KARAX

SPACECRAFTS
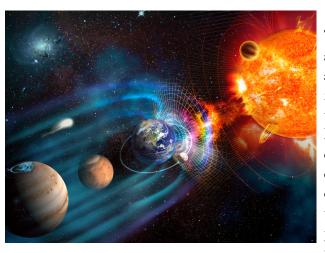
Materials that require evaluation:
1. Multilayer-insulation
2. PTFE Teflon
3. Adhesives
4. Epoxy Composite
5. Cyanate comp.
6. Cables (Spec 44/5)
7. Lubricants
8. Silicone
9. Polyamide Kapton
10. Polyurethane

Karax LLC offers an array of computational tools to meet your predictive modeling needs. K-Suite, our modular computational framework, can help guide your materials decisions with predictive tools for quantifying the effects of various damage processes on the mechanical behavior of polymeric components.

SOLUTIONS

The K-Load software module is contained within Karax Hybrid Aging and Performance Loss Prediction Platform (K-Suite) and is available as an Ansys or Abaqus Add-on Module. K-Load is a python-based software module which can be used concurrently with any commercial FEA software to model, simulate, and optimize degradation, reliability, and performance loss of polymeric components exposed to different environmental conditions during their service load. The program currently models adhesives, elastomers, coatings, resins, composites, thermal interface materials and other di-electric polymers used in electronics. K-Load enables users to understand the degradation, optimize the compound design, time the performance loss, and manage maintenance operations for different polymeric components.

K-Load enables users to answer questions like: how long does a component last in certain environment without losing performance below certain limit? How can we change the compound to achieve certain objectives (e.g., performance versus resilience)? Under what condition the material service-life drop below certain time? To predict the failure probability of COTS Polymeric components? How to define Total Ionizing Dose (TID) / Single Event Effects (SEE) acceptance criteria to define qualification test for auditing COTS polymeric components ?

BUSINESS VALUE

1. Our component-specific survivability prediction tools (K-Suite) can inform the design, maintenance, and purchase of Commercial Off-the-Shelf (COTS) micro-electronics.
2. Our high-fidelity damage accumulation model can help designers relax the hardness condition per component, minimize early retirement, and reduce weight/redundancy.
3. Our tool allows cheap & fast prediction of the survivability of Commercial Off-the-Shelf (COTS) products in extreme events
4. Our tool is relevant in survivability analysis of interconnects contained in distributed systems such as delivery vehicles, space sensors, military satellites, nuclear payloads.

RELEVANT MODULES

1. Gamma Radiation
2. X-Ray (under development)
3. Protons (under development)
4. UV
5. Atomic Oxygen (under development)
6. High frequency vibrations
7. Inert Thermal Aging (Vacuum Aging)
8. Thermal-Radiation Synergy