Verizon NEBS™ Compliance: Test Requirements for MDU Drop Cables

Verizon Technical Purchasing Requirements

VZ.TPR.9424

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CHANGE CONTROL RECORD:

Version	Date	Action*	Reason for Revision
1	*04/04/2008*	New	New Document
2	*8/11/08*	Add	Clarified Compact & rugged drops definition

* **New, Add, Delete, Change, Reissue**

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Table of Contents

1.0 PURPOSE

The purpose of this Verizon Technical Purchasing Requirement document is to provide test requirements to evaluate MDU Drop Cables.

2.0 SCOPE

Optical Cables

3.0 REFERENCES

GR-20-CORE, Issue 2, July 1998	Generic Requirements for Optical Fiber and Optical Fiber Cables
GR-409-CORE, Issue 1, June 1994	Generic Requirements for Premises Fiber Optic Cable
VZ.TPR.9430	Optical Fiber and Optical Fiber Cable

4.0 ACRONYMS

A	After
B	Before
D	During
FOC	Fiber Optic Components
IL	Insertion Loss
ITL	Independent Test Laboratory
MDU	Multi-Dwelling Unit
nm	Nano Meter
Pin	Input Power
RL	Return Loss

5.0 TEST REQUIREMENTS FOR MDU DROP CABLES

Verizon is considering using drop cables for MDU application. The following are test requirements for qualifying the MDU drop cables. All of the tests must be conducted at an ITL. It is assumed that fiber used in these cables is already qualified and Verizon approved.

Compact Drop Cable: Any single or multi fiber cable that will be used inside a premise with a diameter greater than equal to 900 micron meter.

Rugged Drop Cable: Any single or multi fiber cable that will be used inside a premise with a diameter greater than equal to 900 micron meter and can be stapled and handled with no deployment restrictions.

MDU Drop Cable Testing					
Description	**Reference Specification**	**Test Condition**	**Compact Drop**	**Rugged Drop**	**Indoor/Outdoor Rugged Drop**
Cable Construction					
Cable Core	GR-409, Section 6.1.1.		X	x	x
Number of Fibers per Cable	GR-409, Section 6.1.2.		X	x	x
Number of Fibers per Unit	GR-409, Section 6.1.3.		X	x	x
Sheath Removal	GR-409, Section 6.1.4.		X	x	x
Cable Marking, Packaging, and Shipping					
Cable Marking	GR-409, Section 6.2.1.		X	x	x
Cable Re-marking	GR-409, Section 6.2.2.		X	x	x
Identification Marking	GR-409, Section 6.2.3.		X	x	x
Cable Length and Length Markings	GR-409, Section 6.2.4.		X	x	x
Fiber and Unit Identification	GR-409, Section 6.2.5.		x	x	x
Packaging	GR-409, Section 6.2.6.		x	x	x
Shipping	GR-409, Section 6.2.7.		x	x	x
Mechanical Requirements					
Tensile Strength of Cable	GR-409, Section 6.3.6.	Rated tensile load specified by cable design	220 N	440 N	440 N
Low and High Temperature Cable Bend	GR-409, Section 6.3.3.	Use Riser test criteria for Rugged cable designs and General Purpose Interconnect criteria for Compact cable designs	x	x	x
Impact Resistance	GR-409, Section 6.3.4.		x	x	x
Compressive Strength	GR-409, Section 6.3.5.		x	x	x
Cable Twist	GR-409, Section 6.3.7.		x	x	x
Cable Cyclic Flexing	GR-409, Section 6.3.8.		x	x	x
Cable Materials	GR-409, Section 6.4		x	x	x
Jacket Requirements					
Outside Jacket Material	GR-409, Section 6.5.1.		x	x	x
Cable Jacket Yield Strength and Ultimate Elongation	GR-409, Section 6.5.2.		x	x	x

MDU Drop Cable Testing					
Description	**Reference Specification**	**Test Condition**	**Compact Drop**	**Rugged Drop**	**Indoor/Outdoor Rugged Drop**
Cable Outer Jacket Shrinkage	GR-409, Section 6.5.3.		x	x	x
Cable Jacket Thickness	GR-409, Section 6.4.4.		x	x	x
Environmental Requirements					
Temperature Cycling	GR-409, Section 6.6.1.	Use Interconnect/Outside Plant test criteria	x		
Cable Aging	GR-409, Section 6.6.2.		x		
Color Performance	GR-409, Section 6.6.3.		x		
Temperature Cycling	GR-20, Section 6.6.3.			x	x
Cable Aging	GR-20, Section 6.6.4.			x	x
Color Performance	GR-20, Section 6.6.6.			x	x
Flammability Listing of Premises Cables					
Plenum Cable	GR-409, Section 6.7.1.		x	x	x
Riser Cable	GR-409, Section 6.7.2.		x	x	x
General Purpose Cable	GR-409, Section 6.7.3.		x	x	x
Water Penetration	GR-20, Section 6.6.7.				x
Ionic Water Penetration	VZ.TPR.9430				x
MDU Application Tests					
Corner Bend with radius < 1 mm	n/a	Apply 2 kg load to cable to secure cable against fixture. Attenuation at 1550 nm should be ≤ 0.05 dB.	x	x	x
Corner Bend with radius < 1 mm	n/a	Apply load equal to the long term rated tensile load of the cable. Attenuation at 1550 nm should be ≤ 0.1 dB.	x	x	x

MDU Drop Cable Testing					
Description	**Reference Specification**	**Test Condition**	**Compact Drop**	**Rugged Drop**	**Indoor/Outdoor Rugged Drop**
Mandrel wrap	n/a	5 wraps around a mandrel equal to the rated minimum bend radius of the cable. Attenuation at 1550 nm should be ≤ 0.1 dB/turn.	x	x	x
T25 Staple	n/a	Secure 1 m of cable with 20 staples onto un-aged construction grade wood so that each staple is in full contact with the top of the cable. Attenuation at 1550 nm should be ≤ 0.1 dB. Perform test three times with three different operators for a total of 60 staples.		x	x
MDU Simulation	n/a	The attenuation at 1550 nm should be ≤ 0.4 dB after the following conditions are applied: -Ten 90º corner bends unloaded -One 90º corner bend w/ 2 kg load -One 90º corner bend w/ 14kg -Two 10 mm mandrel wraps -Thirty T25		x	x

MDU Drop Cable Testing					
Description	**Reference Specification**	**Test Condition**	**Compact Drop**	**Rugged Drop**	**Indoor/Outdoor Rugged Drop**
		staples			
MDU Simulation	GR-20, Section 6.5.9	Perform temperature cycling and aging of the MDU simulation to the cable's rated temperature extremes.		x	x