Series 791 Connectors for Space Flight

Series 791 Scoop-Proof connectors are suitable for space applications. The connector should undergo a thermal vacuum bakeout in order to meet outgassing limits, as required by NASA and MIL-DTL-38999 Class G. Add a suffix code to the connector part number to specify the bakeout operation. Special NASA screening is also available via suffix code.

OUTGASSING

Space flight equipment requires low-outgassing components in order to prevent degradation to optics and other sensitive instruments. The space industry has adopted a standardized test procedure, ASTM E595, to evaulate outgassing properties. In the ASTM test, material samples are heated to 125 °C at a vacuum of 5 X 10^{-5} torr for 24 hours. The test sample is 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.

Series 791 Scoop-Proof connectors contain nonmetallic materials including 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. Glenair is able to offer two bakeout processes which assure ASTM E595 compliance:

Standard Bakeout (24 hour/ +125 °C per NASA EEE-INST-002)

"Class G" Bakeout (48 hour/ +175 °C).

The higher temperature Class G bakeout is recommended for maximum removal of volatiles and is standard for Glenair MIL-DTL-38999 Class G space grade connectors.

VACUUM BAKEOUT MODIFICATION CODES

Requirement	Modification Code	Vacuum Bakeout Duration	Vacuum Bakeout Temp.
Standard Bakeout *NASA EEE-INST-002*	-186M	24 Hours	+125 °C
Class G Bakeout *Maximum Removal of Volatiles*	-186T	48 Hours	+175 °C

NASA SCREENING

NASA recommends special screening for space grade connectors. NASA EEE-INST-002 *Instructions for EEE Parts Selection, Screening, Qualification, and Derating* contains three levels of screening: level 1 for highest reliabity, level 2 for high reliability and level 3 for standard reliability. Glenair suffix codes are available to invoke NASA screening.

MODIFICATION CODES FOR VACUUM BAKEOUT PLUS NASA SCREENING

Screening Level *NASA EEE-INST-002 Table 2A*	Modification Code	Vacuum Bakeout Duration	Vacuum Bakeout Temp.
Level 1 *Highest Reliability*	-429C	24 Hours	+125 °C
Level 2 *High Reliability*	-429A	24 Hours	+125 °C
Level 3 *Standard Reliability*	-429L	24 Hours	+125 °C

MODIFICATION CODES FOR NASA SCREENING (NO BAKEOUT)

Screening Level *NASA EEE-INST-002 Table 2C*	Modification Code
Level 1 *Highest Reliability*	-429B
Level 2 *High Reliability*	-429
Level 3 *Standard Reliability*	(Mod Code not required)

PROHIBITED MATERIALS

Some types of metal finishes are prohibited for space flight. "Cadmium, zinc, chemically coated cadmium or zinc, or silver shall not be used as a connector or contact finish" (NASA EEE-INST-002 Instructions for EEE Parts Selection, Screening, Qualification, and Derating). NASA recommends electroless nickel or gold plating on connector shells and gold plating for contacts.