADFET – Radiation Response Modelling

RADFET is a small type of integrating dosimeter based on a field effect transistor. The radiation response to photons, electrons, protons and neutrons of different energies has been modelled with Monte Carlo simulation (FLUKA, GEANT4) and compared to experimental measurements.

Reference: Wind, M.; Beck, P.; Jaksic, A., Investigation of the Energy Response of RADFET for High Energy Photons, Electrons, Protons, and Neutrons, IEEE Transactions on Nuclear Science, Volume: 56 Issue: 6, Page(s): 3387 – 3392, 2009.

e^2RAD – Shielding of Energetic Electrons

The performance of graded shielding of aluminium, lead and tantalum in energetic electron fields is investigated. Monte Carlo codes simulations using FLUKA and GEANT4 are compared with experimental measurements (5 MeV - 50 MeV). The results will be used for ESA's Jupiter Icy Moons Explorer (JUICE) mission.

Reference: Wind M., Bagalkote J., Beck P., Latocha M., Georg D., Stock M., Nieminen P., Truscott P.; e2-RAD: Results of the ESA Energetic Electrons Radiation Assessment Study, NSREC Contribution at the IEEE Nuclear and Space Radiation Effects Conference, Paris, 2014.