



**Verizon NEBS™ Compliance: Generic
Requirements for Optical Fiber Ribbon Fanouts**
Verizon Technical Purchasing Requirements
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CHANGE CONTROL RECORD:

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PREPARED BY:

Name, Title, Organization	Date
Anthony D. Kopinetz DMTS, FOC-ITL Program - NQA, SIT Verizon Technology Organization 320 St. Paul Place, Floor 14 Baltimore, MD 21202 Phone: 410-736-5060 Fax: 410-736-5144 E-mail: anthony.d.kopinetz@verizon.com	8/21/07

ISSUED BY:

Name, Title, Organization	Date
Vijay Jain M.Tech., M.A.Sc., PMP FOC-ITL Program Manager NEBS & Quality Assurance Verizon Technology Organization 320 St. Paul Place, Floor 14 Baltimore, MD 21202 Phone: 410-736-7947; Fax: 410-736-5144 E-mail: Vijay.x.jain@verizon.com	8/21/07

APPROVED BY:

Name, Title, Organization	Date
Ludwig C. Graff Director, NEBS Compliance and Quality Assurance Verizon Technology Organization Systems Integration and Testing 320 St. Paul Place, Floor 14 Baltimore, MD 21202 Phone: 410-736-5904; Fax: 410-736-5144 E-mail: ludwig.c.graff@verizon.com	8/21/07



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1.0 PURPOSE

The purpose of this Verizon Technical Purchasing Requirement document is to provide FOC testing requirements for Optical Fiber Ribbon Fanouts.

2.0 SCOPE

FOC Products

3.0 REFERENCES

Verizon PFOC Memo #8, Rev 1 – June 30, 2005	Fiber Optic Fanout Test Requirements - GR-2866 modified Punch List with Verizon Requirements.
Verizon PFOC Memo #8, Rev 1 – June 30, 2005 - Punchlist	Fiber Optic Fanout Test Requirements - GR-2866 modified Punch List with Verizon Requirements.
Verizon PFOC Memo #8, Rev 2 – Nov 8, 2005	Fiber Optic Fanout Test Requirements - GR-2866 modified Punch List with Verizon Requirements.
GR-20-CORE, Issue 2, July 1998	Generic Requirements for Optical Fiber and Optical Fiber Cables
GR-63-CORE, Issue 3, March 2006	NEBS™ Requirements: Physical Protection
GR-326-CORE, Issue 3, September 1999	Generic Requirements for Singlemode Optical Connectors and Jumper Assemblies
GR-1435-CORE, Issue 1, October 1994	Generic Requirements for Multi-Fiber Optical Connectors
GR-2866, Issue 1, June 1995	Generic Requirements for Optical Fiber Ribbon Fanouts



4.0 ACRONYMS

A	After
B	Before
D	During
FOC	Fiber Optic Components
IL	Insertion Loss
ITL	Independent Testing Laboratory
Obj	Objective
Req	Requirement

5.0 TEST REQUIREMENTS FOR OPTICAL FIBER RIBBON FANOOTS

Verizon is considering using Optical Fiber Ribbon Fanouts for all applications as required. The following are the test requirements for qualifying Optical Fiber Ribbon Fanouts. All the testing must be completed by a Verizon approved ITL.

FOC - Fiber Optic Fanout Test Plan - GR-2866			
Task Name	Sample/Group	Optical Monitoring	Comments
Fanout Testing			
Prepare Materials			
3. General Requirements			
3.1 Documentation			
3.1.1. Practices			TR454 <i>Supplier Provided Documentation</i>
3.1.2 Work Center Package			TR839 <i>Supplier Provided Training</i>
3.2 Marking, Packaging and Shipping			
3.2.1 Product Marking			TIA/EIA 598 <i>Optical Fiber</i>
3.2.2 Shipping Container			GR-63 <i>NEBS</i>
3.2.3 Package Label			
Quality			
TL9000			
3.3 Safety			
3.3 Safety			
3.4 Product Qualification and Re-Qualification			



FOC - Fiber Optic Fanout Test Plan - GR-2866			
Task Name	Sample/Group	Optical Monitoring	Comments
3.4.1 Initial Qualification and Re-Qualification			
4. General Requirements			
4.1 Ribbon Cable and Connectors			
4.1.1 Fiber Ribbon			Ribbon Must Meet GR-20 <i>Optical Fiber</i>
4.1.2 Optical Connectors			Connectors must meet GR-326 <i>Optical Connectors</i>
4.2 Tools			
4.2 Tools			No special equipment needed to install
4.3 Materials			
4.3.1 Metallic Elements			Metallic components need to be corrosion resistant and Dissimilar materials shall not be in contact with each other
Salt Fog Exposure per GR-326	A - 5 pcs.	B/A - Max IL Inc. 0.10 dB	ASTM B-117 7 days. Does not apply to all plastic products
4.3.2 Fungus	B - 3 pcs.		ASTM-G21, Rating of 0.
4.3.3 Flammability			Shall be a V-1 or better to UL-94
4.4 Physical Dimensions			
4.4.1 Ribbon	C		Ribbon fiber stub shall be 24-36 in long unless otherwise specified.
4.4.2 Fanout Housing	C		Max size 3 x 1-1/2 x 1/2 inch Req, 2-1/2x1x1/4 in. Obj, mountable Obj
4.4.3 Connector Stubs	C		Stub length shall be a min of 24 in and be supplied in 12 in increments
4.5 Furcation Stubs			
4.5.1 Tube Size	C		Req: less than 2mm diameter, Obj less than 1mm dia
4.6 Color Code			
4.6.1 Furcation Tube	C		Color needs to meet TIA/EIA 598 <i>Optical Fiber</i>
5 Performance Requirements			
5.1 Mechanical Requirements			NOTE: Samples need to go through Environmentals before Mechanicals
5.1.1 Cyclic Flexing	Group D Seq. 4 6 samples	B/A - Max Loss Inc. 0.10 dB	N/A for 900micron Furcation and ribbon cable not flexed. Applies to booted fanouts only



FOC - Fiber Optic Fanout Test Plan - GR-2866			
Task Name	Sample/Group	Optical Monitoring	Comments
5.1.2 Twist Test See GR-1435 <i>Multi Fiber Connectors</i> and GR326	Group D Seq. 5 6 samples	B/A - Max Loss Inc. 0.10 dB	Furcation Loading R is 1.65lbs Twist Individual Furcation +/- 360deg, 23C, Test Furcation side before ribbon. Ribbon Loading - R is 0.5 lb total, O is 0.25 lb per fiber, Twist Ribbon Stub +/- 180deg.
5.1.3 Tensile Strength See GR-1435 <i>Multi Fiber Connectors</i>	Group D Seq. 6 6 samples	B/D/A - Max Loss Inc. 0.10 dB	Furcation Loading R is 1.65lbs Individual Furcation 23C, Test Furcation side before ribbon. Ribbon Loading - R is 0.5 lb total, O is 0.25 lb per fiber.
5.1.4 Transmission with Applied Load	Group D Seq. 7 6 samples	B/D/A - Max Loss Inc. 0.10 dB	Furcation Loading R is 1.65lbs Individual Furcation 23C, Test Furcation side before ribbon. Ribbon Loading - R is 0.5 lb total, O is 0.25 lb per fiber, 90 deg. Loading applied to booted fanouts only.
5.2 Environmental Requirements Tests are done in series			Operation -40C (-40F) to +75C (+167F) Installation -30C (-22C) to +60C(+140F) Storage Shipping - 40C (-40F) to +75C (+167F)
5.2.1 Thermal Aging *	Group D Seq. 1 6 samples	B/D/A Max IL Inc. 0.10 dB Avg Max IL Inc. 0.15 individual Fiber	Age 85C (185F) uncontrolled RH, 7 days.
5.2.2 Temperature & Humidity Cycling *	Group D Seq. 2 6 samples	B/D/A Max IL Inc. 0.10 dB Avg Max IL Inc. 0.15 individual Fiber	Cycle -40C to +75C w/ 85%RH during + 75C, 30 days.
5.2.3 Humidity Condensation Cycle Per GR-326 *	Group D Seq. 3 6 samples	B/D/A Max IL Inc. 0.10 dB Avg Max IL Inc. 0.15 individual Fiber	Cycle -10C to +65C w/ 95%RH during, 7 days.
See the individual procedures for the number of required samples and the list of equipment regarding each test			

Optical Measurements:

B - Before

100% of Channels to be measured



FOC - Fiber Optic Fanout Test Plan - GR-2866			
Task Name	Sample/Group	Optical Monitoring	Comments
D - During		100% of Channels to be measured	
A - After		100% of Channels to be measured	
IL - Insertion Loss		IL Optical Testing @ (1310, 1490, 1550 and 1625nm) - 100% of channels	

For all optical measurements in the testing an additional allowance of 0.3dB to account for the optical connector

* - Ensure that a minimum of 3 feet of fiber ribbon and 3 feet of individual fibers are in the chamber for all-thermal testing.

Samples

If multiple products divide samples and test minimum of 3 samples of each type, must be of same product design.

Note - some tests are done in sequence
Samples - Shall be configured as deployed
Assumes GR-326 Connector on correct media type
Assumes GR-20/409 Cable