Materials Engineering Branch

TIP*

No. 108 Contamination from Velcro

Author(s): Mark A. Domen Contact: (301) 286-6882

The holding ability of Velcro brand hook and loop fasteners is accomplished by the engagement of many strong monofilament hooks of one tape into durable loop filaments of another tape. Peeling one tape from the other separates the elements. Because the tapes are convenient and reusable many times Velcro brand (as well as hook and loop fasteners from other manufacturers) have been used on many space flight projects, especially for attaching thermal blankets. GSFC has traditionally recommended the polyester type Velcro because it has lower outgassing characteristics than Nylon.

The Materials Engineering Branch was asked to evaluate two conductive Velcro Materials proposed for uses involving EMI/RFI shielding and grounding across thermal blankets. One product (Hi-Garde Velcro) is made with stainless steel hooks and loops; the other (Hi-Meg Velcro) is made from silver impregnated Nylon hooks and loops. Repeated mating/demating of these fasteners generated large quantities of conductive fibers and particles that, in a zero gravity environment, could float throughout the spacecraft and pose a hazard to adjacent electronic components. Therefore, neither product is acceptable for general space flight use.

All hook and loop type fasteners (including polyester) generate particulate contamination as a result of repeated mating/demating operations. They should not be used near optics or detectors that can be degraded by particulates. The following precautions will help to reduce contamination from hook and loop type fasteners:

1. Thoroughly clean the material, before installation on the spacecraft, to remove lint and dust remaining from the manufacturing and handling processes.

2. After each mating/demating operation, vacuum the area to remove any particulates that are produced.

3. Keep the number of mating/demating cycles to a minimum to keep from fraying the fibers that will generate additional contamination.

4. Use polyester material to minimize outgassing.

5. Do not use metallic or metallic impregnated materials.