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**F12 Insert for General Purpose Rectangular Connectors**

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**1. SCOPE**

## 1.1. Content

This specification defines performance, tests and quality requirements for the F12 inserts used with General Purpose Rectangular (GPR) assemblies.

## 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

## 1.3. Qualification Test Results

Successful qualification testing on the subject product line has been completed on 10JUL15. The Qualification Test Report number for this testing is 501-32033.

**2. APPLICABLE DOCUMENTS AND FORMS**

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

## 2.1. TE Documents

- [408-32138](#): Installation and Removal of F12 Sleeve Holder Used with ARINC\* 801-Compliant LuxCis\* Insert Assemblies
- [501-32033](#): F12 Insert for General Purpose Rectangular Connectors

## 2.2. Industry Documents

- BPS-C-190: Boeing Part Specification For Fiber Optic Connectors
- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- TIA-EIA-455: Test Procedures For Fiber Optic Fibers, Cables, Tr

## 2.3. Reference Document

- [109-197](#): Test Specification (TE Test Specification vs EIA and IEC Test Methods)

**3. REQUIREMENTS**

## 3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

## 3.2. Ratings

Temperature: -65 to 175°C

### 3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Examination of product	Meets requirements of product drawing and Application Specification	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing
<b>OPTICAL PERFORMANCE</b>		
Attenuation	Initial 0.5 Max. After conditioning 0.6	BPS-C-190: 5.6.3.1; TIA-EIA-455-1 71
Return Loss	Loss shall be at least 20 dB	BPS-C-190: 5.6.3.2; TIA-EIA-455-1 07
<b>MECHANICAL</b>		
Coupling/Decoupling Force	Toque $\leq$ 10 inch-pounds	BPS-C-190: 5.6.4.2; EIA-364-13 only 3 preliminary cycles
Random Vibration	No discontinuity of >1microsecond and no increase of optical loss of 3dB or greater. $\leq$ 0.25dB change in optical transmittance between initial measurement and any subsequent reading	BPS-C-190: 5.6.6.4; TIA-EIA-455-11 , Test Cond IV, letter C
Mechanical Shock	Maximum 0.25 db change in optical transmittance	BPS-C-190: 5.6.6.3; TIA-EIA-455-14, Cond A 50 g, 11 ms. half sine
Termini Retention Force	In an unmated connector shall withstand an axial load of 12 lbs and have axial displacement $\leq$ 0.015 in	BPS-C-190: 5.6.5.3
Termini Insert/Remove Force	8 lbs max for insertion and removal	BPS-C-190: 5.6.5.4
Insert Durability	See note	BPS-C-190: 5.6.5.2 10 cycles
<b>ENVIRONMENTAL</b>		
Thermal Cycling	$\leq$ 0.25 db change in optical transmittance See note	BPS-C-190: 5.6.7.1
Temperature Life	$\leq$ 0.25 db change in optical transmittance See note	BPS-C-190: 5.6.7.2; TIA-EIA-455-4, 500 hours at 100°C
Humidity	$\leq$ 0.25 db change in optical transmittance See note	BPS-C-190: 5.6.8.1 ; TIA-EIA-455-5 25C to 65C, 89 to 94% RH, 10x
Altitude Immersion	$\leq$ 0.25 db change in optical transmittance See note	BPS-C-1 90: 5.6.8.4; TIA-EIA-455-15 33.9 mbar, 3 cycles
Maintenance Aging	See note	BPS-C-190: 5.6.6.1



**NOTE**

*Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

3.4. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of product	1,14	1,7	1,16
Coupling/Decoupling Force			4
Attenuation	2,5,7,10,13	2,6	2,8,11,13,15
Return Loss		3	3
Random Vibration	8		
Mechanical Shock	9		
Termini Retention Force	3,12		5,14
Termini Insert/Remove Force	4		6
Insert Durability			7
Thermal Cycling		4	10
Temp Life		5	
Humidity	11		
Altitude Immersion			12
Maintenance Aging	6		9

**i** **NOTE**

- (a) Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. A specimen shall consist of a mated pair of GPRB2 connector shells, two mated pair of inserts (key types A and B), installed with optical termini. All test groups shall each consist of a minimal of 2 specimens.

The optical fibers for testing were LuxCis (ML) to LC multimode cable assemblies. Fibers had 50 μm multimode core, and 125 μm cladding; length is 3 meter.

- (b) Numbers indicate sequence in which tests are performed.