GT-25-221

CODE RED Lightweight Hermetic Encapsulant Pressure Cycling Testing

GLENAIR DOCUMENT APPROVED FOR CUSTOMER DISTRIBUTION

Revision	Description of Changes	Date	Author
1	Initial Release	11/25/2025	Trevor T.

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1. Scope

The objective of this report is to document performance results for Glenair's CODE RED Lightweight Hermetic connectors after pressure cycling. All tests were performed against MIL-STD-38999N Series III requirements.

2. Summary

Twelve (12) connectors were built and subject to 36,520 cycles of pressure differential (14.7 psi to 24 psi). After pressure cycling, all connectors were able to pass the maximum helium leakage rate requirement of 1.0×10^{-7} cm^3/sec, DWV (Dielectric Withstanding Voltage) and IR (Insulation Resistance) requirements per MIL-DTL-38999, Series III requirements on MIL-STD-1560's 25-35 insert arrangement. The table below summarizes the sealing performance outcome of the tested connectors.

Table I: Summary of Test Results

Part Number	Quantity Tested	Pressure Cycling	Helium Leakage Rate	DWV	IR
233-253-M7ME25-35PN	12	✓	PASS	PASS	PASS

3. Applicable Documents

MIL-DTL-38999N W/Amendment 1	CONNECTORS, ELECTRICAL, CIRCULAR, MINIATURE, HIGH DENSITY, QUICK DISCONNECT (BAYONET, THREADED OR BREECH COUPLING), ENVIRONMENT RESISTANT WITH CRIMP REMOVABLE CONTACTS OR HERMETICALLY SEALED WITH FIXED, SOLDERABLE CONTACTS, GENERAL SPECIFICATION FOR
MIL-STD-1560	INSERT ARRANGEMENTS FOR MIL-DTL-38999, MIL-DTL-27599, AND SAE-AS29600 SERIES A ELECTRICAL CIRCULAR CONNECTORS
EIA-364-20	Withstanding Voltage Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts
EIA-364-21	Insulation Resistance Test Procedure for Electrical Connectors, Sockets, and Coaxial Contacts

4. Sample Information and Testing Sequence

Twelve (12) connectors (Part Number: 233-253-M7ME25-35PN) were manufactured then pressure cycle tested. After pressure cycle testing, leak rate and electrical testing (DWV, then IR) were performed.

5. Pressure Cycle Testing

Connectors were sealed in an atmospheric environment and the encapsulants were subject to 36,520 cycles of pressure differential, from 14.7 psi (atmospheric) to 24 psi. The ramp up and down rates were both 80 psi/minute with a 30 second dwell time at each minimum and maximum pressure.

After pressure cycle testing, leak rate was performed on each connector against requirements outlined in MIL-DTL-38999.

6. Electrical Testing

Following pressure cycle and helium leak rate testing, DWV (Dielectric Withstanding Voltage) and IR (Insulation Resistance) testing was performed at ambient temperature in accordance with EIA-364-20 and EIA-364-21 respectively and subject to requirements outlined in MIL-DTL-38999.

7. Results

Table II: Post Pressure Cycle Testing, Helium Leakage Rate of Connectors

Sample Number	Helium Leak Rate (cm^3/sec)	Pass/Fail?
1	3.2×10^{-8}	PASS
2	1.3×10^{-8}	PASS
3	2.3×10^{-8}	PASS
4	2.4×10^{-9}	PASS
5	2.9×10^{-9}	PASS
6	4.1×10^{-9}	PASS
7	4.1×10^{-9}	PASS
8	4.0×10^{-8}	PASS
9	2.4×10^{-9}	PASS
10	3.9×10^{-9}	PASS
11	1.9×10^{-9}	PASS
12	2.5×10^{-9}	PASS

Table III: Post Pressure Cycle Testing, DWV and IR Test Results of Connectors

Sample Number	DWV Test Voltage (VAC)	IR Test Voltage (VDC)	Pass/Fail?
1	1300	500	PASS
2			PASS
3			PASS
4			PASS
5			PASS
6			PASS
7			PASS
8			PASS
9			PASS
10			PASS
11			PASS
12			PASS

8. Conclusion

Connectors built with CODE RED Lightweight Hermetic Encapsulant (up to MIL-STD-1560 25-35 insert arrangement) meet helium leakage, DWV, and IR performance requirements per MIL-DTL-38999 Series III after pressure cycle testing (36,520 cycles from 14.7 psi to 24 psi).