

Class G and NASA Space-Grade Guidelines

NASA and Class G Screening

The MIL-DTL-38999 specification defines TML and CVCM values for Class G space flight. Glenair modification code 186T assures parts are outgassed to meet the Class G requirements for outgassing.

Additionally, NASA recommends that connectors for space flight be specially screened. NASA EEE-INST-002 instructions for EEE parts selection, screening, qualification, and derating contains three levels of screening for space-grade components. These outgassing and screening modification codes are listed at right. To add a modification code append code to end of part number: 233-219-G6ME11-1AN-**429C**.

- **"Mission critical" connectors for space flight should undergo rigorous 100% final inspection**
- **Modification codes are available to invoke special screening for both MIL-DTL-38999 and NASA applications**
- **Outgassing properties of materials used in Glenair SuperNine® connectors are detailed in the table below**



| Screening Level and Available Outgassing Modification Codes | | | | |
|---|-----------------------------|-----------------------------|---|-------|
| Screening Level | Screening Only | 48 Hour Oven Bake 175° C | Thermal Vacuum Outgassing (10 ⁻⁶ Torr) | |
| | | 24 Hour 125° C | 48 Hour 175° C | |
| NASA, Level 1 Highest Reliability | 429B | 429J | 429C | |
| NASA, Level 2 High Reliability | 429 | 429K | 429A | 429AA |
| NASA, Level 3 Standard Reliability | Use Standard Part Number | | 429L | |
| 38999, Class G or H (Group A and B inspection, no screening) | | | | 186T |

| Table II: NASA EEE-INST-02, Table 2A Screening Levels | | | |
|---|---------|---------|---------|
| Inspection | Level 1 | Level 2 | Level 3 |
| Visual | 100% | 100% | 100% |
| Mechanical | 2(0) | 2(0) | |
| Dielectric Withstanding Voltage | 2(0) | 2(0) | |
| Insulation Resistance | 2(0) | 2(0) | |
| Contact Engagement & Separation Force | 2(0) | | |
| Hermeticity (Sealed Receptacles Only) | 100% | 100% | |
| Coupling Force | 2(0) | | |

Required inspection quantity shown. Number in parenthesis indicates acceptance of failures allowed for all quantities inspected.

| Outgassing Properties of Materials Used in MIL-DTL-38999 Type SuperNine® Connectors | | | | |
|---|---|-------|--------|---|
| Component | Material | TML % | CVCM % | Test Reference |
| Front and Rear Insulator | Epiall 1908 | 0.84 | 0.0 | NASA Test # GSC15435 (48 hours at 180°C) |
| Rear Grommet, Interfacial Seal, Peripheral Seal, and Special Auxiliary Seals | Blended fluorosilicone/silicone elastomer | 0.04 | 0.0 | Glenair test |
| Front-To-Rear Insulator Bonding Material | Eccobond 104 A/B | 0.52 | 0.08 | Emerson & Cuming Data Sheet |
| Insulator-to-Rubber Bonding Material | RTV, per MIL-A-46146 | <1.0 | <0.1 | Glenair Test |
| White Epoxy Ink for Silk-screening | Markem 7224 White | 0.49 | 0.03 | NASA Test #GSC19899 |
| Potting Compound | High-performance space-grade epoxy | <1.0 | <0.1 | Glenair Test |

| MIL-DTL-38999 Type SuperNine® Connector Materials Approved for Space Flight | | |
|---|---|--------------------------------|
| Component | Material | Notes |
| Shells, Coupling Nuts, Jam Nuts | Aluminum alloy | Approved for Space Flight |
| Rigid Insulators | Glass reinforced thermoset plastic, Epiall 1908 | Approved for Space Flight |
| Contact Retention Clip | Beryllium copper, heat-treated, unplated | Approved for Space Flight |
| Grommet, Peripheral Seal, Interfacial Seal, Special Auxiliary Seals, O-ring | Blended fluorosilicone/silicone elastomer | Requires outgassing processing |
| Pin/Socket Contact | Gold plated beryllium copper alloy | Approved for Space Flight |
| Socket Contact Hood | Stainless steel | Approved for Space Flight |
| Potting Compounds and Adhesives | RTV and epoxies | Requires outgassing processing |