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Evaluation of Polymeric Products for Use in Thermal-Vacuum Environment

An investigation was conducted to qualify commercial polymeric products for use in a thermal-vacuum environment (125°C, 10⁻⁵ torr). Approximately 350 materials were screened for outgassing characteristics, of which 100 qualified within the limits of less than 1% weight-loss and less than 0.1% VCM (volatile condensable material) content. Approximately 20 products were examined in greater detail and proved satisfactory. They retained their mechanical and electrical properties through decontamination cycles and exposure to the specified thermal-vacuum conditions.

The theory of the release and condensation of substances from polymers exposed to a thermal vacuum environment is evaluated. Equipment and procedures for identifying and measuring the release of VCM are developed, as well as test equipment and techniques for evaluating the effects of decontamination and thermal-vacuum exposure on specific properties of the polymeric products.

Infrared absorbance spectra of the VCM from 96 polymeric products and an interim list of recommended products are identified. All of the examined products are listed in an alphabetical index; an ac-

ceptance rating, based on test results, is assigned to each one.

Note:

The following documentation may be obtained from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-CR-89557 (N67-40270), Polymers for
Spacecraft Applications

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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