



TEST REPORT

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Resistance of Glenair Products to Gamma Radiation Exposure (Ref. QTP-939)

Revision	Description of Changes	Date	Author
1	Initial Release	3/15/2021	Micah Summers
2	Added wire bend test data in Table 3	10/31/2022	Micah Summers



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1. Scope

This test report documents the change in Insulation Resistance (IR), Dielectric Withstanding Voltage (DWV), Insert Retention, Contact Retention and Hermeticity of selected Glenair finished products following exposure to 5 kGy (0.5 MRad), 10 kGy (1 MRad), 100 kGy (10 MRad), and 1000 kGy (100 MRad) of gamma radiation exposure, where applicable. All tests were performed according to QTP-939 Revision B.

2. Applicable Standards/Specifications

ASTM D 3032	Standard Test Method for Hookup Wire Insulation
EIA-364-20	Dielectric Withstanding Voltage Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts
EIA-364-29	Contact Retention Test Procedure for Electrical Connectors
EIA-364-35	Insert Retention Test Procedure for Electrical Connectors
EIA-364-02	Air Leakage Test Procedure for Electrical Connectors

3. Test Specimens

The part numbers and full description of the parts tested are listed in Table 1.

Table 1: Test Item Description

Part Number	Description
961-037-T-C-1	Siltem on Turboflex™ wire 8 AWG (0.016" wall thickness)
961-004-N-C-2	Duraelectric™ on Turboflex™ wire 8 AWG (0.030" wall thickness)
961-033-N-F-0	Duraelectric™ K on Turboflex™ wire 2 AWG (0.061" wall thickness)
961-041-N-C-6	Duraelectric™ Light on Turboflex™ wire 8 AWG (0.030" wall thickness)
806-012-Z19-11SMA, 806-020-Z19-11PMA	Mighty Mouse Series 806 mated connector assembly
790-024PB-9MN, 790-025SB-9NMN	Series 79 mated connector assembly
233-250ME19-11PN	Generation III Code Red unmated connector assembly



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4. Summary of Results

The results of the tests are summarized in Tables 2 – 4.

Pass result indicates no significant change in performance of parts after exposure to gamma radiation.

Table 2: Electrical Testing of Wire Insulation

	IR, 500 VDC 60 seconds, ASTM D3032 (5000 MΩ min.)	DWV, 500 VDC 60 seconds, ASTM D3032 (Leakage Current 0.5 mA max.)
Siltem on Turboflex™ wire (P/N: 961-037-T-C-1)		
Original Properties	>10,000	0.0
After 5 kGy (0.5 MRad)	Pass	Pass
After 10 kGy (1 MRad)	Pass	Pass
After 100 kGy (10 MRad)	Pass	Pass
After 1000 kGy (100 MRad)	Pass	Pass
Duraelectric™ on Turboflex™ (P/N: 961-004-N-C-2)		
Original Properties	>10,000	0.0
After 5 kGy (0.5 MRad)	Pass	Pass
After 10 kGy (1 MRad)	Pass	Pass
After 100 kGy (10 MRad)	Pass	Pass
After 1000 kGy (100 MRad)	Pass	Pass
Duraelectric™ K on Turboflex™ (P/N: 961-033-N-F-0)		
Original Properties	>10,000	0.0
After 5 kGy (0.5 MRad)	Pass	Pass
After 10 kGy (1 MRad)	Pass	Pass
After 100 kGy (10 MRad)	Pass	Pass
After 1000 kGy (100 MRad)	Pass	Pass
Duraelectric™ Light on Turboflex™ (P/N: 961-041-N-C-6)		
Original Properties	>10,000	0.0
After 5 kGy (0.5 MRad)	Pass	Pass
After 10 kGy (1 MRad)	Pass	Pass
After 100 kGy (10 MRad)	Pass	Pass
After 1000 kGy (100 MRad)	Pass	Pass



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Table 3: Wire Bend Test after 1000 kGy (100 MRad) Gamma Radiation Exposure

Test Sample	Bend Test, AS4373 Method 712 (Average Results)
Siltem on Turboflex™ wire (P/N: 961-037-T-C-1)	No cracks or damages to insulation
Duraelectric™ on Turboflex™ (P/N: 961-004-N-C-2)*	Additional crack formed due to sharp turn of sample around mandrel
Duraelectric™ K on Turboflex™ (P/N: 961-033-N-F-0)*	No additional cracks or damages to insulation
Duraelectric™ Light on Turboflex™ (P/N: 961-041-N-C-6)*	Additional crack formed due to sharp turn of sample around mandrel

*Pre-existing cracks and scratches were found on samples prior to performing the bend test. Damages could be due to shipping/handling of product.

Table 4: Electrical and Mechanical Testing of Connectors

Property	Test Method	Result
Mighty Mouse Series 806 (P/N: 806-012-Z19-11SMA, 806-020-Z19-11PMA)		
Original Properties		
IR, 500 VDC 60 seconds (5000 MΩ min.)	EIA-364-20	>10,000
DWV, 1300 VAC 60 seconds (Leakage Current 2 mA max.)	EIA-364-20	0.0
Insert Retention, 25 ± 2 lbf min. at 1 lbf/sec. to 10 sec.	EIA-364-35	Pass
Contact Retention, 10 ± 1 lbf min. at 1 lbf/sec. for 10 sec.	EIA-364-29	Pass
After 5 kGy (0.5 MRad)		
IR, 500 VDC 60 seconds	EIA-364-20	Pass
DWV, 1300 VAC 60 seconds	EIA-364-20	Pass
Insert Retention	EIA-364-35	Pass
Contact Retention	EIA-364-29	Pass
After 10 kGy (1 MRad)		
IR, 500 VDC 60 seconds	EIA-364-20	Pass
DWV, 1300 VAC 60 seconds	EIA-364-20	Pass
Insert Retention	EIA-364-35	Pass
Contact Retention	EIA-364-29	Pass



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Property	Test Method	Result
Series 79 (P/N: 790-024PB-9MN and 790-025SB-9NMN)		
Original Properties		
IR, 500 VDC 60 seconds (5000 MΩ min.)	EIA-364-20	>10,000
DWV, 750 VAC 60 seconds (Leakage Current 2 mA max.)	EIA-364-20	0.0
Insert Retention, 25 ± 2 lbf min. at 1 lbf/sec. to 10 sec.	EIA-364-35	Pass
Contact Retention, 10 ± 1 lbf min. at 1 lbf/sec. for 10 sec.	EIA-364-29	Pass
After 5 kGy (0.5 MRad)		
IR, 500 VDC 60 seconds	EIA-364-20	Pass
DWV, 750 VAC 60 seconds	EIA-364-20	Pass
Insert Retention	EIA-364-35	Pass
Contact Retention	EIA-364-29	Pass
After 10 kGy (1 MRad)		
IR, 500 VDC 60 seconds	EIA-364-20	Pass
DWV, 750 VAC 60 seconds	EIA-364-20	Pass
Insert Retention	EIA-364-35	Pass
Contact Retention	EIA-364-29	Pass
38999 Generation III Code Red (P/N: 233-250ME19-11PN)		
Original Properties		
IR, 500 VDC 60 seconds (5000 MΩ min.)	EIA-364-20	50,000
DWV, 2300 VAC 60 seconds (Leakage Current 2 mA max.)	EIA-364-20	0.08
Hermeticity (Helium Leak Detection, 1.00E-07 cc/seconds max.)	EIA-364-02	1.60E-09
After 5 kGy (0.5 MRad)		
IR, 500 VDC 60 seconds	EIA-364-20	Pass
DWV, 2300 VAC 60 seconds	EIA-364-20	Pass
Hermeticity (Helium Leak Detection)	EIA-364-02	Pass
After 10 kGy (1 MRad)		
IR, 500 VDC 60 seconds	EIA-364-20	Pass
DWV, 2300 VAC 60 seconds	EIA-364-20	Pass
Hermeticity (Helium Leak Detection)	EIA-364-02	Pass