ENVIRONMENTAL SERIES 23

Space-Grade Guidelines for SuperNine® Connectors

Outgassing

Space flight equipment requires low-outgassing components in order to prevent degradation to optics and other sensitive instruments. SuperNine® connectors contain nonmetallic materials such as rubber, plastic, adhesives and potting compounds which can give off gasses when subjected to a vacuum or high heat. Unless the connector is specially processed, the TML and CVCM can exceed allowable limits. The space industry has adopted a standardized test procedure, ASTM E595, to evaulate outgassing properties. The MIL-DTL-38999 specification Class G also details specific TVM and CVCM values in addition to finish specifications. In Glenair's 186T process, for example, connectors and connector materials are heated to 175° C at a vacuum of 5 X 10^{-6} Torr for 48 hours. Items under test are then weighed to calculate the Total Mass Loss (TML), which may not exceed 1.0% of the total initial mass. A collector plate is used to determine the Collected Volatile Condensable Material (CVCM), which may not exceed 0.1% of the total original specimen mass for Class G rated connectors. Glenair is able to offer outgas processing which assures all materials comply with their respective standards.

Note on Connector Material and Finish Options

Some types of metals are prohibited for space flight. "Pure Tin, Cadmium and Zinc shall not be used as a final finish on EEE parts." (NASA EEE-INST-002 Instructions for EEE Parts Selection, Screening, Qualification, and Derating). NASA recommends electroless nickel or gold finish on connector shells and gold finish for contacts.

- **SuperNine® environmental series connectors may be subjected to outgas processing and/or NASA screening IAW MIL-DTL-38999 Class G**
- **Modification codes are a convenient way to specify outgassing / screening requirements per NASA specifications and/or D38999 Class G**
- **Cadmium and silver finish are prohibited in space**
- **Specify electroless nickel finish on connector shells and gold finish on contacts**