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# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Flammability Study of Materials in Oxygen Environments

An extensive study has been made of the flammability of a wide variety of commercial materials in oxygen-rich environments. The data may be readily extrapolated to normal atmospheric conditions, with the understanding that some of the materials found unsatisfactory under high oxygen concentrations may be nonflammable under normal conditions.

The study is described in a published report that presents the flame-propagation rates and flammability ratings of 780 specimens of commercially available plastics, elastomers, coatings, fabrics, and other sheet materials. Test results are also given for over 170 samples of the most-commonly-used electrical harnesses, connectors, and potting compounds. In addition, flammability tests are reported for a number of specific electrical configurations, such as harness assemblies and printed-circuit boards.

In general it has been found that the flammability of organic materials depends not only on their

chemical composition but also on the thickness of the material. Some materials (e.g., cellulose, butyrate, and polycarbonates) are flammable at all thicknesses (in enriched oxygen), while for others (highly fluorinated materials and polyimides) there is usually some thickness at which they are essentially nonflammable.

#### **Note:**

Requests for further information may be made in writing to:

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