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DEGRADATION OF THE ADHESIVE PROPERTIES OF MD-944 DIODE TAPE BY SIMULATED LOW EARTH ORBIT ENVIRONMENTAL FACTORS

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Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.The International Space Station (ISS) solar arrays utilize MD-944 diode tape with silicone pressure-sensitive adhesive to protect the underlying diodes and also provide a high-emittance surface. On-orbit, the silicone adhesive will be exposed and ultimately convert to a glass-like silicate due to atomic oxygen (AO). The current operational plan is to retract ISS solar array P6 and leave it stored under load for a long duration (6 mo or more). The exposed silicone adhesive must not cause the solar array to stick to itself or cause the solar array to fail during redeployment. The Environmental Effects Branch at Marshall Space Flight Center, under direction from the ISS Program Office Environments Team, performed simulated space environment exposures with 5-eV AO, near ultraviolet radiation and ionizing radiation. The exposed diode tape samples were put under preload and then the resulting blocking force was measured using a tensile test machine. Test results indicate that high-energy AO, ultraviolet radiation, and electron ionizing radiation exposure all reduce the blocking force for a silicone-to-silicone bond. AO exposure produces the most significant reduction in blocking force.



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