

Abstract Submitted
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Breakdown Analysis of Electrostatic Discharge SAMUEL HANSEN, ALLEN ANDERSON¹, JR DENNISON², Utah State Univ, USU MATERIALS PHYSICS GROUP TEAM — Material breakdown due to Electrostatic discharge (ESD) is the primary cause of spacecraft damage due to environment interactions in space. This occurs when the space plasma fluxes charge a craft to high voltages where insulating craft materials then break down. This failure allows current to flow freely through the material, this can damage or destroy onboard electrical systems. My project focuses on the effects of these breakdowns on suspect materials commonly used for electrical insulation in space. The USU Material Physics Group has performed ESD tests on hundreds of samples to date. The ESD damage sites of these samples have been analyzed for parameters including breakdown size, shape, location, thickness, and polymer type. The results have been recorded in an updatable ESD Quality Summary Table. Our table can be sorted internally, and is linked to the breakdown images. Initial trends within this data set are being identified and sorted based on experimental parameters in order to locate more trends. This data will aid in predicting which materials are best suited for use in high voltage scenarios found in space charging events.

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