SuperNine® Hermetic connectors

MIL-DTL-38999 Series III Type

Class H and NASA space-grade application guides

NASA and Class H Screening and Outgassing Requirements

NASA requires that connectors for space flight be specially screened. NASA EEE-INST-002 standards for EEE parts are divided into 3 levels of screening for space-grade components; refer to Table II for details. For space applications, begin by selecting the desired NASA screening level and outgassing modification code from Table I. MIL-DTL-38999 specification defines TML and CVCM values for Class H space flight rated hermetic connectors. Glenair modification code 186T provides Class H outgassing equivalency for SuperNine commercial hermetic part numbers without screening.

To add a modification code append code to end of part number, for example: *233-265-H2Z117-26PN02-**429C***. Additional screening may be added and will appear as separate line item on customers order.

- **"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 Series 23 SuperNine® glass-seal hermetic connectors are detailed in the table below**

Table I: Screening Level and Available Outgassing Modification Codes

Screening Level	Screening Only	48 Hour Oven Bakeout +175° C	Thermal Vacuum Outgassing[2]	
			24 Hour +125° C	48 Hour +175° C
NASA, Level 1 Highest Reliability	429B	429J	429C	
NASA, Level 2 High Reliability	429	429K	429A	
NASA, Level 3 Standard Reliability	Use Standard Part Number		429L	
D38999 Class H[1] No Screening				186T

1. Class H is **only** applicable to QPL part numbers. Mod code 186T provides equivalent outgassing processing of non-qualified parts. Additional screening available as a separate line item on the customer's purchase order. 2. Thermal vacuum of 10^-6 Torr.

Table II: NASA EEE-INST-02, 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 Hermetic Connectors

Component	Material	TML %	CVCM %	Test Reference
Front and Rear Insulator	Front: high-grade rigid dielectric Rear: Epiall®	0.84	0.0	NASA Test # GSC15435 (48 hours at 180°C)
Grommet, Peripheral Seal and Interfacial Seal	Blended fluorosilicone/silicone elastomer	0.04	0.0	Glenair test
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

MIL-DTL-38999 Type SuperNine Hermetic Connector Materials Approved for Space Flight

Component	Material	Notes
Shells, Coupling Nuts, Jam Nuts	Stainless Steel	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, 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
Hermetic Insert	Vitreous Glass	Approved for Space Flight