



# ENVIRONMENTAL SERIES 23 Space-Grade Guidelines for SuperNine® High-Speed 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 evaluate 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  $5 \times 10^{-6}$  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