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Comments on the Interaction of Materials with Atomic Oxygen

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This paper contains an explanation of the relative resistance of various materials to attack by atomic oxygen. An interpretation of previously published data from both ground based and on-orbit experiments, and measurements carried out in Boeing's own laboratories, is presented. The results indicate the importance of bond strengths, size and structure of pendant groups, and fluorination to the resistance of certain polymers to atomic oxygen. A theory which provides a partial explanation of the degradation of materials in low earth orbits due to surface recombination of oxygen atoms is also included. Finally, a section commenting on mechanisms of material degradation is provided.