Glenair, Inc. 1211 Air Way, Glendale, California, 91201
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QUALIFICATION TEST REPORT FOR GLENAIR SERIES 79 MICRO-CRIMP CONNECTORS

REPORT NO. GT-16-118
JULY 15, 2016

APPROVALS
***Signatures on file**

PREPARED BY:	**DON NGUYEN** **SENIOR TEST ENGINEER**	**DATE:** 07/15/2016
APPROVED BY:	**DENNIS JONES** **SENIOR PROJECT ENGINEER**	**DATE:** 07/15/2016
APPROVED BY:	**MIKE GHARA** **DIRECTOR OF ENGINEERING**	**DATE:** 07/15/2016

REVISION HISTORY

REVISION LETTER	DESCRIPTION OF REVISION	DATE	APPROVAL
A	Initial Release	07/12/2016	07/15/2016

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ABSTRACT

Glenair, Inc. Conducted qualification testing on high performance Series 79 Micro-Crimp Connectors to determine their ability to meet specific mechanical, environmental and electrical performance requirements of outlined in the Series 79 Micro-Crimp Connectors Performance Specification. These requirements meet or exceed those of MIL-DTL-24308G and were tested in accordance with EIA-364 test procedures. See product specification below for details.

Seventeen (17) mated pair of connectors; plug and receptacle passed all the test requirements listed on the following page.

The summary of test results (Group 1, 2, 3 and 4) are located in the Glenair Italia laboratory test report number T598257 IECQ, page 2 of 86.

The qualification testing of Series 79 Micro-Crimp Connectors was successfully carried out over the period of 08-18-15 thru 07-11-16 in the Test Laboratory Glenair Italia S.P.A.
No failures were recorded during tests on all test samples.

SCOPE

This report documents the results of the qualification testing performed on Series 79 Micro-Crimp connectors and as part of the test plan requirements referenced qualification (QTP-406) The tests were performed by Test Laboratory Glenair Italia S.P.A.

REFERENCE DOCUMENTS

MIL-DTL-24308G	Connectors, Electric, Rectangular, Removable Crimp Non-environmental, Miniature, Polarized Shell, Rack and Panel, General Specification For
EIA-364	Electrical Connector/Socket Test Procedures Including Environmental Classifications
MIL-STD-202	Test Method Standard for Electronic Equipment
QTP-406	Qualification Test Plan for Series 79 Micro-Crimp Connectors

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TEST ITEM DESCRIPTION

Seventeen (17) mated pair of connectors; plug and receptacle samples were submitted for the qualification testing. The test samples were identified follows;

The summary of test results (Group 1, 2, 3 and 4) are located in the Glenair Italia laboratory test report number T598257 IECQ, page 2 of 86.

APPENDIX A

TEST LABORATORIES, GLENAIR ITALIA S.P.A
TEST REPORT NUMBER
T598257 IECQ

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APPENDIX B

GLENAIR, INC.
QUALIFICATION TEST PLAN
QTP-406

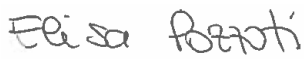
Test Laboratory Glenair Italia s.p.a.
Via del Lavoro 7, Quarto Inferiore – Granarolo dell'Emilia (BO) 40057, Italy

Client - cliente**: Glenair Inc.**

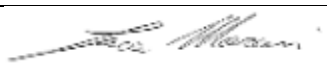
Reference contact - contatto**: Don Nguyen**

Title - titolo**:**

Serie 79 connector qualification

Tests carried out by - test eseguito da**:** **L. Marani** **E. Pozzati**	
Test report compiled by - rapport di prova scritto da**:** **E. Pozzati**	

Statement - dichiarazione**:** *This is to certify that all tests have been conducted in accordance with the order/ specification / test programme. The results relate to the samples tested and have been accurately recorded in the test report given under the Testlab Manager authority. This report shall not be reproduced without the written approval of the laboratory- Questo per dichiarare che tutte le prove sono state effettuate in accordo agli ordini / norme / programmi di prova. I risultati sono relativi ai campioni sottoposti alle prove sono stati registrati in maniera accurata nel rapporto di prova distribuito sotto la supervisione del Responsabile del Laboratorio. Questo rapporto di prova non deve essere riprodotto senza il consenso scritto del Laboratorio.*

Test report approved by – rapporto di prova approvato da: **L. Marani**	

Test Laboratory Glenair Italia s.p.a.
Tel. +390516069915 / +390516069998
Email: pbrulatti@glenair.it

Description of samples – Descrizione dei campioni**:**

GROUP 1				
Serial number	**Part Number**	**Description**	**Shell Size**	**Photo**
005	790-024PB-2P2ML	Receptacle Cable Connector, 2 Pin	B	
006	790-027SB-2P2MEP	Plug Rear Panel MT. Connector, 2 socket	B	

GROUP 2				
Serial number	**Part Number**	**Description**	**Shell Size**	**Photo**
007	790-024PG-33ML	Receptacle Cable Connector, 33 Pin	G	
008	790-025SG-33EMP	Plug Cable Connectors, 33 Socket	G	
009	790-025SF-5P5EML	Plug Cable Connectors, 5 Socket	F	

010	790-026PF-5P5MP	Receptacle Rear Panel MT. Connector, 5 Pin	F	
011	790-024PE-11P2ML	Receptacle Cable Connector, 11 Pin	E	
012	790-037SE-11P2MEPA	Plug R/A PCB MT. Rear Panel MT. 11 socket	E	

GROUP 3				
Serial number	**Part Number**	**Description**	**Shell Size**	**Photo**
015	790-024PA-5ML	Receptacle Cable Connector, 5 Pin	A	
016	790-025SA-5EMP	Plug Cable Connector, 5 Socket	A	
017	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	

018	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	
019	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
020	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	
021	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
022	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	
023	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
024	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	
025	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	

				
026	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	 
027	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
028	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	 
029	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
030	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	 
031	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
032	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	 

033	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
034	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	 
035	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	
036	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	 

GROUP 4				
Serial number	**Part Number**	**Description**	**Shell Size**	**Photo**
037	90-041PK-9P9MPA	Receptacle R/A PCB MT. 9 Pin	K	
038	790-043PJ-25P2MPA	Receptacle Vertical MT. PCB 25 Pin	J	
039	790-025SK-9P9EMS	Plug Cable Connector, 9 Socket	K	 
040	790-025SJ-25P2NMS	Plug Cable Connector, 25 Socket	J	 

Scope of test – Scopo delle prove**:**

The scope of this report is to validate the series 79 Glenair connectors.

Conclusions / Outcome – Conclusioni / esito**:**

Paragraph - Paragrafo	**List of tests –** lista delle prove:	**Conclusions / Outcome** – Conclusioni / esito**:**
Group 1		
1	Visual and Mechanical Examination	PASS
2	Magnetic Permeability	PASS
3	Temperature Cycling	PASS
4	Durability	PASS
5	Altitude Immersion	PASS
	Insulation Resistance	
	Dielectric Withstanding Voltage	
6	Insert Retention	PASS
7	Shell-to-shell Conductivity	PASS
8	Salt Spray	PASS
9	Shell-to-shell Conductivity	PASS
10	Post Test Examination	PASS
Group 2		
11	Visual and Mechanical Examination	PASS
12	Mating and Un-mating Force	PASS
13	Contact Retention	PASS
14	Altitude – Low Temperature	PASS
	Insulation Resistance	PASS
	Dielectric Withstanding Voltage	PASS
15	Insulation Resistance	PASS
16	Durability	PASS
17	Vibration	PASS
	Sine Vibration	PASS
	Random Vibration	PASS
	Shock	PASS
18	Shell-to-shell Conductivity	PASS

19	Humidity	PASS
	Insulation Resistance	
	Dielectric Withstanding Voltage	
20	Post Test Examination	PASS
Group 3		
21	Visual and Mechanical Examination	PASS
22	Water Immersion	PASS
23	Mating and Un-mating Force	PASS
24	Fluid Immersion	PASS
	Dielectric Withstanding Voltage	PASS
25	Post Test Examination	PASS
Group 4		
26	Visual and Mechanical Examination	PASS
27	Contact Resistance	PASS
28	Low Level Contact Resistance	PASS
29	Current Rating	PASS
30	Solderability	PASS
31	Resistance to Solder Heat	PASS
	Insulation Resistance	PASS
32	Post Test Examination	PASS

Date of receipt of samples – Data di ricezione campioni**: 18/08/2015**

Paragraph - Paragrafo	**List of tests –** lista delle prove:	**Standard / specification applicable –** norme / specifiche applicabili	**Testlab procedure cross – reference –** Procedura Testlab
Group 1			
1	Visual and Mechanical Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
2	Magnetic Permeability(*)	EIA-364-54 / QTP-406 Preliminary 3	--

Paragraph - Paragrafo	**List of tests –** lista delle prove:	**Standard / specification applicable –** norme / specifiche applicabili	**Testlab procedure cross – reference –** Procedura Testlab
3	Temperature Cycling	EIA-364-32 / QTP-406 Preliminary 3	TLP 025 Rev. 5
4	Durability(*)	EIA-364-32 / Iec-60512-5 / QTP-406 Preliminary 3	--
5	Altitude Immersion(*)	EIA-364-03 / QTP-406 Preliminary 3	--
	Insulation Resistance	EIA-364-21 / QTP-406 Preliminary 3	TLP 017 Rev. 2
	Dielectric Withstanding Voltage	EIA-364-20 / QTP-406 Preliminary 3	TLP 020 Rev. 3
6	Insert Retention(*)	EIA-364-35 / QTP-406 Preliminary 3	TLP 024 Rev. 1
7	Shell-to-shell Conductivity	EIA-364-83 / QTP-406 Preliminary 3	TLP 015 Rev. 2
8	Salt Spray	EIA-364-26 / QTP-406 Preliminary 3	TLP 001 Rev. 2
9	Shell-to-shell Conductivity	EIA-364-83 / QTP-406 Preliminary 3	TLP 015 Rev. 2
10	Post Test Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
Group 2			
11	Visual and Mechanical Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
12	Mating and Un-mating Force(*)	EIA-363-13 / QTP-406 Preliminary 3	--
13	Contact Retention(*)	EIA-364-29 / QTP-406 Preliminary 3	TLP 023 Rev. 1
14	Altitude – Low Temperature	EIA-364-105 / QTP-406 Preliminary 3	--
	Insulation Resistance	EIA-364-21 / QTP-406 Preliminary 3	TLP 017 Rev. 2
	Dielectric Withstanding Voltage	EIA-364-20 / QTP-406 Preliminary 3	TLP 020 Rev. 3
15	Insulation Resistance	EIA-364-21 / QTP-406 Preliminary 3	TLP 017 Rev. 2
16	Durability(*)	EIA-364-32 / Iec-60512-5 / QTP-406 Preliminary 3	--
17	Vibration	QTP-406 Preliminary 3	--

Paragraph - Paragrafo	**List of tests –** lista delle prove:	**Standard / specification applicable –** norme / specifiche applicabili	**Testlab procedure cross – reference –** Procedura Testlab
	Sine Vibration	QTP-406 Preliminary 3	--
	Random Vibration	EIA-364-28 / QTP-406 Preliminary 3	--
	Shock	EIA-364-27 / QTP-406 Preliminary 3	--
18	Shell-to-shell Conductivity	EIA-364-83 / QTP-406 Preliminary 3	TLP 015 Rev. 2
19	Humidity	EIA-364-31 / QTP-406 Preliminary 3	TLP 004 Rev. 7
	Insulation Resistance	EIA-364-21 / QTP-406 Preliminary 3	TLP 017 Rev. 2
	Dielectric Withstanding Voltage	EIA-364-20 / QTP-406 Preliminary 3	TLP 020 Rev. 3
20	Post Test Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
Group 3			
21	Visual and Mechanical Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
22	Water Immersion(*)	MIL-STD-810F / QTP-406 Preliminary 3	TLP 013 Rev. 2
23	Mating and Un-mating Force(*)	QTP-406 Preliminary 3	--
24	Fluid Immersion(*)	EIA-364-10 / QTP-406 Preliminary 3	--
	Dielectric Withstanding Voltage	EIA-364-20 / QTP-406 Preliminary 3	TLP 020 Rev. 3
25	Post Test Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
Group 4			
26	Visual and Mechanical Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--
27	Contact Resistance	EIA-364-06 / QTP-406 Preliminary 3	TLP 018 Rev. 2
28	Low Level Contact Resistance	EIA-364-23 / QTP-406 Preliminary 3	--
29	Current Rating	EIA-364-70 / QTP-406 Preliminary 3	TLP 014 Rev. 7
30	Solderability(*)	EIA-364-52 / IEC-60512-12-1 / IEC-68-2-20 /	--

Paragraph - Paragrafo	**List of tests –** lista delle prove:	**Standard / specification applicable –** norme / specifiche applicabili	**Testlab procedure cross – reference –** Procedura Testlab
		QTP-406 Preliminary 3	
31	Insulation Resistance after solderability	EIA-364-21 / QTP-406 Preliminary 3	TLP 017 Rev. 2
32	Resistance to Solder Heat(*)	EIA-364-56 / IEC-60512-12-5 / QTP-406 Preliminary 3	--
	Insulation Resistance after resistance to solder heat	EIA-364-21 / QTP-406 Preliminary 3	TLP 017 Rev. 2
33	Post Test Examination(*)	MIL-STD-1285 / QTP-406 Preliminary 3	--

(*) Tests out of the laboratory scope of approval

Comments / remarks – commenti / osservazioni**:**

GROUP 1

1. Visual and Mechanical Examination

1.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The connectors shall be visually and mechanically examined to ensure conformance with the specification and the applicable military standards.

1.2. Items tested – Campioni sottoposti a prova

SN005, SN006

1.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
--	--	--	--	--

1.4. Requirement – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

1.5. Date and place of test – Data e luogo della prova

09/09/15– Glenair Italia TestLab – Environmental Test Room

1.6. Environmental conditions – Condizioni ambientali

Temperature: 29,2 °C
Humidity: 28,6 %

1.7. Result – Risultati

Sample	Result
SN 005	OK; no defects detected
SN 006	OK; no defects detected

1.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

2. Magnetic Permeability

2.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Connector shall be tested in accordance with test procedure EIA-364-54.

2.2. Items tested – Campioni sottoposti a prova

SN005, SN006

2.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Permeability Indicator	PI01	7843	Severn Engineering co. / 7843	03/16

2.4. Requirement – Requisiti

The relative permeability of the wire, assembled, and fully mated connector assembly shall be less than 2.0 µ.

2.5. Date and place of test – Data e luogo della prova

09/09/15– Glenair Italia TestLab – Environmental Test Room

2.6. Environmental conditions – Condizioni ambientali

Temperature: 29,2 °C
Humidity: 28,6 %

2.7. Result – Risultati

Sample	Result
SN 005	OK; relative permeability is lower than 2.0 µ
SN 006	OK; relative permeability is lower than 2.0 µ

2.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

3. Temperature Cycling

3.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Unmated connectors shall be subjected to 5 temperature cycles per EIA-364-32 test condition I Method A from -65°C to 150°C.

3.2. Items tested – Campioni sottoposti a prova

SN005, SN006

3.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Oven	FO16	32111	Fratelli Galli / G-2100	07/16
Refrigerator	FR1	PR 85C 4234	Angelantoni / PR 85 C	09/15

Thermometer	TC-08-02	AO012/310	Pico Technology / TC08	05/16
Thermocouple	TC01-2	--	RS762-1124 / T thermocouple	06/16
Thermocouple	TC03-2	--	RS762-1124 / T thermocouple	06/16

3.4. **Requirement** – Requisiti

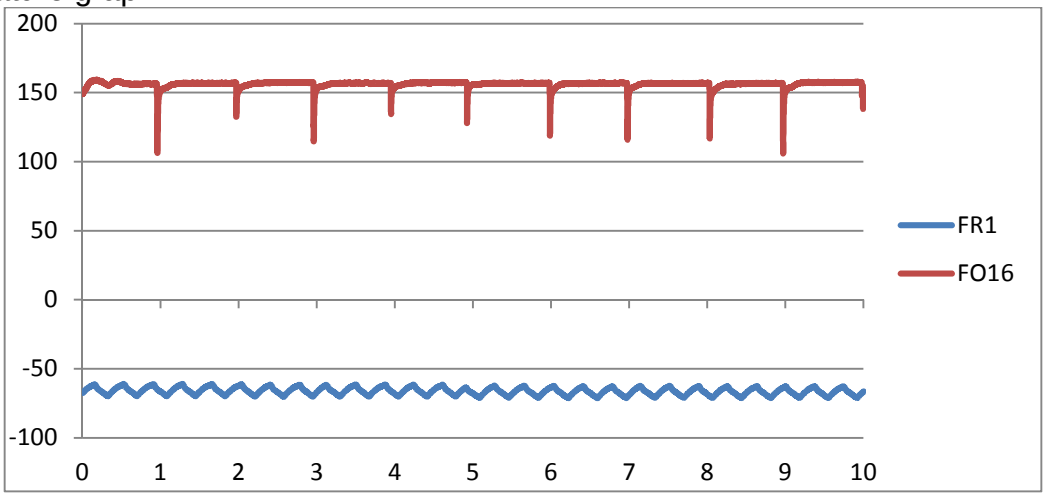
When tested, there shall be no damage detrimental to the operation of the connector.

3.5. **Date and place of test** – Data e luogo della prova

11/09/15– Glenair Italia TestLab – Environmental Test Room

3.6. **Environmental conditions** – Condizioni ambientali

Temperature graph:



3.7. **Result** – Risultati

There are not mechanical damages that affect the functionality of the connectors.

3.8. **Comments / remarks** – commenti / osservazioni

The samples are in compliance with the specification.

4. Durability

4.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Connector shall be tested in accordance with EIA-32, IEC-60512-5 test 9a. The wired, assembled plugs and receptacles shall be mated and unmated 500 cycles. The mating and un-mating shall be accomplished so that the plug and receptacle are completely separated during each cycle.

4.2. Items tested – Campioni sottoposti a prova

SN005, SN006

4.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
--	--	--	--	--

4.4. Requirement – Requisiti

When tested, there shall be no damage detrimental to the operation of the connector and shall meet the subsequent test requirements.

4.5. Date and place of test – Data e luogo della prova

12/10/15– Glenair Italia TestLab – Environmental Test Room

4.6. Environmental conditions – Condizioni ambientali

Temperature: 29,0 °C
Humidity: 34,9 %

4.7. Result – Risultati

There are not mechanical damages that affect the functionality of the connectors.

4.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

5. Altitude Immersion

5.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Mated connector shall be tested in accordance with test procedure EIA-364-03. The following details shall apply:

- All wire ends shall be located within the chamber and exposed to the chamber atmosphere but not submerged or sealed.
- Maximum wire size shall be used

Contact size	Wire to be loaded in connector
23	M22759/10-24
16	M22759/8-16
12	M22759/8-12

- At the end of the third cycles while the connectors are still submerged in the solution, the insulation resistance at ambient temperature and the dielectric withstanding voltage shall be measured.

5.2. Items tested – Campioni sottoposti a prova

SN005, SN006

5.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Megaohmmetro	R7	1004308	Sefelec M1501M	10/16

Dieletric breakdown tester	UH28CS/2	20230109100182	Etl-Prueftechnik/ UH28CS	03/16
Low pressure chamber	DEP1	M1732	Vuototest / Mazzali System	09/17

5.4. Requirement – Requisiti

When tested, the mated connector pair shall have a minimum insulation > 1000 MΩ and dielectric withstanding voltage I leakage < 2 mA

5.5. Date and place of test – Data e luogo della prova

16/10/15– Glenair Italia TestLab – Environmental Test Room

5.6. Environmental conditions – Condizioni ambientali

Temperature: 25,2 °C
Humidity: 35,5 %

5.7. Result – Risultati

SN005 mated with SN006		
PIN	**IR**	**D.W.V.**
1	67,2 TΩ	OK, I leakage =0,1 mA
2	146,3 GΩ	OK, I leakage =0,1 mA

5.8. Comments / remarks – Commenti / osservazioni

Samples SN005 and SN006 are in compliance with the specification.

6. Insert Retention

6.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Unmated connectors shall be tested in accordance with test procedure EIA-364-35:

- Force to be applied: 25 pounds minimum at rate of 10 PSI/sec.

- Wire contacts can be removed for convenience of testing.

6.2. Items tested – Campioni sottoposti a prova

SN005, SN006

6.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Dynamometer	DIN9	U07744	Chatillon DFEMETEK	10/16
Height gauge meter	T6	03003086	Mitutoyo HDS	08/16
Dial indicator	CO12	RQN999	Mitutoyo 2046S	09/16

6.4. Requirement – Requisiti

When tested, unmated connectors shall retain their insert in their proper location in the shell and there shall be no evidence of cracking, breaking, separation from the shell, or loosening of parts.

6.5. Date and place of test – Data e luogo della prova

16/10/15– Glenair Italia TestLab – Environmental Test Room

6.6. Environmental conditions – Condizioni ambientali

Temperature: 25,2 °C
Humidity: 35,5 %

6.7. Result – Risultati

Insert retention		
Sample	**Force (N)**	**Displacement (mm)**
SN005	112	0,02
SN006	112	0,04

6.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

7. Shell-to-shell Conductivity

7.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Mated connectors shall be tested in accordance with test procedure EIA-364-83.

7.2. Items tested – Campioni sottoposti a prova

SN005, SN006

7.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Power supply	GC1	60782	Toellner / TOE8872	07/16
Voltmeter	NV01	MY42002275	Agilent / 34420A	04/16

7.4. Requirement – Requisiti

When tested probes shall not puncture or otherwise damage the connector finish and the maximum measured potential drop across assemblies shall be 2,5 mV for plugs with spring fingers.

7.5. Date and place of test – Data e luogo della prova

21/12/15– Glenair Italia TestLab – Electrical Test Room

7.6. Environmental conditions – Condizioni ambientali

Temperature: 25,0 °C
Humidity: 32,7 %

7.7. Result – Risultati

Shell-to-shell conductivity	
Sample	**Measure (mV)**
SN005 mated with SN006	2,48

7.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

8. Salt Spray

8.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Mated connectors shall be tested in accordance with test procedure EIA-364-26, IEC-60512-11-6, with 5% salt solution at 35°C for 48 hours.

8.2. Items tested – Campioni sottoposti a prova

SN005, SN006

8.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura

PHmetro	PH04	HI 98127	Hanna / HI98127	06/16
Salt spray chamber	DCTC600P	TT 01512	Angelantoni / DCTC600P	06/16

8.4. Requirement – Requisiti

When tested, unmated connectors shall show no lifting of plated coating or exposure of basis material under three power (3X magnification).

8.5. Date and place of test – Data e luogo della prova

From 21/12/15 to 23/12/15 – Glenair Italia TestLab – Salt spray chamber

8.6. Environmental conditions – Condizioni ambientali

Chamber temperature: 35°C
Water specific gravity: 1,036 to 1,038
Flow: 1,36- 1,47 ml\hour
PH: 6,6

8.7. Result – Risultati

Samples are in compliance with the specification.

8.8. Comments / remarks – Commenti / osservazioni

SN006 show exposure of base material.
SN005 is in compliance with the specification.

9. Shell-to-shell Conductivity

9.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Mated connectors shall be tested in accordance with test procedure EIA-364-83.

9.2. Items tested – Campioni sottoposti a prova

SN005, SN006

9.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Power supply	GC1	60782	Toellner / TOE8872	07/16
Voltmeter	NV01	MY42002275	Agilent / 34420A	04/16

9.4. Requirement – Requisiti

When tested probes shall not puncture or otherwise damage the connector finisch and the maximum measured potential drop across assemblies shall be 2.5 mV for plugs with spring fingers.

9.5. Date and place of test – Data e luogo della prova

11/01/16– Glenair Italia TestLab – Electrical Test Room

9.6. Environmental conditions – Condizioni ambientali

Temperature: 23,2 °C
Humidity: 34,5 %

9.7. Result – Risultati

Shell-to-shell conductivity	
Sample	**Measure (mV)**
SN005 mated with SN006	1,43

9.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

10. Post Test Examination

10.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The tested connectors and contacts shall be examined to determine the effects of previous testing. Any evidence of cracking, loosening of parts, carbon tracking, excess wear, or missing parts shall be recorded.

10.2. Items tested – Campioni sottoposti a prova

SN005, SN006

10.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
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10.4. Requirement – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

10.5. Date and place of test – Data e luogo della prova

11/01/16– Glenair Italia TestLab – Environmental Test Room

10.6. Environmental conditions – Condizioni ambientali

Temperature: 23,2 °C
Humidity: 34,5 %

10.7. Result – Risultati

Sample	Result
SN 005	OK
SN 006	OK

10.8. Comments / remarks – commenti / osservazioni

SN005 is in compliance with the specification.
SN006 is in compliance with the specification.

GROUP 2

11. Visual and Mechanical Examination

11.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The connectors shall be visually and mechanically examined to ensure conformance with the specification and the applicable military standards.

11.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

11.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
--	--	--	--	--

11.4. Requirement – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code

symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

11.5. **Date and place of test** – Data e luogo della prova

21/09/15– Glenair Italia TestLab – Environmental Test Room

11.6. **Environmental conditions** – Condizioni ambientali

Temperature: 26,8 °C
Humidity: 39,6 %

11.7. **Result** – Risultati

Sample	Result
SN 007	OK; no defects detected
SN 008	OK; no defects detected
SN 009	OK; no defects detected
SN 010	OK; no defects detected
SN 011	OK; no defects detected
SN 012	OK; no defects detected

11.8. **Comments / remarks** – commenti / osservazioni

The samples are in compliance with the specification.

12. Mating and Un-mating Force

12.1. **Description of Test method procedure** – Descrizione della procedura del metodo di prova

Mated connectors shall meet the requirements of table.

Axial Force (LSB)	
MAX. Mating Force	**MIN. Unmating Force**
(6LBS for Ground Spring) + (Number of 23 Gauge Contacts x 0.50 LBS) + (Number of 16 Gauge Contacts x 1.88 LBS) + (Number of 12 Gauge Contacts x 1.88 LBS) = Total Mating Force	(3LBS for Ground Spring) + (Number of 23 Gauge Contacts x 0.047 LBS) + (Number of 16 Gauge Contacts x 0.125 LBS) + (Number of 12 Gauge Contacts x 0.125 LBS) = Total Unmating Force

The rate of mating and unmating shall be 1 to 10 cycles per minute

12.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

12.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Dynamometer	DIN6	T06372	Chatillon DFEMETEK 200	10/16

12.4. Requirement – Requisiti

The force for mating and unmating of counterpart connectors shall be tested in accordance with test procedure EIA-363-13. The connectors used in this test shall have the complement of contacts.

12.5. Date and place of test – Data e luogo della prova

21/09/15– Glenair Italia TestLab – Environmental Test Room

12.6. Environmental conditions – Condizioni ambientali

Temperature: 26,8 °C
Humidity: 39,6 %

12.7. Result – Risultati

Sample	Mating (N)		Un-mating (N)	
	Max Requirement	Measured	Min Requirement	Measured
SN007 mated with SN008	100,1	53	82,33	40
SN009 mated with SN010	160,5	37,6	22,24	20,5
SN011 mated with SN012	63,4	42,5	33,28	23,5

12.8. Comments / remarks – commenti / osservazioni

Samples pass the test.

13. Contact Retention

13.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Contact retention shall be tested in accordance with test procedure EIA-364-29.
The following details and exceptions shall apply:

- The test shall be performed on 20 percent of the contact complement; but not less than three contacts in each connector half.
- Preload to 13.6 N maximum. Apply load as specified in table

Contact Size	Load ± 10 Pecent	
	Min. Pounds	Min. Newtons
23	6	27
20	15	67
16	25	111
12	25	111

- The applicable forces shall be applied along the longitudinal axis of individual contacts in the direction tending to displace the contacts to the rear.
- Only the contacts to be tested need be installed in the connector.

13.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

13.3. **Relevant equipment** – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Dynamometer	DIN3	C35291	Chatillon DFE 100	09/17
Dynamometer	DIN6	T06372	Chatillon DFEMETEK 200	10/16
Height gauge meter	T6	03003086	Mitutoyo HDS	08/16
Dial indicator	CO12	RQN999	Mitutoyo 2046S	09/16

13.4. **Requirement** – Requisiti

When tested, the axial displacement of the contact shall not exceed 0,30 mm. No damage to contacts or inserts shall result.

13.5. **Date and place of test** – Data e luogo della prova

21/09/15 – 22/09/15 – Glenair Italia TestLab – Environmental Test Room

13.6. **Environmental conditions** – Condizioni ambientali

21/09/15
Temperature: 27,4 °C
Humidity: 38,1 %

22/09/15
Temperature: 27,0 °C
Humidity: 35,9 %

13.7. **Result** – Risultati

SN007		
PIN	**FORCE (N)**	**Displacement (mm)**
1	30,55	0,09
2	32,7	0,18
3	29,65	0,09
4	32,9	0,12
5	30,85	0,02
6	32,6	0,10
7	30,15	0,09

SN008		
PIN	**FORCE (N)**	**Displacement (mm)**
1	27,3	0,20
2	27,35	0,29
3	27,5	0,07
4	33,2	0,11
5	28,25	0,10
6	32,25	0,18
7	27,4	0,19

SN009		
PIN	**FORCE (N)**	**Displacement (mm)**
A1	118	0,20
A3	123	0,25
A5	128	0,23

SN010		
PIN	**FORCE (N)**	**Displacement (mm)**
A1	111	0,24
A3	120	0,21
A5	119	0,20

SN011		
PIN	**FORCE (N)**	**Displacement (mm)**
1	27,8	0,13
2	29,3	0,28
8	30,2	0,23
A1	113	0,20
A2	114	0,23

SN012		
PIN	**FORCE (N)**	**Displacement (mm)**
1	27,25	0,06
2	27,7	0,07

8	27,5	0,06
A1	115	0,06
A2	123	0,08

13.8. **Comments / remarks** – Commenti / osservazioni

The samples are in compliance with the specification.

14. Altitude – Low Temperature

GLENAIR UK LTD
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OAKHAM BUSINESS PARK
MANSFIELD
NOTTS. NG18 5BY

T3003 IECQ-CECC

TEST REPORT No. 38-1015

TEST REPORT TITLE
QTP-406 Group 2 Qualification Testing of Glenair Series 79 Micro-Crimp Connectors.

CLIENT
Glenair Italia S.p.A, Via Del Lavoro, 7 Quarto Inferiore - 40057 Granarolo dell Emiia, Bologna, Italy.

TESTING CONDUCTED BY: G.Forrest

REPORT COMPILED BY: G.Forrest

REPORT APPROVED BY: A.Coulson

This is to certify that all tests have been conducted in accordance with the order/specification/test programme. The results relate to the samples tested and have been accurately recorded in the test report given under my authority.This report shall not be reproduced without the written approval of the laboratory.

ISSUE DATE: 24/11/15

DISTRIBUTION: Glenair Italia S.p.A

QD30 revD

Object of Test.

To conduct Altitude / Low Temperature testing on QTP-406, Group 2 samples as part of the overall qualification test program carried out by Glenair Italy.

Sample Details.

		Group 2	
Ser No	Part No	Description	Shell Size
7	790-024PG-33ML	Cable Receptacle, 33 way pin.	G
8	790-025SG-33EMP	Cable Plug, 33 way Socket.	G
9	790-025SF-5P5EML	Cable Plug, 5 way Socket.	F
10	790-026PF-5P5MP	Panel Mount Rec, 5 way.	F
11	790-024PE-11P2ML	Cable Receptacle, 11 way pin.	E
12	790-037SE-11P2MEPA	PCB mount, 11 way Socket.	E

Test Specifications.

QTP-406 Rev 4.
EIA-364, various.

Test Equipment.

Description	S/No	Cal Date	Application
Safelec Insulation Tester.	M-24	Nov'14	Insulation Resistance.
Megger HiPot Breakdown Tester.	M-2	Jan'15	Voltage Proof.
Thermotron Climatic Chamber.	C-10	Sept'14	Altitude Low Temp.
Altitude Chamber & Accessories.	V-3	April'15	Altitude / Low Temp.
Agilent DMM.	M-27	June'14	Voltage Measurement.
Pico TC-08 temperature recorder.	TR-17	March '15	Temperature Measurement.

Test Method.

QTP-406 para 3.18 & 4.4.16

Altitude - Low Temperature. Wired, mated samples were tested to the requirements of EIA-364-105, with reference to the test details given in QTP-406, preliminary revision 4. For the purposes of conducting Insulation Resistance measurements and Dielectric Withstand Voltage tests, all contacts were divided into 2 groups of alternate contacts, the measurement being taken between groups, the connector shell being connected to the negative.
Connection to the exterior of the Altitude chamber was via vacuum feedthrough. Exposed PCB solder tails were protected by means of moulded DC170 Silicon Elastomer compound, no backshells were fitted.
Each mated sample pair was individually tested in the following sequence :-

1) Samples were preconditioned at 50°C for a minimum period of 8 hours and allowed to cool to ambient.

2) Each sample in turn was placed into a High Altitude / Vacuum chamber capable of being cooled to -65°C, the pressure first being reduced to 11 mbar (100,000 ft equivalent). This pressure and temperature was then maintained until the temperature stabilized at less than -61°C as measured by thermocouple within the Altitude chamber (see figure 1).

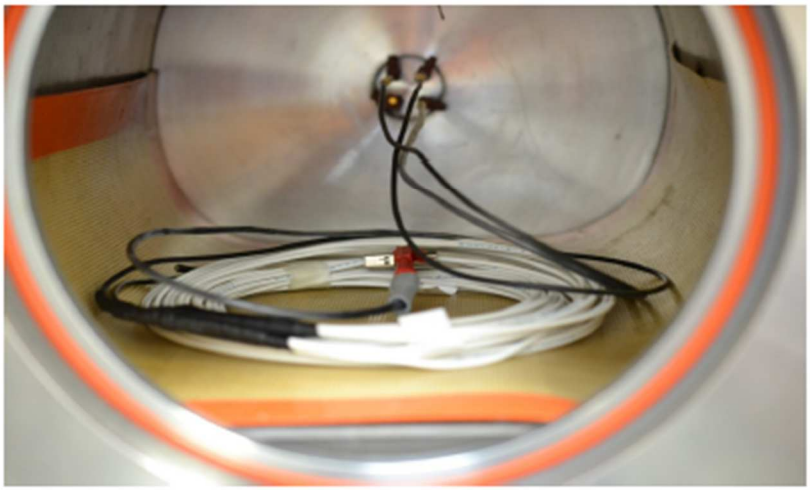

Figure 1 - Sample in position within Altitude chamber, also showing electrical feedthrough in rear of chamber.

Test Method (continued).

QTP-406 para 3.18 & 4.4.16

3) Once stabilized at -65°C and 11 mb pressure, the Insulation Resistance of the sample was measured at 500V as specified in EIA-364-21. After the Insulation Resistance measurement the pressure and temperature were allowed to increase to -55°C and 141.2 Torr (187.5 mb, 40,000 feet equivalent) and stabilize.

4) After stabilization at -55°C and 141.2 Torr (187.5 mb, 40,000 feet equivalent), a Dielectric Withstand Voltage test was carried out at 450V_{rms}, the voltage being applied for 1 minute between all contacts and shell. The current trip level was set to 2mA maximum.

5) After completion the samples were returned to ambient conditions and allowed to stabilize before being tested for Dielectric Withstand Voltage at 750Vrms, applied for 1 minute.
Insulation Resistance measurements at 500V were also taken at this time.

Test Results.

Sample No (mated pair). Result

7/8

Insulation Resistance @ 500V, applied for 1minute. $2 \times 10^{12}\Omega$
Alternate contacts and shell, pressure at 11mb,
Altitude chamber internal temperature -62.3deg C.

Dielectric Withstand Voltage @ $450V_{rms}$, 1 minute No breakdown or flashover.
application, all contacts to shell, pressure at 187mb,
Altitude chamber internal temperature -55.5deg C.

Return to Ambient Conditions.
Insulation Resistance @ 500V, applied for 1minute, $12.75 \times 10^{9}\Omega$
Alternate contacts and shell.
Dielectric Withstand Voltage @ $750V_{rms}$, 1 minute No breakdown or flashover.
application, all contacts to shell.

Date of Test 10/11/2015

Sample No (mated pair).

9/10

Insulation Resistance @ 500V, applied for 1minute. $2 \times 10^{12}\Omega$
Alternate contacts and shell, pressure at 11mb,
Altitude chamber internal temperature -61.1deg C.

Dielectric Withstand Voltage @ $450V_{rms}$, 1 minute No breakdown or flashover.
application, all contacts to shell, pressure at 186mb,
Altitude chamber internal temperature -54.3deg C.

Return to Ambient Conditions.
Insulation Resistance @ 500V, applied for 1minute, $220.0 \times 10^{9}\Omega$
Alternate contacts and shell.
Dielectric Withstand Voltage @ $1800V_{rms}$, 1 minute No breakdown or flashover.
application, all contacts to shell.

Date of Test 11/11/2015

Test Results (continued)

Sample No (mated pair).		Result
11/12		
	Insulation Resistance @ 500V, applied for 1minute. Alternate contacts and shell, pressure at 12mb, Altitude chamber internal temperature -62.0deg C.	$2 \times 10^{12}\Omega$
	Dielectric Withstand Voltage @ $450V_{rms}$, 1 minute application, all contacts to shell, pressure at 187mb, Altitude chamber internal temperature -56.9deg C.	No breakdown or flashover.
	Return to Ambient Conditions.	
	Insulation Resistance @ 500V, applied for 1minute, Alternate contacts and shell.	$728 \times 10^{9}\Omega$
	Dielectric Withstand Voltage @ $750V_{rms}$, 1 minute application, all contacts to shell.	No breakdown or flashover.
	DWV #16 contacts only to shell @ $1800V_{rms}$	No breakdown or flashover.

Date of Test 13/11/2015

15. Insulation Resistance at elevated temperature

15.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Unmated connectors shall be tested in accordance ith test procedure EIA-364-21.

- The tolerance on the applied voltage shall be ± 10 percent.
- Applicable elevated temperature for 30 minutes: 150°C +5°C/-0°C
- Measurements shall be made while the connectors are still in the chamber at the specified temperature.

15.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

15.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Megaohmmetro	R7	1004308	Sefelec M1501M	10/16
Oven	FO16	32111	Fratelli Galli / G-2100	07/16
Thermometer	TC-08-02	AO012/310	Pico Technology / TC08	05/16
Thermocouple	TC01-2	--	RS762-1124 / T thermocouple	06/16

15.4. Requirement – Requisiti

When tested, the insulation resistance between any pair of contacts and between any contacts and the shell shall be greater than 5000 MΩ for environment resisting class connectors.

15.5. Date and place of test – Data e luogo della prova

04/12/15– Glenair Italia TestLab – Electrical Test Room

15.6. Environmental conditions – Condizioni ambientali

Temperature: 26,7 °C
Humidity: 34,2 %

15.7. Result – Risultati

SN007 mated with SN008	
PIN	**IR before humidity**
1	358 GΩ
2	215 GΩ
3	325 GΩ
4	212 GΩ
5	302 GΩ
6	248 GΩ
7	191,2 GΩ
8	248 GΩ
9	218 GΩ
10	315 GΩ
11	369 GΩ
12	309 GΩ
13	227 GΩ
14	219 GΩ
15	205 GΩ
16	265 GΩ
17	305 GΩ
18	247 GΩ
19	187,3 GΩ
20	296 GΩ
21	287 GΩ
22	387 GΩ
23	227 GΩ
24	219 GΩ
25	206 GΩ
26	301 GΩ
27	198,8 GΩ
28	369 GΩ
29	327 GΩ
30	278 GΩ

31	250 GΩ
32	196,5 GΩ
33	228 GΩ

SN009 mated with SN010	
PIN	**IR before humidity**
1	79,3 GΩ
2	78,1 GΩ
3	63,6 GΩ
4	74,8 GΩ
5	65,8 GΩ

SN011 mated with SN012	
PIN	**IR before humidity**
A1	187,3 GΩ
A2	101,5 GΩ
1	198,6 GΩ
2	165,1 GΩ
3	185,9 GΩ
4	203 GΩ
5	208 GΩ
6	207 GΩ
7	214 GΩ
8	206 GΩ
9	248 GΩ

15.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

16. Durability

16.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Connector shall be tested in accordance with EIA-32, IEC-60512-5 test 9a. The wired, assembled plugs and receptacles shall be mated and unmated 500 cycles. The mating and unmating shall be accomplished so that the plug and receptacle are completely separated during each cycle.

16.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

16.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
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16.4. Requirement – Requisiti

When tested, there shall be no damage detrimental to the operation of the connector and shall meet the subsequent test requirements.

16.5. Date and place of test – Data e luogo della prova

09/12/15 - 10/12/15– Glenair Italia TestLab – Environmental Test Room

16.6. Environmental conditions – Condizioni ambientali

09/12/15
Temperature: 26,0 °C
Humidity: 23,8 %

10/12/15
Temperature: 27,0 °C
Humidity: 26,9 %

16.7. Result – Risultati

There are not mechanical damages that affect the functionality of the connectors.

16.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

17. Vibration, Sine Vibration, Random Vibration, Shock

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T3003 IECQ-CECC

TEST REPORT No. 13-0316

TEST REPORT TITLE

QTP-406 Group 2 Qualification Testing of Glenair Series 79 Micro-Crimp Connectors (Vibration & Shock).

CLIENT

Glenair Italia S.p.A, Via Del Lavoro, 7 Quarto Inferiore - 40057 Granarolo dell Emiia, Bologna, Italy.

TESTING CONDUCTED BY: G.Forrest

REPORT COMPILED BY: G.Forrest

REPORT APPROVED BY: A.Coulson

This is to certify that all tests have been conducted in accordance with the order/specification/test programme. The results relate to the samples tested and have been accurately recorded in the test report given under my authority. This report shall not be reproduced without the written approval of the laboratory.

ISSUE DATE: 08/03/16

DISTRIBUTION: Glenair Italia S.p.A

QD30 revD

Object of Test.

To conduct Vibration and Shock Testing on QTP-406, Group 2 samples as part of the overall qualification test program carried out by Glenair Italy.

Sample Details.

Ser No	Part No	Group 2 Description	Shell Size	Backshell
7	790-024PG-33ML	Cable Receptacle, 33 way pin.	G	799-015TMG04M01
8	790-025SG-33EMP	Cable Plug, 33 way Socket.	G	799-015TMG04M01
9	790-025SF-5P5EML	Cable Plug, 5 way Socket.	F	799-015TMF06N
10	790-026PF-5P5MP	Panel Mount Rec, 5 way.	F	799-016TME005N09
11	790-024PE-11P2ML	Cable Receptacle, 11 way pin.	E	799-015TME05N
12	790-037SE-11P2MEPA	PCB mount, 11 way Socket.	E	N/A

Test Specifications.

QTP-406 Preliminary 5.
EIA-364-27 Shock.
EIA-364-28 Vibration.

Test Equipment.

Description	S/No	Cal Date	Application
Tohnichi Torque Meter.	T-5	Sept'15	Tightening of locking screws etc
LDS V875 Vibration System.	VB-1A	N/A	
Endevco 7201-50 Accelerometer.	VB-4	Nov '15	Vibration Control.
Endevco 7201-50 Accelerometer.	VB-5	Nov '15	Vibration Control.
LDS CA4 Charge Amplifier.	VB-2	June '15	Signal Conditioning.
M+P VibPilot Vibration Controller.	VB-10	Dec '15	Vibration Control.
Picoscope Oscilloscope Module.	M-38	Oct '15	Discontinuity Monitoring.
Farnell Power Supply.	P-7	N/A	Discontinuity Monitoring.
Agilent Digital Multimeter.	M-27	July '15	Power Supply Set up.
Lansmont Model 65 Shock Machine.	VB-13	N/A	Calibrated before use.
Endevco 2226C Accelerometer.	VB-6	Nov '15	Shock Level Monitoring.
EE Charge Amplifier.	VB-9	Nov '15	Signal Conditioning.
Agilent Oscilloscope Module.	M-47	July '15	Shock Level Capture.
Mertronics DCM1012.	M-13	Sept '16	Discontinuity Monitoring.

Test Method.

QTP-406 para 3.19 & 4.4.17

Vibration. All group 2 samples, in accordance with EIA-364-28.
Each sample receptacle was mounted on a test fixture of the correct size using the relevent means provided, and tightened to 18 cNm and threadlocked, the samples were then engaged via jackscrews and tightened to 15 cNm (2-56UNC) or 20 cNm (4-40UNC). All contacts in each sample were then wired to form a single series circuit, after which backshells were fitted (where applicable), any securing screws being tightened to 15 cNm, with cable support / protection being provided at the cable exit where necessary. After assembly the mated samples were divided into two goups of 2 mated samples for either Random or Sinusoidal Vibration testing at the following levels.

4.4.17.1 Sine Vibration, Sample pairs 7/8 and 9/10.
Both samples were mounted onto a rectangular vibration jig by means of bolting the test fixtures to the jigging in one of 3 axes and subject to the following Sine Vibration levels.
Frequency Range - 10 to 2000Hz.
Velocity - 0.254 m/s between 10 to 50Hz.
Displacement - 1.5 mm peak to peak between 50 to 140Hz.
Acceleration - 60g from 140 to 2000Hz.
Duration - 10 to 2000Hz and return, 20 minutes, applied for 6hrs per axis, 18hr total.

4.4.17.2 Random Vibration, Sample pairs 11/12
Both samples were mounted onto a rectangular vibration jig by means of bolting the test fixtures to the jigging in one of 3 axes and subject to the following Random Vibration levels as given in EIA-364-28, condition VI, letter J.

Frequency	ASD
50 Hz	0.25 (g2/Hz)
100	1.0
2000	1.0

Overall 'g' 43.95 g_{rms}
Duration - 6 Hrs per axis, 18 hours total.

Continuity monitoring was applied throughout testing at 100mA via oscilloscope or by means of Digital Contact Monitor as specified in MIL-STD-202, Method 310, during both tests, for discontinuities of >1.0 µsec. Axis change was achieved by re-orientation of the samples on the vibration jigging.
Vibration control was via 2 accelerometers mounted on the vibration jigging, the inputs of which were averaged for control purposes (see figures 1 & 2).
Cable bundles were supported by means of clamps mounted off the vibration table at a minimum of 8" from the cable exit of the connectors.

Test Method (continued).

QTP-406 para 3.19 & 4.4.17

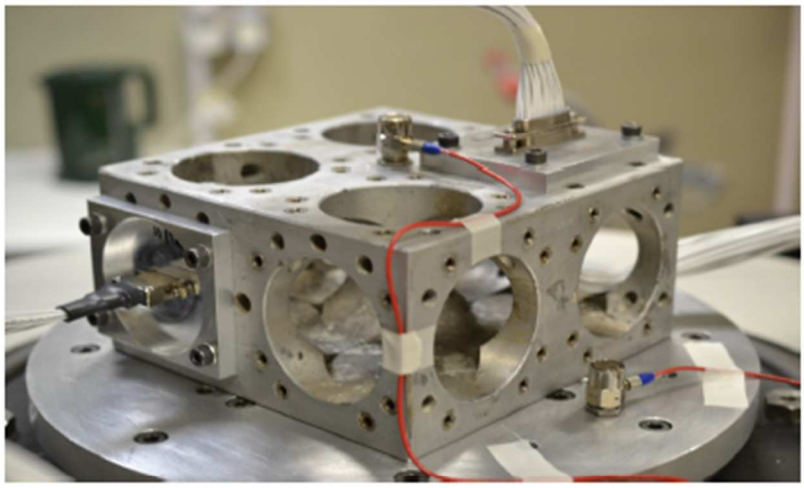


Figure 1 - Samples undergoing vibration (Random first Axis).

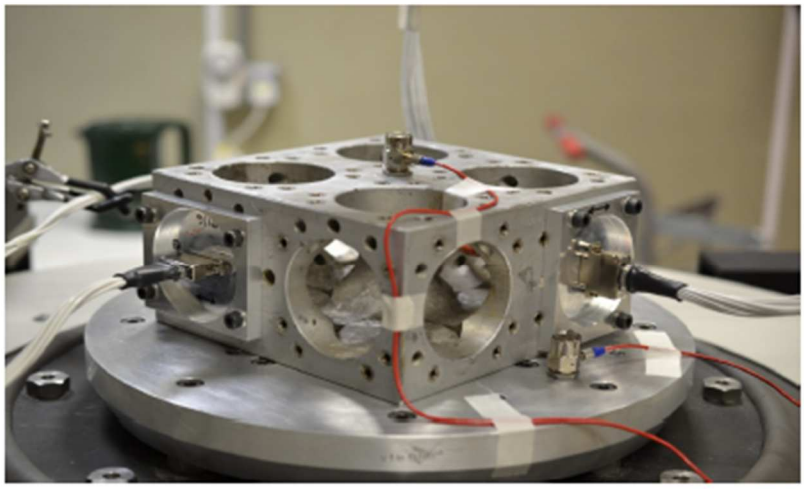


Figure 2 - Samples undergoing vibration (Sine third Axis).

Test Method (continued).

QTP-406 para 3.20 & 4.4.18

Shock. All group 2 samples in accordance with EIA-364-27.
While still mounted to the same test fixtures used for vibration and while still individually wired in series, all four samples were mounted onto the shock test fixture that had been previously configured to achieve the required levels.
Each series wired sample was then connected to a channel of the adjacent Digital Contact Monitor, to enable monitoring for discontinuities of >1.0 µsec.
All cable bundles were supported where possible at a minimum of 8" from the cable exit of the connectors by means of 'P' clips or tape to the shock test fixture.
When secure, the samples were subjected to shock testing at the following levels:-

Shock Type - Half Sine.
Amplitude - 300g peak ± 45g.
Duration - 3 msec ± 1 msec
No of Shocks - 3 Shocks in each direction of each axis (18 total).

Axis and direction change was achieved by re-orientation of the samples on the jigging. See figure 3

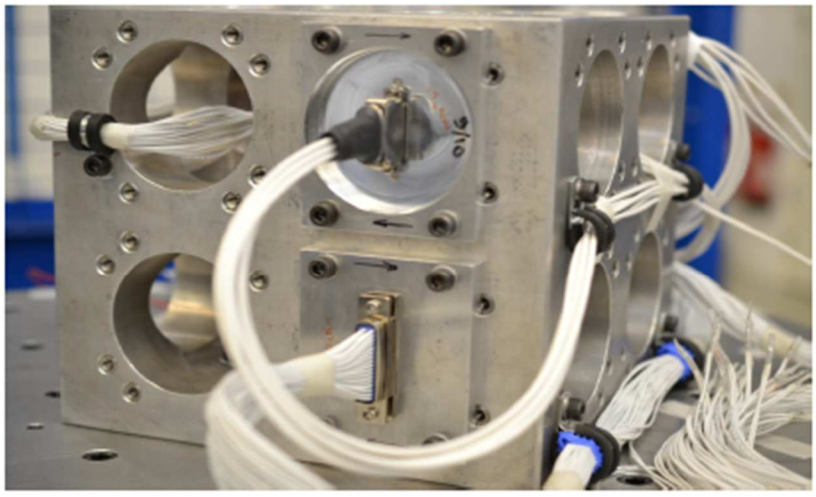


Figure 3 - Samples under going Shock testing (Axis 2).

Test Method (continued).

QTP-406 para 3.20 & 4.4.18

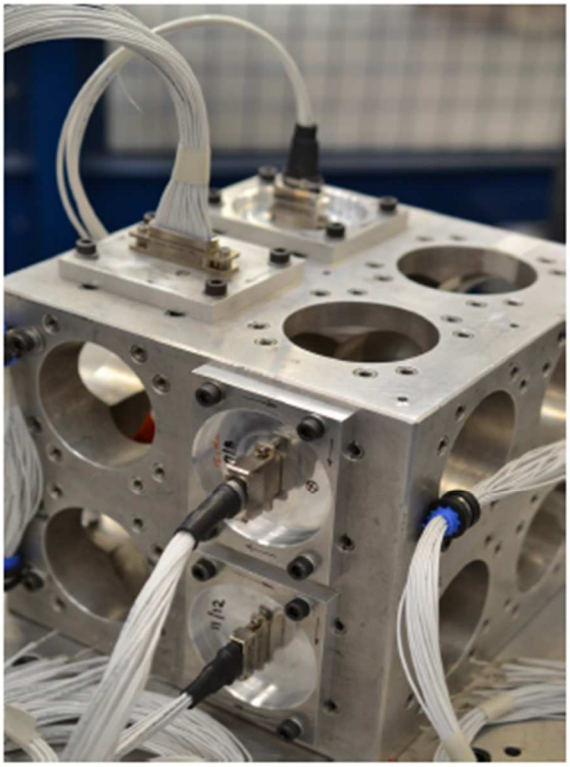
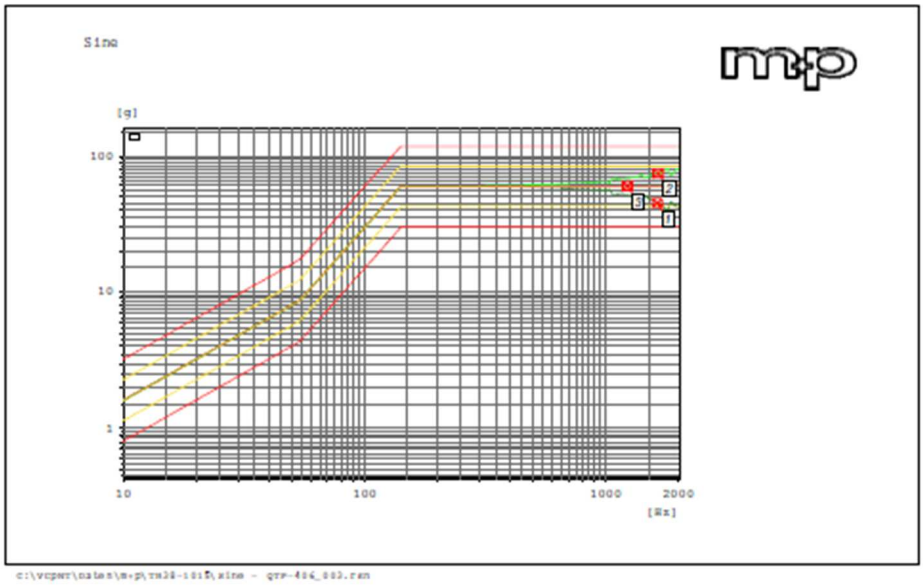


Figure 4 - Samples under going Shock testing (Axis 2).

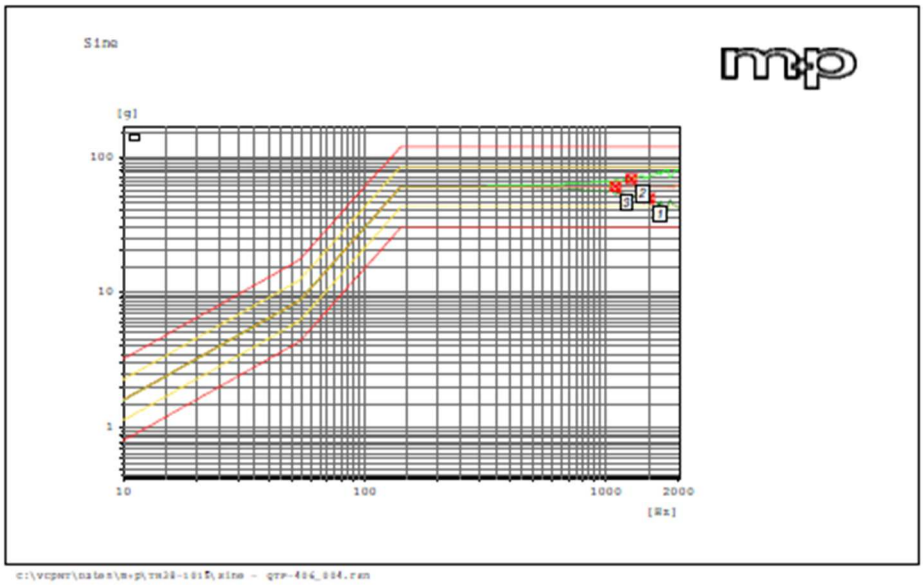
Upon completion of Shock and Vibration testing, all samples were visually examined for damage, cracking or loosening of components.

Test Results (continued).

Sinusoidal Vibration, Sample pairs 7/8 and 9/10.



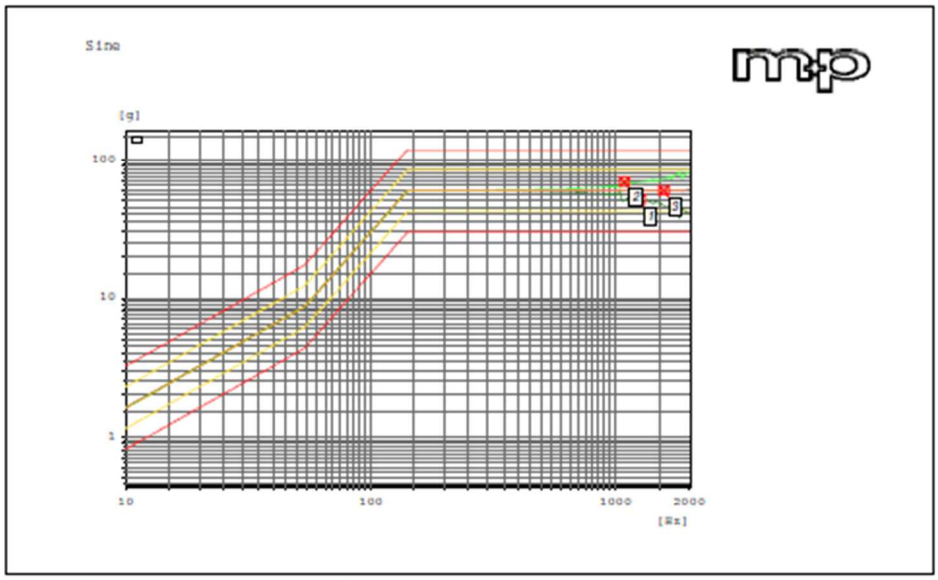
Axis 1 - Typical Sine Vibration plot, 1 & 2 accelerometers, 3 is the averaged control.



Axis 2 - Typical Sine Vibration plot, 1 & 2 accelerometers, 3 is the averaged control.

Test Results (continued).

Sinusoidal Vibration, Sample pairs 7/8 and 9/10.

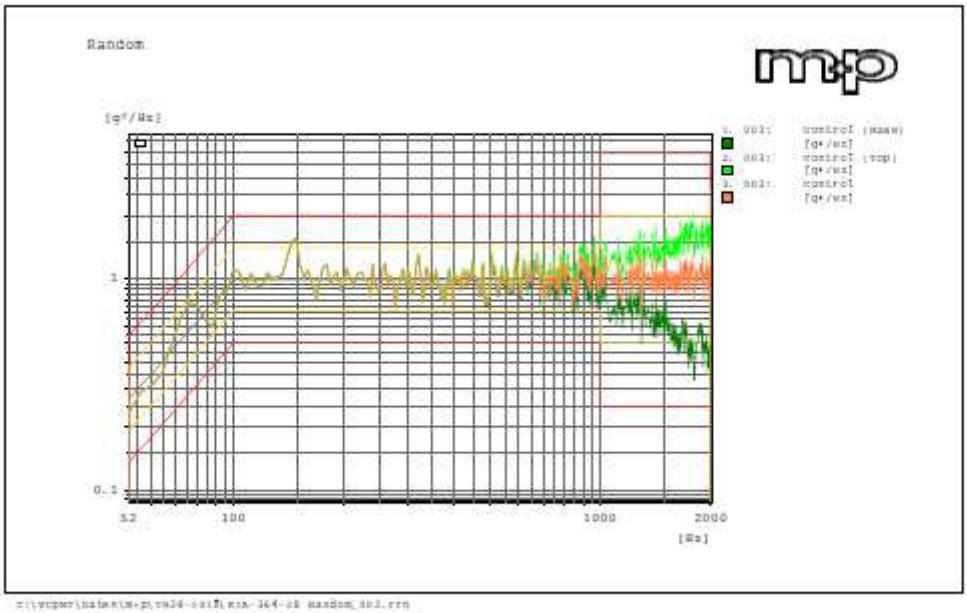


Axis 3 - Typical Sine Vibration plot, 1 & 2 accelerometers, 3 is the averaged control.

No visible damage or deterioration, no discontinuities detected of >1 µsec.

Test Results (continued).

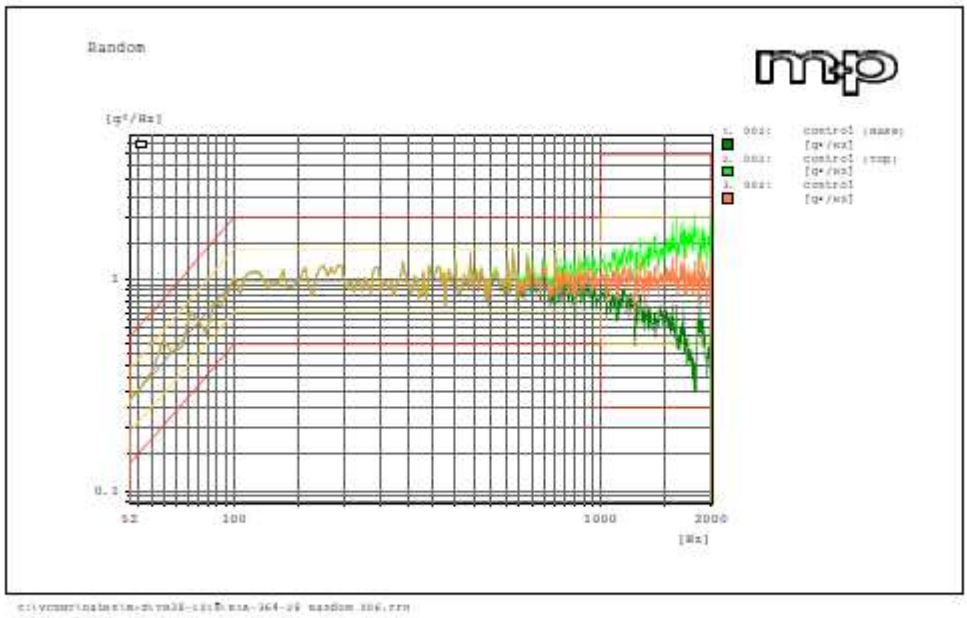
Random Vibration, Sample pairs 11/12



Axis 1 - Typical Random Vibration plot, 1 & 2 accelerometers, 3 (Orange) is the averaged control.

Test Results (continued).

Random Vibration, Sample pairs 11/12

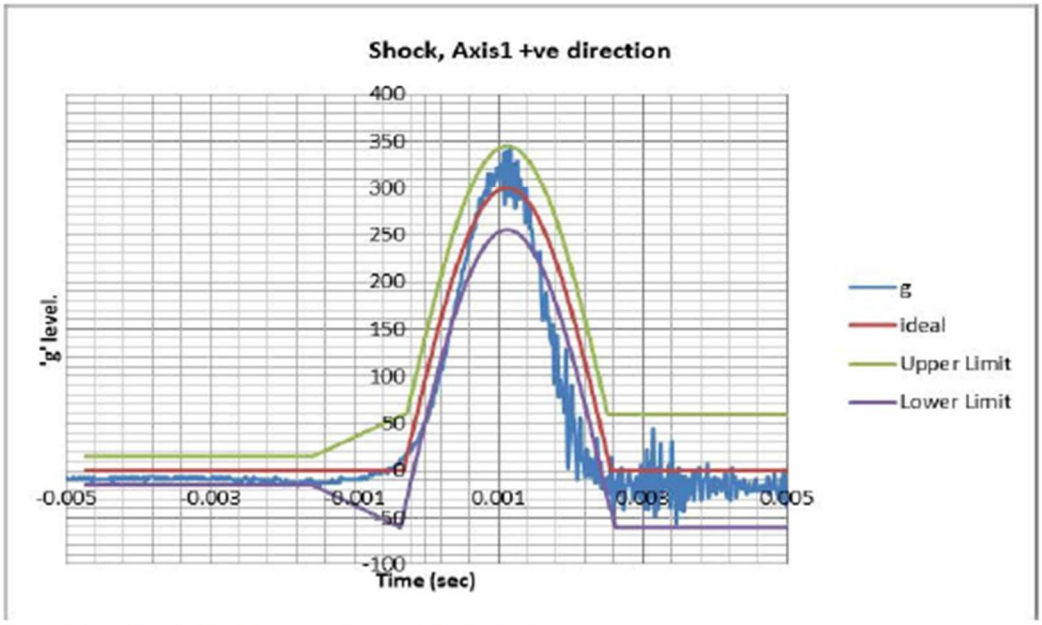


Axis 3 - Typical Random Vibration plot, 1 & 2 accelerometers, 3 (Orange) is the averaged control.

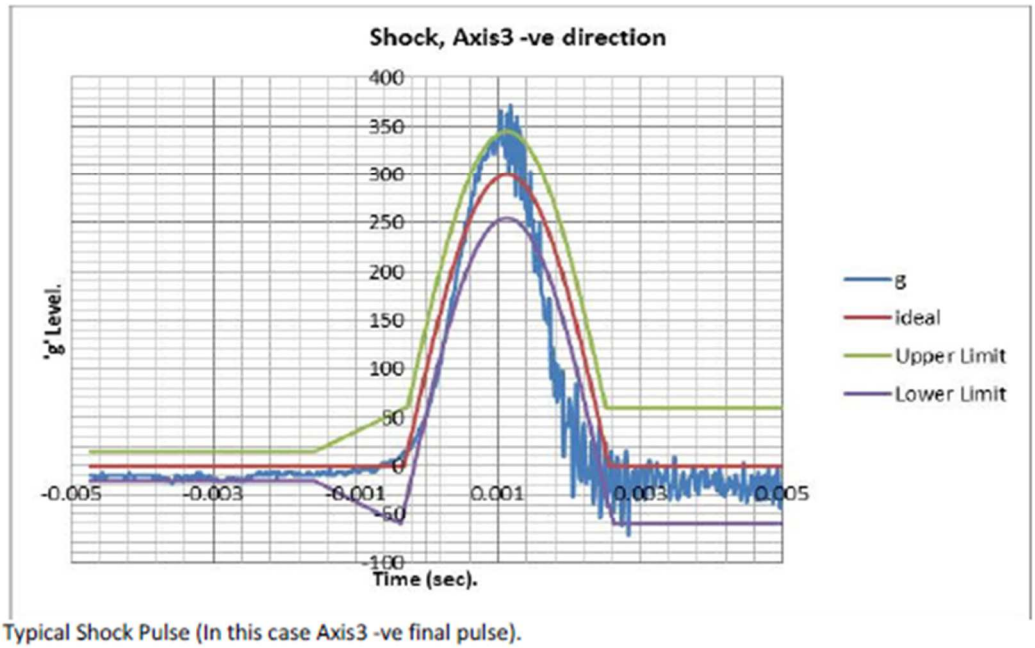
No visible damage or deterioration, no discontinuities detected of >1 µsec.

Test Results (continued).

Shock, Half Sine, All samples.



Typical Shock Pulse (In this case Axis1 +ve initial pulse).



Typical Shock Pulse (In this case Axis3 -ve final pulse).

Test Results (continued).
Shock, Half Sine, All samples.

No discontinuities detected of >1 µsec during the application of all 18 Shock impacts, no visible damage or deterioration, no loosening of parts.

Conclusion

Of the Series 79 samples tested, all successfully passed the requirements of QTP-406 in terms of Vibration and Shock.

18. Shell-to-shell Conductivity

18.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Mated connectors shall be tested in accordance with test procedure EIA-364-83.

18.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

18.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Power supply	GC1	60782	Toellner / TOE8872	07/16
Voltmeter	NV01	MY42002275	Agilent / 34420A	04/16

18.4. Requirement – Requisiti

When tested probes shall not puncture or otherwise damage the connector finisch and the maximum measured potential drop across assemblies shall be 2.5 mV for plugs with spring fingers.

18.5. Date and place of test – Data e luogo della prova

29/03/16– Glenair Italia TestLab – Electrical Test Room

18.6. Environmental conditions – Condizioni ambientali

Temperature: 22,2 °C
Humidity: 39,9 %

18.7. Result – Risultati

Shell-to-shell conductivity	
Sample	**Measure (mV)**
SN007 mated with SN008	0,843
SN009 mated with SN010	0,422
SN011 mated with SN012	1,48

18.8. Comments / remarks – Commenti / osservazioni

The samples are in compliance with the specification.

19. Humidity

19.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Wired, mated connectors shall be tested in accordance with tets procedure EIA-364-31.

- Test method IV.
- The mated connectors shall be mounted in a horizontal position.
- Step 7a shall be performed during the last 5 cycles
- Three hours minimum after the star of step 7a during the final cycle and while the connectors are still subjected to high humidity, insulation resistance and dielectric withstanding voltage shall be measured when the chamber temperature reaches 20°C ± 5°C and condensation is observed on the connector.
- For qualification testing, insulation resistance readings shall be made on a minimum of 50 percent of the circuits. Outer circuits shall be measured to the connector shell.

19.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

19.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Megaohmmetro	R7	1004308	Sefelec M1501M	10/16

Dieletric breakdown tester	UH28CS/2	20230109100182	Etl-Prueftechnik/ UH28CS	03/16
Climatic chamber	DY250C	TT0506	ACS / DY250C	06/16

19.4. Requirement – Requisiti

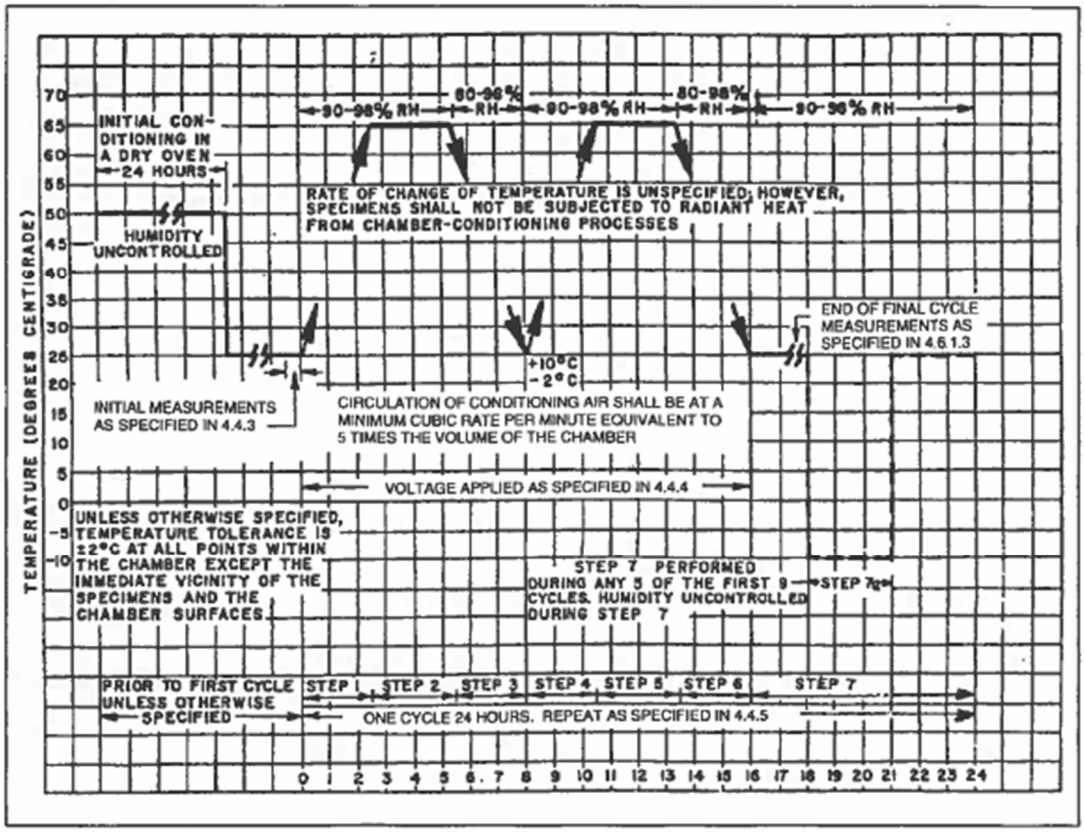
When tested, wired, mated connectors shall show no deterioration which will adversely affect performance of the connector. During the final cycle, insulation resistance shall be 100 MΩ or greater.

19.5. Date and place of test – Data e luogo della prova

From 01/04/16 to 11/04/16 Glenair Italy test laboratory – Environmental Test Room

19.6. Environmental conditions – Condizioni ambientali

Cycle:



19.7. Result – Risultati

SN007 mated with SN008			
PIN	**IR before humidity**	**IR after humidity**	**D.W.V.**
1	330 GΩ	4,86 GΩ	V=750 V OK I=0,1 mA
2	172,8 GΩ	5,84 GΩ	V=750 V OK I=0,1 mA
3	331 GΩΩ	1,929 GΩ	V=750 V OK I=0,1 mA
4	212 GΩ	7,23 GΩ	V=750 V OK I=0,1 mA
5	302 GΩ	278 MΩ	V=750 V OK I=0,1 mA
6	264 GΩ	5,69 GΩ	V=750 V OK I=0,1 mA
7	154,5 GΩ	5,48 GΩ	V=750 V OK I=0,1 mA
8	241 GΩ	4,57 GΩ	V=750 V OK I=0,1 mA
9	221 GΩ	6,58 GΩ	V=750 V OK I=0,1 mA
10	284 GΩ	5,97 GΩ	V=750 V OK I=0,1 mA
11	339 GΩ	5,44 GΩ	V=750 V OK I=0,1 mA
12	319 GΩ	5,24 GΩ	V=750 V OK I=0,1 mA
13	228 GΩ	201 MΩ	V=750 V OK I=0,1 mA
14	222 GΩ	769 MΩ	V=750 V OK I=0,1 mA
15	166,8 GΩ	3,31 GΩ	V=750 V OK I=0,1 mA
16	189, 9 GΩ	1,661 GΩ	V=750 V OK I=0,1 mA
17	290 GΩ	6,65 GΩ	V=750 V OK I=0,1 mA
18	235 GΩ	2,25 GΩ	V=750 V OK I=0,1 mA
19	171,8 GΩ	1,86 GΩ	V=750 V OK I=0,1 mA
20	286 GΩ	4,36 GΩ	V=750 V OK I=0,1 mA
21	280 GΩ	292 MΩ	V=750 V OK I=0,1 mA
22	341 GΩ	2,74 GΩ	V=750 V OK I=0,1 mA
23	228 GΩ	4,43 GΩ	V=750 V OK I=0,1 mA
24	222 GΩ	6,82 GΩ	V=750 V OK I=0,1 mA
25	195, 2 GΩ	4,91 GΩ	V=750 V OK I=0,1 mA
26	287 GΩ	2,58 GΩ	V=750 V OK I=0,1 mA
27	200 GΩ	6,28 GΩ	V=750 V OK I=0,1 mA
28	338 GΩ	5,26 GΩ	V=750 V OK I=0,1 mA
29	316 GΩ	4,61 GΩ	V=750 V OK I=0,1 mA
30	258 GΩ	358 MΩ	V=750 V OK I=0,1 mA
31	267 GΩ	7,24 GΩ	V=750 V OK I=0,1 mA
32	172 GΩ	9,83 GΩ	V=750 V OK I=0,1 mA
33	240 GΩ	1,937 GΩ	V=750 V OK I=0,1 mA

SN009 mated with SN010			
PIN	**IR before humidity**	**IR after humidity**	**D.W.V.**

1	60,5 GΩ	0,485 GΩ	V= 1800 OK, I=0,15 mA
2	57 GΩ	2,28 GΩ	V= 1800 OK, I=0,15 mA
3	58,6 GΩ	1,363 GΩ	V= 1800 OK, I=0,15 mA
4	75,1 GΩ	0 613 GΩ	V= 1800 OK, I=0,15 mA
5	46,5 GΩ	5,28 GΩ	V= 1800 OK, I=0,15 mA

SN011 mated with SN012			
PIN	**IR before humidity**	**IR after humidity**	**D.W.V.**
A1	91 GΩ	5,67 GΩ	V= 1800 OK, I=0,15 mA
A2	67,7 GΩ	23,1 GΩ	V= 1800 OK, I=0,15 mA
1	207 GΩ	34,3 GΩ	V=750 V OK I=0,1 mA
2	148,4 GΩ	12,65 GΩ	V=750 V OK I=0,1 mA
3	170,2 GΩ	27,7 GΩ	V=750 V OK I=0,1 mA
4	208 GΩ	62,4 GΩ	V=750 V OK I=0,1 mA
5	208 GΩ	10,38 GΩ	V=750 V OK I=0,1 mA
6	195,4 G	29,5 GΩ	V=750 V OK I=0,1 mA
7	220 GΩ	68,7 GΩ	V=750 V OK I=0,1 mA
8	223 GΩ	14,25 GΩ	V=750 V OK I=0,1 mA
9	237 GΩ	61,1 GΩ	V=750 V OK I=0,1 mA

19.8. Result – Risultati

Samples SN007, SN008, SN009, SN010, SN011, SN012 are in compliance with the specification.

20. Post Test Examination

20.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The tested connectors and contacts shall be examined to determine the effects of previous testing. Any evidence of cracking, loosening of parts, carbon tracking, excess wear, or missing parts shall be recorded.

20.2. Items tested – Campioni sottoposti a prova

SN007, SN008, SN009, SN010, SN011, SN012

20.3. **Relevant equipment** – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
--	--	--	--	--

20.4. **Requirement** – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

20.5. **Date and place of test** – Data e luogo della prova

12/04/16– Glenair Italia TestLab – Environmental Test Room

20.6. **Environmental conditions** – Condizioni ambientali

Temperature: 27,4 °C
Humidity: 31,6 %

20.7. **Result** – Risultati

Sample	Result
SN007	OK
SN008	OK
SN009	OK
SN010	OK
SN011	OK
SN012	OK

20.8. Comments / remarks – commenti / osservazioni

Samples SN007, SN008, SN009, SN010, SN011 and SN012 are in compliance with the specification.

GROUP 3

21. Visual and Mechanical Examination

21.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The connectors shall be visually and mechanically examined to ensure conformance with the specification and the applicable military standards.

21.2. Items tested – Campioni sottoposti a prova

SN015, SN016, SN017, SN018, SN019, SN020, SN021, SN022, SN023, SN024, SN025, SN026, SN027, SN028, SN029, SN030, SN031, SN032, SN033, SN034, SN035, SN036

21.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
--	--	--	--	--

21.4. Requirement – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

21.5. Date and place of test – Data e luogo della prova

11/09/15– Glenair Italia TestLab – Environmental Test Room

21.6. Environmental conditions – Condizioni ambientali

Temperature: 28,0 °C
Humidity: 33,8 %

21.7. Result – Risultati

Sample	Result
SN015	OK, no defects detected
SN016	OK, no defects detected
SN017	OK, no defects detected
SN018	OK, no defects detected
SN019	OK, no defects detected
SN020	OK, no defects detected
SN021	OK, no defects detected
SN022	OK, no defects detected
SN023	OK, no defects detected
SN024	OK, no defects detected
SN025	OK, no defects detected
SN026	OK, no defects detected
SN027	OK, no defects detected
SN028	OK, no defects detected
SN029	OK, no defects detected
SN030	OK, no defects detected
SN031	OK, no defects detected
SN032	OK, no defects detected
SN033	OK, no defects detected
SN034	OK, no defects detected
SN035	OK, no defects detected
SN036	OK, no defects detected

21.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

22. Water Immersion

22.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Tested in accordance with MIL-STD-810F method 512.4.
Mated connectors shall be submerged in water at 1 meter (0.1 bar) for 1 hour.

22.2. Items tested – Campioni sottoposti a prova

SN015, SN016

22.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Megaohmmetro	R7	1004308	Sefelec M1501M	10/16
Manometer	BAR1	931829	Esi-Tec / GS4200-USB	05/16

22.4. Requirement – Requisiti

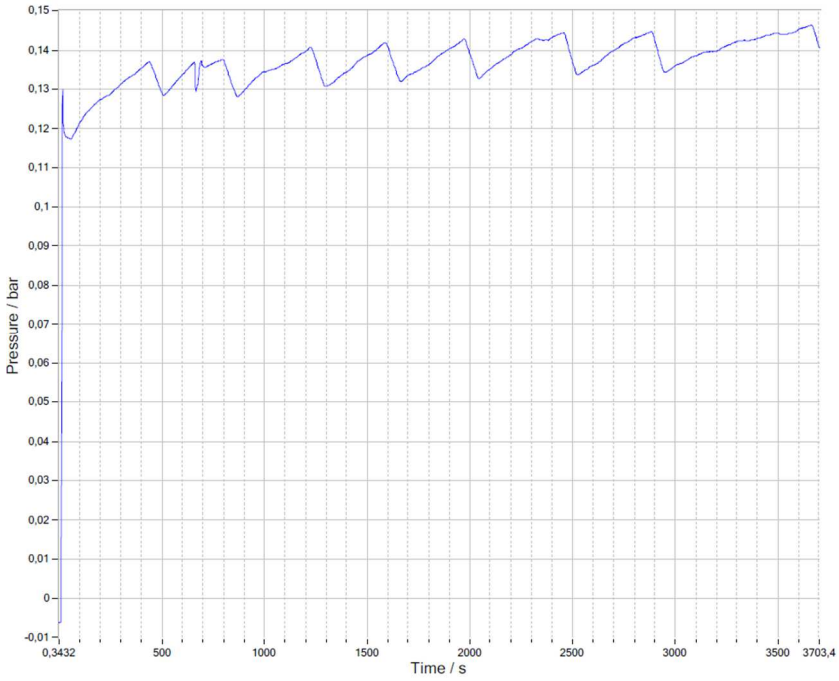
There shall be no evidence of water penetration into mated connectors when subjected to MIL-STD-810F method 512.4.

22.5. Date and place of test – Data e luogo della prova

14/09/15– Glenair Italia TestLab – Environmental Test Room

22.6. Environmental conditions – Condizioni ambientali

Pressure graph:



22.7. Result – Risultati

SN015 mated with SN16		
PIN	**IR before water immersion**	**IR after water immersion**
1	0,321 TΩ	0,345 TΩ
2	0,451 TΩ	0,726 TΩ
3	0,345 TΩ	0,391 TΩ
4	0,317 TΩ	0,347 TΩ
5	0,449 TΩ	0,609 TΩ

There is no water inside the connector.

22.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

23. Mating and Un-mating Force

23.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Mated connectors shall meet the requirements of table.

Axial Force (LSB)	
MAX. Mating Force	**MIN. Unmating Force**
(6LBS for Ground Spring) + (Number of 23 Gauge Contacts x 0.50 LBS) + (Number of 16 Gauge Contacts x 1.88 LBS) + (Number of 12 Gauge Contacts x 1.88 LBS) = Total Mating Force	(3LBS for Ground Spring) + (Number of 23 Gauge Contacts x 0.047 LBS) + (Number of 16 Gauge Contacts x 0.125 LBS) + (Number of 12 Gauge Contacts x 0.125 LBS) = Total Unmating Force

The rate of mating and unmating shall be 1 to 10 cycles per minute

23.2. Items tested – Campioni sottoposti a prova

SN015, SN016

23.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Dynamometer	DIN6	T06372	Chatillon DFEMETEK 200	10/16

23.4. Requirement – Requisiti

The force for mating and unmating of counterpart connectors shall be tested in accordance with test procedure EIA-363-13. The connectors used in this test shall have the complement of contacts.

23.5. Date and place of test – Data e luogo della prova

13/10/15– Glenair Italia TestLab – Environmental Test Room

23.6. Environmental conditions – Condizioni ambientali

Temperature: 25,0 °C
Humidity: 32,4 %

23.7. Result – Risultati

Sample	Mating (N)		Un-mating (N)	
	Requirement	Measure	Requirement	Measure
SN015 mated with SN016	37.8	14	23.8	10

23.8. Comments / remarks – commenti / osservazioni

Samples pass the test.

24. Fluid Immersion and dielectric withstanding voltage

24.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Connector samples shall be tested in accordance with test procedure EIA-364-10 (one sample per fluid).
Following the fluid immersion cycles, the dielectric withstanding voltage at sea level shall be tested within 3 hours.

Test condition	Fluid	Preconditioning		Test cycles					Number of cycles	Samples
				Immersion		Drainage time	Oven cure, mated			
		Time (minutes)	Temp (°C)	Time (minutes)	Temp ± 3 °C	Free air (hours)	Time (minutes)	Temp ± 3 °C		
A	Hydraulic fluid, per MIL-PRF-5606 or MIL-PRF-87257 or MIL-PRF-83282	--	--	5	85	1	6	100	7	SN017 SN018
B	Turbine fluid, grade IP-8, per MIL-DTL-83133 (NATO Type 34)	--	--	5	25	1	6	55	7	SN019 SN020
C	Lubricating oil, per MIL-PRF-7808	--	--	5	120	1	6	125	7	SN021 SN022
D	Lubricating oil, per MIL-PRF-23699	--	--	5	120	1	6	125	7	SN023 SN024

E	Defrosting fluid, per SAE AMS 1424	--	--	5	65	1	6	100	7	SN025 SN026
F	Cleaning compound, diluted for cleaning, per MIL-PRF-87937	--	--	5	65	1	6	100	7	SN027 SN028
G	Gasoline, per ASTM-D-4814	--	--	5	25	24	--	--	5	SN029 SN030
H	Gasohol, per A-A-52530	--	--	5	25	24	--	-	5	SN031 SN032
I	One part isopropyl alcohol, per TT-I-735, grade A or B; and 3 parts mineral spirits, per MIL-PRF-680, type I, by volume	--	--	5	25	24	--	--	5	SN033 SN034
K	Coolant, dielectric fluid, hydrolytically stable per MIL-PRF-87252	30	175	1 ± 0,1	15°C < temperature < 30°C 20% < humidity < 80%	1	--	--	1	SN035 SN036

24.2. Items tested – Campioni sottoposti a prova

SN017, SN018, SN019, SN020, SN021, SN022, SN023, SN024, SN025, SN026, SN027, SN028, SN029, SN030, SN031, SN032, SN033, SN034, SN035, SN036

24.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Oven	FO16	32111	Fratelli Galli / G-2100	07/16
Oven	FO19	32562	Fratelli Galli / G-210F100P	07/16
Thermometer	TC-08-02	AO012/310	Pico Technology / TC08	05/16

Thermocouple	TC01-2	--	RS762-1124 / T thermocouple	06/16
Thermocouple	TC115	--	RS762-1124 / T thermocouple	05/16

24.4. **Requirement** – Requisiti

When tested, connectors shall meet the requirements for dielectric withstanding voltage.

24.5. **Date and place of test** – Data e luogo della prova

From 24/09/15 to 26/11/15 – Glenair Italia TestLab – Environmental Test Room

24.6. **Environmental conditions** – Condizioni ambientali

Condition during dielectric withstanding voltage test:

02/10/15
Temperature: 24,5 °C
Humidity: 33,8 %

14/10/15
Temperature: 27,4 °C
Humidity: 38,1 %

24/10/15
Temperature: 26,5 °C
Humidity: 39,2 %

26/10/15
Temperature: 27,0 °C
Humidity: 35,9 %

11/11/15
Temperature: 24,8 °C
Humidity: 28,7 %

26/11/15
Temperature: 28,3 °C
Humidity: 25,0 %

24.7. Result – Risultati

PIN	D.W.V				
	SN017 + SN018	SN019 + SN020	SN021 + SN022	SN023 + SN024	SN025 + SN026
1	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
2	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
3	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
4	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
5	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
6	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
7	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
8	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
9	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
10	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
11	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
12	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
13	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
14	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
15	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
16	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
17	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
18	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
19	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
20	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
21	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
22	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
23	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
24	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
25	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
26	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
27	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
28	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
29	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
30	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
31	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
32	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
33	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
34	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
35	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
36	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
37	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
38	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA

PIN	D.W.V				
	SN017 + SN018	SN019 + SN020	SN021 + SN022	SN023 + SN024	SN025 + SN026
39	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
40	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
41	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
42	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
43	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
44	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
45	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
46	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
47	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
48	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
49	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
50	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
51	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
52	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
53	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
54	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
55	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
56	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
57	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
58	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
59	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
60	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
61	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
62	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
63	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
64	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
65	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
66	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA

PIN	D.W.V				
	SN027 + SN028	SN029 + SN030	SN031 + SN032	SN033 + SN034	SN035 + SN036
1	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
2	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
3	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
4	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
5	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
6	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
7	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
8	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
9	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA

PIN	D.W.V				
	SN027 + SN028	SN029 + SN030	SN031 + SN032	SN033 + SN034	SN035 + SN036
10	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
11	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
12	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
13	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
14	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
15	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
16	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
17	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
18	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
19	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
20	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
21	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
22	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
23	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
24	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
25	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
26	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
27	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
28	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
29	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
30	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
31	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
32	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
33	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
34	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
35	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
36	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
37	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
38	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
39	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
40	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
41	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
42	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
43	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
44	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
45	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
46	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
47	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
48	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
49	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA

PIN	D.W.V				
	SN027 + SN028	SN029 + SN030	SN031 + SN032	SN033 + SN034	SN035 + SN036
50	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
51	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
52	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
53	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
54	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
55	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
56	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
57	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
58	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
59	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
60	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
61	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
62	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
63	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
64	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
65	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA
66	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA	OK, I < 0.1mA

24.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

25. Post Test Examination

25.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The tested connectors and contacts shall be examined to determine the effects of previous testing. Any evidence of cracking, loosening of parts, carbon tracking, excess wear, or missing parts shall be recorded.

25.2. Items tested – Campioni sottoposti a prova

SN015, SN016, SN017, SN018, SN019, SN020, SN021, SN022, SN023, SN024, SN025, SN026, SN027, SN028, SN029, SN030, SN031, SN032, SN033, SN034, SN035, SN036

25.3. **Relevant equipment** – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
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25.4. **Requirement** – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

25.5. **Date and place of test** – Data e luogo della prova

13/10/15– Glenair Italia TestLab – Environmental Test Room

25.6. **Environmental conditions** – Condizioni ambientali

Temperature: 25,4 °C
Humidity: 32,4 %

25.7. **Result** – Risultati

Sample	Result
SN015	OK, no defects detected
SN016	OK, no defects detected
SN017	OK, no defects detected
SN018	OK, no defects detected
SN019	OK, no defects detected
SN020	OK, no defects detected
SN021	OK, no defects detected
SN022	OK, no defects detected
SN023	OK, no defects detected
SN024	OK, no defects detected

SN025	OK, no defects detected
SN026	OK, no defects detected
SN027	OK, no defects detected
SN028	OK, no defects detected
SN029	OK, no defects detected
SN030	OK, no defects detected
SN031	OK, no defects detected
SN032	OK, no defects detected
SN033	OK, no defects detected
SN034	OK, no defects detected
SN035	OK, no defects detected
SN036	OK, no defects detected

25.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

GROUP 4

26. Visual and Mechanical Examination

26.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The connectors shall be visually and mechanically examined to ensure conformance with the specification and the applicable military standards.

26.2. Items tested – Campioni sottoposti a prova

SN037, SN038, SN039, SN040

26.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
--	--	--	--	--

26.4. Requirement – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

26.5. Date and place of test – Data e luogo della prova

03/02/16– Glenair Italia TestLab – Environmental Test Room

26.6. Environmental conditions – Condizioni ambientali

Temperature: 25,6 °C
Humidity: 27,7 %

26.7. Result – Risultati

Sample	Result
SN037	OK, no defects detected
SN038	OK, no defects detected
SN039	OK, no defects detected
SN040	OK, no defects detected

26.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

27. Contact Resistance

27.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Contacts of mated connectors shall be tested in accordance with test procedure EIA-364-06.

27.2. Items tested – Campioni sottoposti a prova

SN037 mated with SN039
SN038 mated with SN040

27.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Power supply	GC1	60782	Toellner / TOE8872	07/16
Voltmeter	NV01	MY42002275	Agilent / 34420A	04/16

27.4. Requirement – Requisiti

When tested, contacts in the mated condition shall meet the contact resistance requirements in table.

Max Wire Size	Test Current (A)	Voltage Drop (mV)
12	23	42
14	17	40
16	13	49
20	7,5	55
22	5	73
24	3	45
26	2	52
28	1,5	54

27.5. Date and place of test – Data e luogo della prova

05/02/16– Glenair Italia TestLab – Electrical Test Room

27.6. Environmental conditions – Condizioni ambientali

Temperature: 23,7 °C
Humidity: 25,1 %

27.7. **Result** – Risultati

Voltage Drop cable size 16 = 270 mV
Voltage Drop cable size 23 = 590 mV

SN037 – SN039		
PIN	**Voltage Drop (mV)**	**Voltage Drop – Cable (mV)**
A1	300	30
A2	300	30
A3	300	30
A4	300	30
A5	300	30
A6	300	30
A7	300	30
A8	300	30
A9	300	30

SN038 – SN040		
PIN	**Voltage Drop (mV)**	**Voltage Drop – Cable (mV)**
A1	310	40
A2	310	40
1	620	30
2	600	10
3	610	20
4	620	30
5	620	30
6	600	10
7	630	40
8	620	30
9	620	30
10	610	20
11	600	10
12	600	10
13	600	10
14	620	30
15	620	30
16	610	20
17	610	20
18	600	10
19	630	40
20	620	30
21	620	30
22	640	50
23	630	40

27.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

28. Low Level Contact Resistance

28.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Test in accordance with EIA-364-23.
100 mA maximum and 20 mV maximum open circuit voltage.

28.2. Items tested – Campioni sottoposti a prova

SN037 mated with SN039
SN038 mated with SN040

28.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Milliohmmetro	R1	149724	Burster mod. 2318	07/16

28.4. Requirement – Requisiti

The low signal contact resistance of each mated contact pair shall not exceed the applicable values in table.

Wire Size	Max mΩ
16	5
20	9
22	15
24	20
26	31
28	50

28.5. Date and place of test – Data e luogo della prova

04/04/16– Glenair Italia TestLab – Electrical Test Room

28.6. Environmental conditions – Condizioni ambientali

Temperature: 24,7 °C
Humidity: 44,0 %

28.7. Result – Risultati

Measure of cable size 16 = 20,54 mΩ
Measure of cable size 23 = 110,18 mΩ

SN037 – SN039		
PIN	**Measure (mΩ)**	**Measure – Cable (mΩ)**
A1	22,98	2,44
A2	22,94	2,40
A3	22,96	2,42
A4	23,00	2,46
A5	22,92	2,38
A6	22,89	2,35
A7	22,89	2,35
A8	22,93	2,39
A9	22,85	2,31

SN038 – SN040		
PIN	**Voltage Drop (mV)**	**Voltage Drop – Cable (mV)**
A1	23,97	3,43
A2	23,96	3,43
1	126,18	16,00
2	124,91	14,73
3	125,01	14,83
4	124,81	14,63
5	125,06	14,88
6	125,05	14,87
7	125,72	15,54
8	126,61	16,43
9	125,16	14,98
10	125,06	14,88

SN038 – SN040		
PIN	**Voltage Drop (mV)**	**Voltage Drop – Cable (mV)**
11	125,02	14,84
12	125,09	14,91
13	125,15	14,97
14	125,71	15,53
15	125,68	15,50
16	125,79	15,61
17	125,21	15,03
18	125,66	15,48
19	126,40	16,22
20	125,42	15,24
21	125,38	15,20
22	125,82	15,64
23	125,53	15,35

28.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

29. Current Rating

29.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Tested in accordance with EIA-364-70 method 1.

29.2. Items tested – Campioni sottoposti a prova

SN037 mated with SN039
SN038 mated with SN040

29.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Power supply	GC1	60782	Toellner / DET5X1000	07/16

Current Clamp Meter	PA6	15040058	ISO-TECH / ICM2000	05/16
Thermometer	TR03	14036424	Delta Ohm / HD2178.2	05/16
Thermocouple	TC110	---	Tersid / T Thermocouple	05/16
Thermometer	TC-08-4	AO016/017	Pico Technology / TC08	05/16
Thermocouple	TC124	---	RS762-1124 / T thermocouple	05/16
Thermocouple	TC125	---	RS762-1124 / T thermocouple	05/16
Thermocouple	TC127	---	RS762-1124 / T thermocouple	05/16
Thermocouple	TC67	---	RS762-1124 / T thermocouple	05/16

29.4. **Requirement** – Requisiti

The current rating of the size 23 and size 16 contacts shall be 5 A and 13 A respectively.

29.5. **Date and place of test** – Data e luogo della prova

06/04/16– Glenair Italia TestLab – Enviromental Test Room

29.6. **Environmental conditions** – Condizioni ambientali

Temperature: 26,7 °C
Humidity: 31,2 %

29.7. **Result** – Risultati

Sample	Size	Test current applied (A)	ΔT Contact (°C)	ΔT Ext. sheet of the cable 1 (°C)	ΔT Ext. sheet of the cable 2 (°C)	ΔT Junction (°C)
SN037 SN039	16	13	7,76	10,44	8,74	2,81
SN038 SN040	16	13	6,93	9,41	8,95	3,05

Sample	Size	Test current applied (A)	ΔT Contact (°C)	ΔT Ext. sheet of the cable 1 (°C)	ΔT Ext. sheet of the cable 2 (°C)	ΔT Junction (°C)
SN038 SN040	23	5	10,01	11,61	11,34	2,85

29.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

30. Solderability

30.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Printed circuit tail terminations shall be tested in accordance with method EIA-364-52, category 3, IEC-60512-12-1 and IEC-68-2-20 test Ta, method 1. Connectors will undergo 8 hours of steam aging prior to test at 245 °C with a 4 to 5 second dwell and 10 x magnification.

30.2. Items tested – Campioni sottoposti a prova

SN038 mated with SN040

30.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Soldering pot bath	PS01	05301214000172	Hakko / FX-301B	11/16
Megaohmmetro	R7	1004308	Sefelec M1501M	10/16

30.4. Requirement – Requisiti

Solder able, non-removable contact terminations shall withstand the test. Printed circuit tails shall meet the solder ability requirements of MIL-STD, method 208.

30.5. Date and place of test – Data e luogo della prova

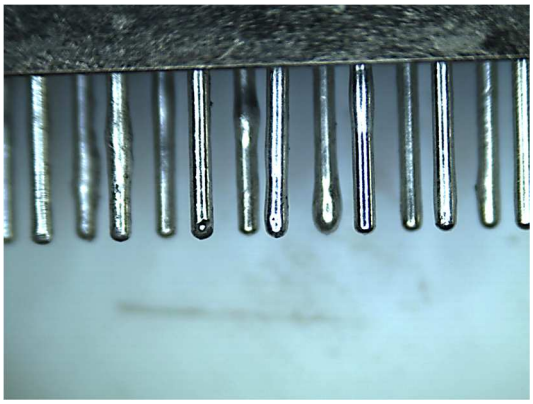
14/04/16– Glenair Italia TestLab – Enviromental Test Room

30.6. Environmental conditions – Condizioni ambientali

Temperature: 25,3 °C
Humidity: 34,7 %

30.7. Result – Risultati

SN038



The contacts are completely covered by the solder and don't show defects.

30.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

31. Resistance to Solder Heat

31.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

Unmated connectors with printed circuit tails shall be tested in accordance with EIA-364-56 and IEC-60512-12-5 test 12e. Connectors shall be tested as follows:

- The test specimens shall be fluxed accordingly with flux liquid or other techniques

- The solder iron shall be heated to a temperature of 260°C and shall be applied to the termination for a period necessary to hold the solder in a liquid state for a time duration of 10 seconds. Solder type to be used is Sn-63 in accordance with J-STD-006.
- After application, the soldering iron shall be removed and a visual (10 x magnification) and mechanical inspection performed.

31.2. Items tested – Campioni sottoposti a prova

SN037 mated with SN039

31.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
Soldering station	SA02	53262698	Weller / WSD81	04/17
Megaohmmeter	R7	1004308	Sefelec M1501M	10/16

31.4. Requirement – Requisiti

Fixed, non-removable contact connectors shall withstand the tests. The connector shall show no evidence of distortion or damage to any area of the connector housing. Connector shall meet insulation resistance requirement.

31.5. Date and place of test – Data e luogo della prova

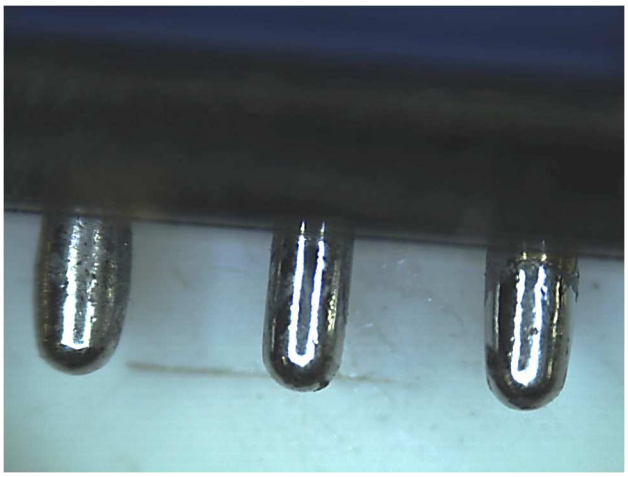
14/04/16– Glenair Italia TestLab – Enviromental Test Room

31.6. Environmental conditions – Condizioni ambientali

Temperature: 25,3 °C
Humidity: 34,7 %

31.7. Result – Risultati

SN037



The contacts soldered are completly covered by solder and don't show defects.

SN037 mated with SN039		
PIN	**IR before Resistance to solder heat (GΩ)**	**IR after resistance to solder heat (GΩ)**
A1	235	202
A2	198,7	43,2
A3	123,5	5,89
A4	68,9	5,3
A5	210	50
A6	167,7	133,6
A7	76,6	12,31
A8	89,9	5,54
A9	104,5	8,87

31.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

32. Post Test Examination

32.1. Description of Test method procedure – Descrizione della procedura del metodo di prova

The tested connectors and contacts shall be examined to determine the effects of previous testing. Any evidence of cracking, loosening of parts, carbon tracking, excess wear, or missing parts shall be recorded.

32.2. Items tested – Campioni sottoposti a prova

SN037, SN038, SN039, SN040

32.3. Relevant equipment – Strumenti utilizzati

Equipment Strumento	**Internal code** Codice interno	**Serial Number** Numero di matricola	**Manufacturer / model** – marca / modello	**Calibration expiration date** – scadenza taratura
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32.4. Requirement – Requisiti

Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance.

32.5. Date and place of test – Data e luogo della prova

14/04/16– Glenair Italia TestLab – Environmental Test Room

32.6. Environmental conditions – Condizioni ambientali

Temperature: 27,4 °C
Humidity: 31,6 %

32.7. Result – Risultati

Sample	Result
SN037	OK, no defects detected
SN038	OK, no defects detected
SN039	OK, no defects detected
SN040	OK, no defects detected

32.8. Comments / remarks – commenti / osservazioni

The samples are in compliance with the specification.

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QUALIFICATION TEST PLAN (QTP-406)

Cage Code: 06324	Document Description Qualification Test Plan QTP-406 **SERIES 79 MICRO-CRIMP CONNECTORS**	Document #: QTP-406 Revision: Preliminary 5 Page 1 of 22

QTP-406

QUALIFICATION TEST PLAN FOR
SERIES 79 MICRO-CRIMP CONNECTORS

***Signatures on file**

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QUALIFICATION TEST PLAN (QTP-406)

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QUALIFICATION TEST PLAN (QTP-406)

REVISION HISTORY

REVISION	DATE	REVISED SECTION	REVISIONS
1	2/16/2015	N/A	Preliminary Release
2	3/02/2015	Para 4.3.1 Test Connectors	Group 3. Added SN: 027- 036
3	9/10/2015	Para 3.6.1 Wire Sealing Para 4.3.1 Test Connectors	Corrected Wire Sizes and Diameters Group 4. Added SN: 039- 040
4	11/05/2015	Para 4.4.16 Altitude-Low Temperature	Pressure and Voltage values
5	01/27/2016	Para 4.3.1 Test Connectors	Group 2. Backshell Replacements

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QUALIFICATION TEST PLAN (QTP-406)

1.0 SCOPE

1.1 Scope. This document covers different classes of series 79 micro-crimp intermateable, straight or right angle these connectors use removable crimp contacts or fixed printed circuit tails.

1.2 Description. All classes are designed to assure proper orientation of the mating halves prior to electrical circuit closure. All classes include EMI shielding capability. Classes I and II include rear release, removable pin and socket contacts with crimp termination. Classes III and IV include fixed printed circuit pin and socket contacts.

1.3 Classification.

1.3.1 Connectors. Connectors fabricated to this specification are classified as follows:

a. Classes:

I – Cable Connectors
II – Straight Printed Circuit Board Tailed Connectors

b. Types:

(1) Plugs:

- Standard connector, with spring fingers that make contact to receptacle shell prior to contact engagement
- Scoop proof, with spring fingers that make contact to receptacle shell prior to contact engagement

(2) Receptacles:
- Standard connectors
- Scoop proof

c. Temperature ranges: The upper temperature is the maximum internal hotspot temperature resulting from any combination of electrical load and ambient conditions.

M– Electroless nickel coating (conductive) -65° to +150°C

d. Contact styles:

M39029 Type Socket
M39029 Type Pin

e. Hardware options:

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N – Thru-hole, no hardware
P – Female jackpost
L – Low-profile captivated jackscrew, hex head
K – Slot-headed extended jackscrew
S – Low-profile captivated jackpost, hex head
T – Slot-head extended captivated jackpost

2.0 APPLICABLE DOCUMENTS

2.1 Non-Government Documents

EIA-357	EIA Statistical Process Control Systems
EIA-359	EIA Standard Colors for Color Identification and Coding
EIA-364	Electrical Connector/Socket Test Procedures Including Environmental Classifications
EIA-364-03	Altitude Immersion Test Procedure for Electrical Connectors
IEA-364-06	Contact Resistance Test Procedure for Electrical Connectors
IEA-364-09	Mechanical Durability Test Procedure for Electrical Connectors
EIA-364-10	Fluid Immersion Test Procedure for Electrical Connectors
EIA-364-20	Dielectric 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
EIA-364-26	Salt Spray Test Procedure for Electrical Connectors, Contacts and Sockets
EIA-364-27	Mechanical Shock (Specified Pulse) Test Procedure for Electrical Connectors
EIA-364-28	Vibration Test Procedure for Electrical Connectors and Sockets
EIA-364-29	Contacts Retention Test Procedure for Electrical Connectors
EIA-364-31	Humidity Test Procedure for Electrical Connectors and Sockets
EIA-364-32	Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors and Sockets
EIA-364-35	Insert Retention Test Procedure for Electrical Connectors

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EIA-364-42	Impact Test Procedure for Electrical Connectors
EIA-364-54	Magnetic Permeability Test Procedure for Electrical Connectors, Contacts, and Sockets
EIA-364-56	Resistance to Soldering
EIA-364-66	EMI Shielding Effectiveness Test Procedure for Electrical Connectors
EIA-364-83	Shell-to-Shell Resistance Test Procedure for Electrical Connectors
EIA-364-105	Altitude-Low Temperature Test Procedure for Electrical Connectors

3.0 REQUIREMENTS

3.1 Specification Sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. Connectors and accessories furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award.

3.3 Components. Materials for specific components of the connector shall be as follows:

3.3.1 Connector Construction.
a. Shell - Impact extruded or machined aluminum alloy.
b. Shell finish - M: electrically conductive electroless nickel plating in accordance with ASTM B733
c. Insert - Reinforced epoxy resin or other suitable rigid dielectric material.
d. Spring fingers - Heat-treated beryllium copper or corrosion-resistant steel.
e. Filler compound - RTV silicone in accordance with MIL-A-46146, or equivalent.
f. Grommet and interfacial seals - Silicone or fluorosilicone elastomer.
g. Contacts – Gold plate per ASTM-B-488, Type II, Code C (.000050-.000100” thick per side) over Beryllium Copper 17200 or 17300 IAW ASTM B196
h. Potting materials – Hysol EE4215 or equivalent

3.4 Fungus Resistance. Materials used in the construction of these connectors shall be fungus inert (see 4.2.1).

3.5 Contacts. Contacts shall be fixed or crimp removable, as specified.

3.5.1 Printed Wired Contacts. Printed wired contacts are to be permanently potted in place.

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3.5.2 Contact Arrangement. Contact arrangement shall be in accordance with Drawing 799-009. Test voltages shall be as specified in table I.

TABLE I. Test voltages, AC RMS, 60 Hz.

Contact Size	Test Voltage
#23 Gauge	750
#16 Gauge	1800
#12 Gauge	1800

3.5.3 Installing and Removal Tool. Both MIL-I-81969/14 and MIL-I-81969/14-03 shall be utilized to properly assemble and disassemble the pin and socket contacts into their connector inserts.

3.6 Sealing.

3.6.1 Wire Sealing. Connectors shall be designed to meet the environmental requirements of this specification using wire of outer diameter within the applicable range as shown in table II.

TABLE II. Wire Sizes and Diameters

Contact Size	Wire Size (AWG)	Finished wire outside dimensions			
		Minimum		Maximum	
		Inches	mm	Inches	mm
23	28, 26, 24, 22	.030	.76	.050	1.27
16	20, 18, 16	.065	1.65	.109	2.77
12	14, 12	.097	2.46	.142	3.61

NOTE: Connectors shall meet the requirements specified when:

a. A full complement of wire of the applicable minimum or maximum insulation diameter is installed.
b. Any combination of wire diameters within the extremes of (a), above are used.

3.7 Magnetic Permeability. The relative permeability of the wired, assembled, and fully mated connector assembly shall be less than 2.0μ when measured in accordance with 4.4.2.

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TABLE III. Installing and Removal Forces

Contact size	Installing and removal forces (maximum)	
	Pounds	Newtons
23	.50	2.22
16	1.88	8.34
12	1.88	8.34

3.8 Mating and Unmating Forces. The force for mating and unmating of counterpart connectors shall be tested in accordance with test procedure EIA-363-13. The connectors used in this test shall have the complement of the contacts.Testing shall be as specified in 4.4.4.

TABLE IV. Mating and Unmating Forces

Axial Force (LBS)	
MAX. Mating Force	MIN. Unmating Force
(6LBS for Ground Spring) + (Number of 23 Gauge Contacts x .50 LBS) + (Number of 16 Gauge Contacts x 1.88 LBS) + (Number of 12 Gauge Contacts x 1.88 LBS) = Total Mating Force	(3LBS for Ground Spring) + (Number of 23 Gauge Contacts x .047 LBS) + (Number of 16 Gauge Contacts x .125 LBS) + (Number of 12 Gauge Contacts x .187 LBS) = Total Unmating Force

3.9 Temperature Cycling. When tested as specified in 4.4.5, there shall be no damage detrimental to the operation of the connector.

3.10 Durability. When tested as specified in 4.4.6, the connectors shall show no defects detrimental to the operation of the connectors and shall meet the subsequent test requirements (see 4.4.6).

3.11 Altitude Immersion. When tested as specified in 4.4.7, the mated connector pair shall have a minimum insulation resistance as specified in 3.13.1 and dielectric withstanding voltage as specified in 3.14.

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QUALIFICATION TEST PLAN (QTP-406)

3.12 Insulation Resistance.

3.12.1 Insulation Resistance at Ambient Temperature. When tested as specified in 4.4.8.1, the insulation resistance between any pair of contacts and between any contact and the shell shall be greater than 5,000 megohms. Insulation resistance after altitude immersion shall be 1,000 megohms minimum. Insulation resistance after humidity shall be 100 megohms minimum.

3.12.2 Insulation Resistance at Elevated Temperature. When tested as specified in 4.4.8.2, the insulation resistance between any pair of contacts and between any contact and the shell shall be greater than 1,000 megohms for environment resisting class connectors.

3.13 Dielectric Withstanding Voltage. When tested as specified in 4.4.9.1 or 4.4.9.2, the maximum leakage current shall be 2 milliamperes, and there shall be no evidence of electric breakdown or flashover.

3.14 Insert Retention. When tested as specified in 4.4.10, unmated connectors shall retain their inserts in their proper location in the shell and there shall be no evidence of cracking, breaking, separation from the shell, or loosening of parts.

3.15 Salt Spray (corrosion). When tested as specified in 4.4.11, unmated connectors shall show no lifting of plated coating or exposure of basis material under three power (3X) magnification.

3.16 Contact Resistance. (Printed circuit board connectors only). When tested as specified in 4.4.12, contacts in the mated condition shall meet the contact resistance requirements in table V. Appropriate compensation may be made for resistance in the measured value which is due to an additional length of wire included in the measurement.

TABLE V. Contact resistance

Max Wire Size	Test Current	Voltage Drop
12	23	42
14	17	40
16	13	49
20	7.5	55
22	5	73
24	3	45
26	2	52
28	1.5	54

3.17 Contact Retention. When tested as specified in 4.4.15, the axial displacement of the contact shall not exceed .012 inch (0.30 mm). No damage to contacts or inserts shall result.

3.18 Altitude-Low Temperature. When tested as specified in 4.4.16, the connectors shall meet the requirements of dielectric withstanding voltage at sea level specified in 3.13 and insulation resistance at the ambient temperature specified in 3.12.1.

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3.19 Vibration. (Applicable at initial qualification only) When tested as specified in 4.4.17, there shall be no electrical discontinuity and there shall be no disengagement of the mated connectors, evidence of cracking, breaking, or loosening of parts.

3.20 Shock. When tested as specified in 4.4.18, there shall be no electrical discontinuity greater than 1 microsecond and there shall be no disengagement of the mated connectors, evidence of cracking, breaking, or loosening of parts.

3.21 Shell-to-Shell Conductivity. When tested as specified in 4.4.19, probes shall not puncture or otherwise damage the connector finish and the maximum measured potential drop across assemblies shall be 2.5 millivolts for plugs with spring fingers. After conditioning (salt spray) the above values may increase 100 percent.

3.22 Humidity. When tested as specified in 4.4.20, wired, mated connectors shall show no deterioration which will adversely affect performance of the connector. During the final cycle, insulation resistance shall be 100 megohms or greater.

3.23 EMI Shielding. When tested as specified in 4.4.21, the EMI shielding capabilities of mated shells with Spring fingers shall not be less than that specified in table VI at the specified frequencies.

TABLE VI. EMI shielding effectiveness.

Frequency MHz	Leakage Attenuation (dB) Minimum
100	90
200	88
300	88
400	87
800	85
1000	85
1500	69
2000	65
3000	55
4000	48
6000	43
10000	35

3.24 Fluid Immersion. When tested as specified in 4.4.22, connectors shall meet the requirements for dielectric withstanding voltage (see 3.14).

3.25 Thermal Vacuum Outgassing. All nonmetallic materials used in the finished connector shall not release greater than 1.0 percent total mass loss (TML) and 0.1 percent collected volatile condensable material (CVCM) when tested as specified in 4.4.23.

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3.26 Solderability. Solderable, non-removable contact terminations shall withstand the test specified in 4.4.24. Printed circuit tails shall meet the solderability requirements of MIL-STD-202, method 208 or an equivalent industry standard when available.

3.27 Resistance to soldering heat. Fixed, nonremovable contact connectors shall withstand the tests specified in 4.4.32.The connector shall show no evidence of distortion or damage to any area of the connector housing. Connector shall meet insulation resistance (see 3.12) and waterproof sealing requirements.

3.28 Low Level Contact Resistance. The low signal contact resistance of each mated contact pair shall not exceed the applicable values per Table VII., also specified in section 4.7.4 of Mil-C-39029 See 4.4.26.

TABLE VII. Low Level Contact Resistance.

Wire Size	Max. Milliohms
16	5
20	9
22	15
24	20
26	31
28	50

3.29 Current Rating. The current rating of the #23 and #16 contacts shall be 5.0 amps and 13.0 amps respectively when tested in accordance with EIA-364-70 Method 1. See 4.4.27.

3.30 Water Immersion. There shall be no evidence of water penetration into mated connectors when subjected to MIL-STD-810F Method 512.4 (1 meter for 1 hour). See 4.4.28.

3.31 Air Pressure. There shall be no detectable moisture. Greater than or equal to 100 MΩ insulation resistance when subjected to .4 bar overpressure for 48 hours while immerse at a depth of 150 mm in 25°C tap water in accordance with IEC-60512-7 Test 14b. See 4.4.29.

3.32. Fluid Immersion. There shall be no damage from immersion in various fuels and oils. Connectors shall be meet mating and unmating force and dielectric withstanding voltage.

3.33 Post Test Examination. Connectors shall be marked in accordance with method I of MIL-STD-1285 or an equivalent industry standard, and shall include the PIN, the manufacturer's name or code symbol, and date code. Connectors shall be processed in such a manner as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pin holes, sharp cutting edges, and other defects that will adversely affect life, serviceability, or appearance. See 4.4.31.

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4.0 VERIFICATION

4.1 Classification Of Inspection. This document describes qualification testing of the Glenair Inc. Series 79 Micro-Crimp product line.

4.2 Test Equipment and Inspection Facilities. Test, measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment (i.e., industry standard, military standard) shall be required.

4.2.1 Fungus Resistance Certification. Certification to method 508.4 of MIL-STD-810 is required (see 3.4).

4.3 Qualification Inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government on sample units produced with equipment and procedures normally used in production. Qualification approval may be granted upon successful completion of the inspections and tests of 4.4 conducted on samples of 4.3.3; such approval to include classes, finishes, shell configurations, and insert arrangements other than those actually tested providing that the capability to manufacture these parts is demonstrated by providing exhibit samples.

4.3.1 Test Connectors: Mated pairs of crimp removable cable connectors 790-024 (pin) and 790-025 (socket) in 3 insert arrangements with additional 790-027 and 790-041(socket) connector variations will be tested. The insert arrangements tested will be include side 23, 16 and 12 gauge cavities (combination).

Group 1

Serial Number	Part Number	Description	Shell Size	Backshell Required
001	790-024PA-5ML	Receptacle Cable Connector, 5 Pin	A	N/A
002	790-025SA-5MEP	Plug Cable Connectors, 5 Socket	A	N/A
003	790-024PC-13ML	Receptacle Cable Connector, 13 Pin	C	N/A
004	790-027SC-13MEP	Plug Rear Panel MT. Connector, 13 Socket	C	N/A
005	790-024PB-2P2ML	Receptacle Cable Connector, 2 Pin	B	N/A
006	790-027SB-2P2MEP	Plug Rear Panel MT. Connector, 2 socket	B	N/A

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Group 2

Serial Number	Part Number	Description	Shell Size	Backshell Required
007	790-024PG-33ML	Receptacle Cable Connector, 33 Pin	G	799-015TMG04M01
008	790-025SG-33EMP	Plug Cable Connectors, 33 Socket	G	799-015TMG04M01
009	790-025SF-5P5EML	Plug Cable Connectors, 5 Socket	F	799-015TMF06N
010	790-026PF-5P5MP	Receptacle Rear Panel MT. Connector, 5 Pin	F	799-016TMTF06N09
011	790-024PE-11P2ML	Receptacle Cable Connector, 11 Pin	E	799-015TME05N
012	790-037SE-11P2MEPA	Plug R/A PCB MT. Rear Panel MT. 11 socket	E	N/A
013	791-002PH-66MEP	Receptacle Scoop Proof Cable Connector 66 Pin	H	N/A
014	791-004SH-66ML	Plug Scoop Proof Cable Connector 66 socket	H	N/A

Group 3

Serial Number	Part Number	Description	Shell Size	Backshell Required
015	790-024PA-5ML	Receptacle Cable Connector, 5 Pin	A	N/A
016	790-025SA-5MEP	Plug Cable Connector, 5 Socket	A	N/A
017	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
018	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
019	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
020	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
021	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
022	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
023	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
024	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
025	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
026	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A

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027	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
028	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
029	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
030	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
031	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
032	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
033	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
034	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A
035	790-024PH-66ML	Receptacle Cable Connector 66 Pin	H	N/A
036	790-025SH-66EMP	Plug Cable Connector, 66 Socket	H	N/A

Group 4

Serial Number	Part Number	Description	Shell Size	Backshell Required
037	790-041PK-9P9MPA	Receptacle R/A PCB MT. 9 Pin	K	N/A
038	790-043PJ-25P2MPA	Receptacle Vertical MT. PCB 25 Pin	J	N/A
039	790-025SK-9P9EMS	Plug Cable Connector, 9 Socket	K	N/A
040	790-025SJ-25P2NMS	Plug Cable Connector, 25 Socket	J	N/A

4.3.2 Preparation Of Samples. Except as otherwise specified for shielded contacts, wiring of crimp-type contacts shall be accomplished using tools conforming to MIL-DTL-22520, class I. The length of the stripped portion of the conductor shall be at least long enough to reach the bottom of the crimp barrel, but shall not be so long that more than .010 inch of the conductor is exposed at the end of the barrel when the conductor end touches the bottom of the barrel.

a. Samples provided under 4.3.1 shall be wired with wire having a smooth extruded outer jacket of waterproof construction. See table VIII for wires to be used.

TABLE VIII. Test wire sizes

Contact Size	Wire to be loaded in connector
23	M22759/10-24
16	M22759/8-16
12	M22759/8-12

b. Connector mating hardware shall be installed with jackposts secured to the receptacle connectors and screw locks secured to the plug connectors.
c. Install all contacts with wire using isopropyl alcohol.

d. During shock and vibration, the receptacle connector shall be secured to the fixture and the plug connector shall be secured to the receptacle via screw locks to jackposts.

4.3.3 Qualification Test Groups.

Group 1 Connectors (using maximum wire)

TEST OR INSPECTION	REQUIREMENT PARAGRAPH	TEST PARAGRAPH	Serial Number	Sample Size (Mated Pairs)
Visual and Mechanical Examination	3.33	4.4.1	001-006	3
Magnetic Permeability	3.7	4.4.2	001-006	3
Temperature Cycling	3.9	4.4.5	001-006	3
Durability	3.10	4.4.6	001-006	3
Altitude Immersion	3.11	4.4.7	001-006	3
Insulation Resistance	3.12.1	4.4.8.1	001-006	3
Dielectric Withstanding Voltage	3.13	4.4.9.1	001-006	3
Insert Retention	3.14	4.4.10	001-006	3
Shell-to-Shell Conductivity	3.21	4.4.19	001-006	3
Salt Spray	3.15	4.4.11	001-006	3
Shell-to-Shell Conductivity	3.21	4.4.19	001-006	3
Post Test Examination	3.33	4.4.29	001-006	3

Group 2 Connectors (using minimum wire)

TEST OR INSPECTION	REQUIREMENT PARAGRAPH	TEST PARAGRAPH	Serial Numbers	Sample Size (Mated Pairs)
Visual and Mechanical Examination	3.33	4.4.1	007-014	4
Mating and Un-mating Force	3.8	4.4.4	007-014	4
Contact Retention	3.17	4.4.15	007-014	4
Altitude – Low Temperature	3.18	4.4.16	007-014	4
Insulation Resistance	3.12.1	4.4.8.1	007-014	4
Dielectric Withstanding Voltage	3.13	4.4.9.1	007-014	4
Insulation Resistance	3.12.2	4.4.8.2	007-014	4
Durability	3.10	4.4.6	007-014	4
Vibration	3.19	4.4.17	007-014	4
Sine Vibration	3.19	4.4.17.1	007-010	2
Random Vibration	3.19	4.4.17.2	011-014	2
Shock	3.20	4.4.18	007-014	4

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Shell to Shell Conductivity	3.21	4.4.19	007-014	4
Humidity	3.22	4.4.20	007-014	4
Insulation Resistance	3.12.1	4.4.8.1	007-014	4
Dielectric Withstanding Voltage	3.13	4.4.9.1	007-014	4
Post Test Examination	3.33	4.4.29	007-014	4

Group 3 Connectors (using maximum wire)

TEST OR INSPECTION	REQUIREMENT PARAGRAPH	TEST PARAGRAPH	Serial Numbers	Sample Size (Mated Pairs)
Visual and Mechanical Examination	3.33	4.4.1	015, 016	1
Water Immersion	3.30	4.4.28	015, 016	1
Fluid Immersion	3.32	4.4.21	017 - 036	10
Mating and Un-mating Force	3.8	4.4.4	015, 016	2
Dielectric Withstanding Voltage	3.13	4.4.9.1	017 - 036	10
Post Test Examination	3.33	4.4.29	015, 016	2

Group 4 Connectors – PC TAILS (not wired)

TEST OR INSPECTION	REQUIREMENT PARAGRAPH	TEST PARAGRAPH	Serial Numbers	Sample Size (Mated Pairs)
Visual and Mechanical Examination	3.33	4.4.1	037- 040	2
Contact Resistance	3.16	4.4.12	037- 040	2
Low Level Contact Resistance	3.28	4.4.25	037- 040	2
Current Rating	3.29	4.4.26	037- 040	2
Solderability	3.26	4.4.24	038, 040	1
Resistance to Solder Heat	3.27	4.4.25	037, 039	1
Insulation Resistance	3.12.1	4.4.8.1	037- 040	2
Post Test Examination	3.33	4.4.29	037- 040	2

4.4 Methods of Inspection.

4.4.1 Visual and Mechanical Examination.

4.4.1.1 Connectors. The connectors, accessories, and piece parts shall be visually and mechanically examined to ensure conformance with the specification and the applicable military standards (see 3.1, 3.3, 3.4, 3.5, 3.6, and 3.33). The contractor may use in-process controls to satisfy these requirements.

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4.4.1.2 Test Methods. The following identified tests and methods assure connector integrity within typical operating conditions and applications. Alternate commercial industry standard test methods are allowed when determined to provide equivalent results; however when an alternate method is used the qualifying activity must be notified prior to the performance of the test. The methods described herein are proven methods and shall be the referee methods in the event of a dispute.

4.4.2 Magnetic Permeability. See 3.7. Connectors shall be tested in accordance with test procedure EIA-364-54.

4.4.4 Mating and Unmating force. Mated connectors shall meet the requirements of table IV.
The rate of mating and unmating shall be 1 to 10 cycles per minute.

4.4.5 Temperature Cycling. See 3.9. Unmated connectors shall be subjected to 5 temperature cycles Per EIA-364-32 Test Condition VI Method A from -65°C to 150°C:

4.4.6 Durability. See 3.10. Connectors shall be tested in accordance with EIA-364-32, IEC-60512-5 Test 9a.
The wired, assembled plugs and receptacles shall be mated and unmated 500 cycles.
The mating and unmating shall be accomplished so that the plug and receptacle are completely separated during each cycle.

4.4.7 Altitude Immersion. See 3.11. Mated connectors shall be tested in accordance with test procedure Per EIA-364-03. The following details shall apply:

a. All wire ends shall be located within the chamber and exposed to the chamber atmosphere but not submerged or sealed.

b. Maximum wire size shall be used per table VIII.

c. At the end of the third cycle while the connectors are still submerged in the solution, the insulation resistance at ambient temperature shall be measured as specified in 4.4.8.1 and the dielectric withstanding voltage test shall be performed as specified in 4.4.9.1.

4.4.8 Insulation Resistance.

4.4.8.1 Insulation Resistance at Ambient Temperature. See 3.12.1. Unmated connectors shall be tested in accordance with test procedure EIA-364-21. The following details and exceptions apply:

a. For lot acceptance testing, where it is undesirable to install actual contacts in connectors, simulated contacts and special techniques may be used in performing this test.
b. The tolerance on the applied voltage shall be ±10 percent.

c. Connectors shall be mated when testing after altitude immersion, humidity and altitude low temperature

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4.4.8.2 Insulation Resistance at Elevated Temperature. See 3.12.2. Unmated connectors shall be tested in accordance with test procedure EIA-364-21. The following details and exceptions shall apply:

a. The tolerance on the applied voltage shall be ±10 percent.

b. Applicable elevated temperature for 30 minutes: 150°C +5°C/-0°C

c. Measurements shall be made while the connectors are in the chamber at the specified temperature.

4.4.9 Dielectric Withstanding Voltage. See 3.13.

4.4.9.1 Dielectric Withstanding Voltage at sea level. Wired, unmated connectors shall be tested in accordance test procedure EIA-364-20, method A. Connectors shall be mated when testing after altitude immersion humidity, and altitude low temperature. The following details and exceptions apply:

a. The magnitude of the test voltage shall be as specified in table I.

b. Fifty percent of the contacts available shall be tested, but in no case shall less than six dielectric withstanding voltage readings be taken. The test voltage shall be applied between each wired contact, and each adjacent contact, and the shell.

c. The test voltage shall be maintained at the specified value for 2 seconds minimum.

d. For quality conformance, simulated contacts and special techniques may used in performing this test

4.4.10 Insert Retention. See 3.14. Unmated connectors shall be tested in accordance with test procedure EIA-364-35 with the following details and exceptions:

a. Force to be applied: 10 pounds per square inch until 25 pounds force is reached.

b. Wire contacts can be removed for convenience of testing.

4.4.11 Salt Spray (Corrosion). See 3.15.

4.4.11.1 Standard Test. Mated connectors shall be tested in accordance with test procedure EIA-364-26, IEC 60512-11-6, with 5% salt solution at 35° C. The following details and exceptions shall apply:

a. Group 1 shall be tested for 48 hours

b. Wire ends must be protected to prevent salt migration.

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4.4.12 Contact Resistance. Applicable to printed circuit board connectors only; see paragraph 3.16. Contacts of mated connectors shall be tested in accordance with test procedure EIA-364-06.

4.4.15 Contact Retention. See 3.17 Unless otherwise specified, contacts shall be tested to procedures I and II.

4.4.15.1 Procedure I. Contact retention shall be tested in accordance with test procedure EIA-364-29. The following details and exceptions shall apply:

a. Number of samples - The test shall be performed on 20 percent of the contact complement; but not less than three contacts in each connector half.

b. Applied axial load - Preload to 3 pounds maximum, (13.6 Newtons). Apply load as specified in table X.

c. Axial direction - The applicable forces shall be applied along the longitudinal axis of individual contacts in the direction tending to displace the contacts to the rear.

d. Only the contacts to be tested need be installed in the connector.

TABLE X. Contact Retention.

Contact Size	Load ± 10 Percent	
	Min. Pounds	Min. Newtons
23	6	27
20	15	67
16	25	111
12	25	111

4.4.15.2 Procedure II. Contact retention shall be tested in accordance with test procedure EIA-364-29. The following details and exceptions shall apply:

a. 4.4.9.1a through 4.4.9.1c apply.

b. Axial direction - Same as 4.4.16.1d, except the direction shall tend to displace the contacts to the front.

c. Only the contacts to be tested need be installed in the connector.

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4.4.16 Altitude-Low Temperature. See paragraph 3.18 Wired, mated, assembled connectors shall be tested in Accordance with test procedure EIA-364-105. The following details apply:

a. No wire ends or splices inside the chamber.

b. Chamber pressure shall be reduced to simulate approximately 40,000 feet altitude (141.2 Torr).

c. 625V rms, 60Hz shall be 450V rms.

d. Insulation resistance test to be performed at 100,000 feet at -65°C, +0°C/-4°C, and shall be in accordance with 4.4.8.1.

e. Dielectric withstanding voltage test to be performed after return to ambient conditions and shall be in accordance with 4.4.9.1.

4.4.17 Vibration. Applicable at initial qualification testing only, see 3.19. Wired and mated connectors shall be subjected to the applicable test(s) specified. Connectors shall be mounted on the vibration table by normal means. All contacts shall carry a test current of 100 milliamperes maximum and shall be continuously monitored for discontinuities throughout the test. A detector capable of detecting any discontinuities in excess of 1 microsecond shall be used. All connectors shall have the wire bundles clamped to fixed points at least 8 inches (203.2 mm) behind the connector in addition to having the wires clamped at the cable exit of the backshell.

4.4.17.1 Sine Vibration. Connector samples shall be subjected to a simple harmonic motion from 10 to 2,000 Hz in each of three mutually perpendicular axes. The level of vibration shall be a velocity of 254 mm/sec from 10-50 Hz; 1.5 mm double amplitude from 50-140 Hz, 60G from 140-2,000 Hz. The entire frequency range from 10-2,000 Hz and back shall be traversed in 20 minutes. The vibration shall be applied for duration of 6 hours in each of the three mutually perpendicular axes for a total of 18 hours.

4.4.17.2 Random Vibration. Connectors shall be tested in accordance with test procedure EIA-364-28. Connectors shall be tested with specified backshell assembly 100 milliamp current 50 to 2000 Hz 43.92G rms in each of the three mutually perpendicular axes. The following details shall apply:

a. Test condition VI, letter J with wires clamed at rear exit point of connector and backshell. Wires shall be taped to prevent chaffing.

b. The vibration shall be applied for duration of 6 hours in each of the three mutually Perpendicular axes for a total of 18 hours.

c. Loctite shall be used to secure hardware.

d. Backshell required with wire taped together and wrapped around backshell banding platform.

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4.4.18 Shock. See para 3.20 Wired and mated connectors shall be subjected to the applicable test specified. Connectors shall be mounted by normal means. All contacts shall be wired in a series circuit with 100 milliamperes maximum current flow through the series circuit during shock. Connectors shall be monitored for any discontinuities. A detector capable of detecting all discontinuities in excess of 1 microsecond shall be used.

4.4.18.1 Standard Shock. Connectors shall be tested in accordance with test procedure EIA-364-27. The following details shall apply:

a. The pulse shall be an approximate half sine wave of 300G rms ±15 percent magnitude with a duration of 3 ±1 milliseconds.

b. The wire bundle shall be clamped to fixed points at least 8 inches (203.2 mm) from the rear of the connector in addition to having the wires clamped at the cable exit of the backshell

c. Backshell required with wire taped together and wrapped around backshell banding platform

4.4.19 Shell-to-Shell Conductivity. See paragraph 3.21.
Mated connectors shall be tested in accordance with test procedure EIA-364-83.

4.4.20 Humidity. See 3.22. Wired, mated connectors shall be tested in accordance with test procedure EIA-364-31. Test method IV. The following details and exceptions shall apply:

a. The mated connectors shall be mounted in a horizontal position.

b. Step 7 a shall be performed during the last 5 cycles.

c. Three hours minimum after the start of step 7a during the final cycle and while the connectors are still subjected to high humidity, insulation resistance and dielectric withstanding voltage shall be measured when the chamber temperature reaches 20°C ±5°C and condensation is observed on the connector.

d. For qualification testing, insulation resistance readings shall be made on a minimum of 50 percent of the circuits. Outer circuits shall be measured to the connector shell.

4.4.21 Fluid Immersion. See paragraph 3.24.
Connector samples shall be tested in accordance with test procedure EIA-364-10 (one sample per fluid). Following the fluid immersion cycles, the dielectric withstanding voltage at sea level shall be tested in accordance with 4.4.10.1 within 3 hours.

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4.4.22 Thermal Vacuum Outgassing. See 3.25. All materials used in the finished connector shall be tested in accordance with ASTM E595. Samples to be tested shall have been processed in the same manner as that used in production of the qualification lot.

4.4.23 Solderability. See para 3.26 Printed circuit tail terminations shall be tested in accordance with method EIA-364-52, Category 3, IEC-60512-12-1 and IEC-68-2-20 Test Ta, method 1. Connectors will undergo 8 hours of steam aging prior to test at 245°C with a 4 to 5 second dwell and 10x magnification.

4.4.24 Resistance to Solder Heat. See para 3.27 Unmated connectors with printed circuit tails shall be tested in accordance with EIA-364-56 and IEC-60512-12-5, Test 12e. Connectors shall be tested as follows:

a. The test specimens shall be fluxed accordingly with flux liquid or other techniques.

b. The solder iron shall be heated to a temperature of 260°C and shall be applied to the termination for a period necessary to hold the solder in a liquid state for a time duration of 10 seconds. Solder type to be used is Sn-63 in accordance with J-STD-006 or an equivalent industry standard.

c. After application, the soldering iron shall be removed and a visual (10x magnification) and mechanical inspection performed.

4.4.25 Low Level Contact Resistance. See paragraph 3.28. Test in accordance with EIA-364-23. 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.

4.4.26 Current Rating. See paragraph 3.29. Tested in accordance with EIA-364-70 Method 1.

4.4.27 Water Immersion. See paragraph 3.30.
Tested in accordance with MIL-STD-810F Method 512.4. 1 Meter 1 Hour.

4.4.28 Fluid Immersion. See paragraph 3.32. Tested in accordance with EIA-364-10

4.4.29 Post Test Examination. The tested connectors and contacts shall be examined for compliance with 3.3 to determine the effects of previous testing. Any evidence of cracking, loosening of parts, carbon tracking, excess wear, or missing parts shall be recorded.