



**Verizon NEBS™ Compliance: NEBS
Requirements for MDU Indoor ONT**
Verizon Technical Purchasing Requirements
VZ.TPR.9507
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CHANGE CONTROL RECORD:

Version	Date	Action*	Reason for Revision
1	12/9/2008	New	New Document
2	2/6/2009	Add	Additional tests added to requirements
3	3/13/2009	Change	Document number changed to VZ.TPR.9507
	3/13/2009	Delete	Deleted Fire Resistance requirement
* New, Add, Delete, Change, Reissue			

Trademark Acknowledgement – NEBS is a trademark of Telcordia Technologies, Inc.

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1.0 **PURPOSE**

The purpose of this Verizon Technical Purchasing Requirement document is to define the minimum required NEBS testing for a MDU Indoor ONT.

2.0 **SCOPE**

This Technical Purchasing Requirement document is intended to summarize Verizon's Environmental, Electromagnetic Compliance, and Electrical Safety requirements, as well as additional requirements for all of its MDU Indoor ONT products.

The "punchlist" of tests contained herein shall be used by equipment suppliers and the Verizon approved Independent Test Laboratories as the baseline of tests to create the NEBS Test Plan. In all instances of test planning and test execution, the most recent and accepted versions of the GR standards shall be used.

Service and Architectural requirements, including power, are outside the scope of this document.

3.0 **REFERENCES**

GR-63-CORE	NEBS™ Requirements: Physical Protection
GR-78-CORE	Generic Physical Design Requirements for Telecommunications Products and Equipment
GR-1089-CORE	Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment
SIT.NEBS.TE.NPI.2004.015	Telecommunications Carrier Group NEBS Compliance Checklist
VZ.TPR.9305	Verizon NEBS Compliance Clarification Document
VZ.TPR.9503	SFU ONT Back-up Battery Reserve Time Test Plan

4.0 ACRONYMS

EMI	Electromagnetic Interference
ESD	Electro Static Discharge
EUT	Equipment Under Test
ITL	Independent Testing Laboratory
MDU	Multiple Dwelling Unit
ONT	Optical Network Terminal

5.0 DEFINITIONS

A MDU Indoor ONT is an Optical Network Terminal located inside a climate controlled and protected customer dwelling, capable of delivering voice, data and video services to a single residential customer. The ONT is intended to be mounted on a wall or table top inside the living area of the dwelling. The MDU Indoor ONT is not intended to be deployed in a garage or basement.

6.0 GENERAL REQUIREMENTS

Verizon requires that manufacturers submit their EUT and associated documentation to a Verizon approved ITL for testing and verification of conformance to the qualification test requirements in this document. For a list of Verizon approved laboratories and locations, consult the Verizon web page at <http://www.verizonnebs.com/tcpage.html>.

In addition to the specific test requirements listed below, products must comply with GR-78-CORE, *Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment*. Vendors may self-declare their product's compliance to GR-78-CORE by submitting a completed copy of Appendix C of the Telecommunication Carrier Group Checklist. Current versions of the TCG Compliance Checklist and the Verizon NEBS Clarification document can be found on the Verizon web page (<http://www.verizonnebs.com/index.html#chklist>).

In addition to the NEBS requirements, products used at a customer's premises must meet applicable UL safety standards and FCC criteria.

7.0 NEBS QUALIFICATION PLAN GUIDELINES

7.1 Equipment Test Setup Guidelines

Test configuration: The Equipment Under Test (EUT) shall be fully configured and performing its designated functions during the application of NEBS testing. The EUT and all associated documentation (installation and operating manuals), mounting and grounding schemes shall be provided to the test laboratory by the vendor prior to test commencement. All equipment interfaces (voice, video and data) shall be monitored for functionality and the test plan shall include the pass/fail criteria for each interface or service type.

7.1.1 Lightning Surge and AC Power Fault

First-Level lightning surge requirements shall apply to demonstrate performance or immunity to lightning surges and AC power faults. The ONT shall be designed to withstand lightning surges on the Telecommunications and AC power ports. To demonstrate compliance, the vendor's equipment shall be able to withstand First-Level lightning surge levels up to $\pm 5000\text{V}$ on the Telecommunications Ports. The acceptance criterion is that the equipment be capable of resuming operation after a $\pm 5000\text{V}$ lightning strike without replacement of components or human intervention.

8.0 TEST REQUIREMENTS – MDU Indoor ONT

The MDU Indoor ONT NEBS requirements need to account for the indoor environment in which they will be located. MDU Indoor ONTs will be installed inside a climate controlled and protected customer dwelling and mounted on a wall or table top inside the dwelling. The following testing is required for MDU Indoor ONTs:

Standard	Section	Required	Notes
GR-1089-CORE	Sec 2 – ESD	X	
GR-1089-CORE	Sec 3.2 – Emission Criteria	X	
GR-1089-CORE	Sec 3.3 – Immunity Criteria	X	
GR-1089-CORE	Sec. 4 – Lightning and AC Power Fault	X	Up to 5KV on telecommunications ports
GR-1089-CORE	Sec. 5 – Steady State Power Induction		
GR-1089-CORE	Sec. 6 – DC Potential Difference		
GR-1089-CORE	Sec. 7 – Electrical Safety	X	
GR-1089-CORE	Sec. 8 - Corrosion		
GR-1089-CORE	Sec. 9 – Bonding and Grounding	X	
GR-1089-CORE	Sec. 10 – DC Power Ports		
GR-63-CORE	Sec. 2 – Spatial Requirements		
GR-63-CORE	Sec. 4.1.1 – Transportation and Storage Environmental Criteria	X	
GR-63-CORE	Sec. 4.1.2 – Operating Temperature Criteria	X	Requirement: Temperature range 5 to 40°C Objective: Temperature range -5 to 50°C
GR-63-CORE	Sec. 4.1.3 – Altitude	X	Aisle-ambient up to 40°C
GR-63-CORE	Sec. 4.1.4 – Temperature Margin		
GR-63-CORE	Sec. 4.1.5 – Fan Cooling		Not Applicable – ONTs do not contain fans
GR-63-CORE	Sec. 4.1.6 – Heat Dissipation		Wattage values to be provided in TCG Checklist Section of NEBS Report
GR-63-CORE	Sec. 4.1.7 – Surface Temperature	X	
GR-63-CORE	Sec. 4.2 – Fire Resistance		
GR-63-CORE	Sec. 4.3 – Equipment Handling	X	Unpackaged drop to be performed at height of 36". Drop surface of 1" thick plywood
GR-63-CORE	Sec. 4.4.1 – Earthquake Environment and Criteria		
GR-63-CORE	Sec. 4.4.2 – Framework & Anchor		
GR-63-CORE	Sec. 4.4.3 – Wall-Mounted Anchors	X	Same Requirement as in UL-60950
GR-63-CORE	Sec. 4.4.4 – Office Vibration Environment and Criteria		
GR-63-CORE	Sec. 4.4.5 – Transportation Vibration Criteria	X	
GR-63-CORE	Sec. 4.5 – Airborne Contaminants		
GR-63-CORE	Sec. 4.6 – Acoustic Noise		
GR-63-CORE	Sec. 4.7 – Illumination		

Standard	Section	Required	Notes
VZ.TPR.9503	Battery Reserve Testing	X	
GR-78-CORE	All Applicable Sections	X	Self-Declaration – Submit Appendix C of TCG Checklist with report
UL 60950-1	All Applicable Sections	X	Provide UL 60950-1 with NEBS Report
FCC Part 15	All Applicable Sections	X	