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Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Energy Management Subcommittee**

AMERICAN NATIONAL STANDARD

ANSI/SCTE 186 2016

**Product Environmental Requirements for Cable
Telecommunications**

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Table of Contents

Title	Page Number
NOTICE	2
Table of Contents	3
1. Introduction	6
1.1. Executive Summary	6
1.2. Scope	6
1.3. Benefits	6
1.4. Intended Audience	6
1.5. Areas for Further Investigation or to be Added in Future Versions	6
1.6. Target Equipment	6
2. Normative References	6
2.1. SCTE References	7
2.2. Standards from Other Organizations	7
2.3. Published Materials	11
3. Informative References	11
3.1. SCTE References	11
3.2. Standards from Other Organizations	12
3.3. Published Materials	12
4. Compliance Notation	13
5. Abbreviations and Definitions	14
5.1. Abbreviations	14
5.2. Definitions	15
6. Physical Requirements	15
6.1. Frame and Cabinet	15
6.2. Equipment Static Load	16
6.3. Impact Force Resistance	16
6.4. Microphonic Emissions	17
6.5. Dissimilar Metals – Galvanic Compatibility	17
6.6. Equipment Labels and Markings	17
6.6.1. Packaging and Shipping Labels	17
6.6.2. ESD Labels and Documentation	17
6.7. Agency Compliance	18
6.8. Equipment Cable Routing	18
6.9. Floor Loading	18
7. Environmental Requirements	18
7.1. Climate	18
7.1.1. Transportation/Storage Temperature and Humidity	18
7.1.2. Operating Temperature and Humidity	22
7.1.3. Operating Altitude	22
7.1.4. Operating Internal Temperature Margin	23
7.1.5. Equipment Cooling Fans	23
7.1.6. Equipment Surface Temperature	23
7.2. Shock and Vibration	24
7.2.1. Packaged Equipment Free Fall Drop	24
7.2.2. Unpacked Equipment Free Fall Drop	25
7.2.3. Transportation Mechanical Shock	25
7.2.4. Transportation Mechanical Vibration	26
7.2.5. Operating Mechanical Vibration	26
7.2.6. Operating Mechanical Shock	26
7.2.7. Earthquake Resistance	27
7.3. Contaminant Resistance	27
7.3.1. Equipment Airborne Contaminant Resistance	27

7.3.2.	Solvent Resistance	27
7.4.	Equipment Safety	27
7.4.1.	Safety of Information Technology equipment	27
7.4.2.	Laser Safety	27
7.4.3.	Fire Safety	28
7.4.4.	Equipment Alarms and Automatic Shut Down	28
8.	Electrical Requirements	28
8.1.	Electromagnetic compatibility (EMC)	28
8.1.1.	Radiated Emissions	28
8.1.2.	FCC Part 15 Definitions and Clauses	28
8.1.3.	Conducted Emissions	30
8.1.4.	Immunity Criteria	30
8.2.	Grounding and Bonding	35
9.	Sustainability Requirements	35
9.1.	Product Development	36
9.1.1.	Material Efficiency	37
9.1.2.	Consumables and Batteries	37
9.2.	Product Operation	37
9.2.1.	Airflow	37
9.2.2.	Air Filters	38
9.2.3.	Heat Release	39
9.2.4.	Energy Efficiency	39
9.2.5.	Emissions	45
9.3.	Equipment Metrics for ASHRAE Expanded Data Center Operating Envelopes	46
9.4.	Product Disposal	46
10.	Quality Requirements	46
10.1.	Reliability	46
10.2.	Highly Accelerated Life Testing (HALT)	47
10.3.	Service Life Predictions	47

List of Figures

Title	Page Number
Figure 1 - Telcordia Equipment Cooling Class Nomenclature	38

List of Tables

Title	Page Number
Table 1 - Example Cabinet Dimensions	16
Table 2 - Transportation/Storage Temperature and Humidity Criteria	20
Table 3 - Thermal Shock Tests (Non-powered)	21
Table 4 - Aggravated Thermal Shock and Humidity Test Criteria	22
Table 5 - Operating Temperature and Humidity	22
Table 6 - ATIS-060004.2006 Touchable Equipment Surface Temperature Limits	24
Table 7 - Free Fall Drop Limits	25
Table 8 - Unpacked Equipment Free Fall Drop	25
Table 9 - Transportation Mechanical Shock	26
Table 10 - Transportation Mechanical Vibration	26

ANSI/SCTE 186 2016

Table 11 - Equipment Enclosure Radiated Immunity	31
Table 12 - AC Power Port Conducted RF Immunity	31
Table 13 - 4-3 AC Power Port Surge Immunity	32
Table 14 - AC Power Port Electronic Fast Transients	32
Table 15 - AC Voltage Dips	32
Table 16 - AC Voltage Interruptions	33
Table 17 - DC Power Port Conducted RF Immunity	33
Table 18 - DC Power Port Electronic Fast Transients	33
Table 19 - Telecommunications/Network Port Conducted RF Immunity	34
Table 20 - Telecommunications/Network Ports Surge Immunity	34
Table 21 - Telecommunications/Network Ports Electronic Fast Transients	35
Table 22 - Computer Server Equipment Power Supply Efficiency Requirements	43
Table 23 - Computer Server Equipment Power Supply Power Factor Requirements	44
Table 24 - Equipment Acoustical Noise Emission Limits	45

1. Introduction

1.1. Executive Summary

This specification provides physical, environmental, electrical, and sustainability requirements for equipment deployed in mission critical cable system headends, hub sites and data centers.

1.2. Scope

The specification purpose is to define product environmental and sustainability requirements 1) by referencing existing international standards; 2) by using requirements from cable operator specifications; and 3) by adding cable system specific requirements as needed. It is not the intent of this document to replace existing standards or cable operator requirements.

This specification defines product physical, environmental, electrical, and sustainability requirements during transportation, storage, operation, and disposal. The specification is limited to indoor shelf, frame, rack, and cabinet level mission critical cable systems equipment. Facilities for which this specification generally applies are network data centers and cable headends. This specification also applies to unmanned or remotely monitored distribution hubs where hub location, construction, and HVAC capabilities can result in less tightly controlled ambient operating climates and longer duration environmental stresses. The specification does not address requirements for outside cable plant equipment.

1.3. Benefits

SCTE 186 provides cable operators a single reference point that defines energy savings and sustainability requirements for inside plant cable equipment. This standard provides cable operators means to implement and require more energy and environmentally friendly equipment. Cable operators should see financial operating energy savings as a result of implementing SCTE 186.

1.4. Intended Audience

Cable operator procurement and equipment engineering teams and inside plant equipment manufacturers will benefit from leveraging this standard.

1.5. Areas for Further Investigation or to be Added in Future Versions

None at time of 2016 update.

1.6. Target Equipment

Example equipment includes CMTSSs, receivers, modulators, video encoders, multimedia gateways, servers, routers, switches, network equipment, network storage units, edge routers, add-drop multiplexors and edge QAMs. Uninterruptable Power Supplies are not in scope for this document.

2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

- ANSI/SCTE 46-2007, Test Methods for AC to DC Power Supplies
- ANSI/SCTE 81-2012, Surge Withstand Test Procedure
- ANSI/SCTE 129-2007, Drop Passives, Bonding Blocks (Without Surge Protection)
- ANSI/SCTE 158-2009, Recommended Environmental Condition Ranges for Broadband Communications Equipment
- SCTE SMS 001-2011, Facilities Energy Management and Recommended Practices 2011
-

2.2. Standards from Other Organizations

- ANSI T1.336-2009, Engineering Requirements for a Universal Telecom Framework
- ANSI/UL60950-1-2011, 2nd Edition, 2011-12-19, Information Technology Equipment-Safety-Part 1, General Requirements
- ANSI Z136.1-2014, American National Standard for Safe Use of Lasers
- ANSI Z136.2-2012, American National Standard; Safe Use of Optical Fiber Communications Systems Utilizing Laser Diode and LED Sources
- ANSI C63.4-2014, American National Standard Methods for Measurement of Radio-Noise Emissions for Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
- ANSI T1.307-2007, Fire Resistance Criteria – Ignitability Requirements for Equipment Assemblies, Ancillary Non-Metallic Apparatus, and Fire Spread Requirements for Wire and Cable
- ANSI T1.319-2002, Equipment Assemblies – Fire Propagation Risk Assessment Criteria. 2002.
- ANSI T1.319-2002, Telecom Equipment Assemblies – Fire Propagation Risk Assessment Criteria
- ASHRAE-2015, Thermal Guidelines for Data Processing Environments, Fourth Edition. 2015.
- ASHRAE-2009, Design Considerations for Datacom Equipment Centers, Second Edition. ISBN 9781933742489, 2009
- ASHRAE-2009, Best Practices for Data Center Facility Energy Efficiency, 2nd Edition, ISBN 978-1-933742-27-4, 2009
- ASHRAE Standard 52.1-1992, Gravimetric and Dust-Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter
- ASHRAE Standard 52.2 Addenda a, b and d-2015, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size, 2015
- ASHRAE TC 9.9-2011, Thermal Guidelines for Data Processing Environments – Expanded Data Center Classes and Usage Guidance
- ATIS 060004-2006, Equipment Surface Temperature
- ATIS 0600005-2006, Acoustic Noise
- ATIS 0600010.02-2012, Equipment Handling, Transportation Vibration and Rail Car Shock Requirements for Network Telecommunications Equipment

- ATIS 060015-2013, Energy Efficiency for Telecommunication Equipment, Methodology for Measurement and Reporting - General Requirements
- ATIS 060015.01-2009, Energy Efficiency for Telecommunication Equipment, Methodology for Measurement and Reporting - Server Requirements
- ATIS 060015.02-2014, Energy Efficiency for Telecommunication Equipment, Methodology for Measurement and Reporting - Transport Requirements
- ATIS 060015.03-2013, Energy Efficiency for Telecommunication Equipment, Methodology for Measurement and Reporting for Router and Ethernet Switch Products
- ATIS 060015.04-2010, Energy Efficiency for Telecommunication Equipment, Methodology for Measurement and Reporting DC Power Plant – Rectifier Requirements
- ATIS 0600307-2014, Fire Resistance Criteria – Ignitability requirements for Equipment Assemblies, Ancillary Non-Metallic Apparatus, and Fire Spread Requirements for Wire and Cable
- ATIS 0600333-2013-07, Grounding and Bonding of Telecommunications Equipment
- CEA-556-C-2005, Outer Shipping Container Label Standard.
- CEA-624-A-2002, Product Package Bar Code Label Standard for Non-Retail Applications
- 21CFR910, “OCCUPATIONAL SAFETY AND HEALTH STANDARDS”, Code of Federal Regulations, Title 29-Labor, Chapter XVII-Occupational Safety and Health Administrations, Department of Labor, Part 1920, 21CFR1910
- 21CFR1040, “PERFORMANCE STANDARDS FOR LIGHT EMITTING PRODUCTS”, Code of Federal Regulations, Title 21—Food and Drugs, Chapter 1-Food and Drug Administration, Department of Health and Human Services, Subchapter J-Radiological Health, Part 1040, 21CFG1040.10
- 29CFR1910.05, “Occupational Noise Exposure”, Code of Federal Regulations, Title 29, Part 1910, Subpart 95 (1910.95), U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), 29 CFR1910.05
- 47CFR15, “RADIO FREQUENCY DEVICES”, --Telecommunication, Chapter 1-Federal Communications Commission, Part 15-Radio Frequency Device, 47CFR15
- DIRECTIVE 2003/10/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of February, 2003 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents, noise.
- 47eCFR15-2016-02, Electronic Code of Federal Regulations (e-CFR), Title 47, Telecommunication, Part 15 – Radio Frequency Devices
- 47eCFR68-2016-02, Electronic Code of Federal Regulations (e-CFR), Title 47, Telecommunication, Part 68 – Connection of Terminal Equipment to the Telephone Network
- ECMA-109-2012, Declared Noise Emission Values of Information Technology and Telecommunications Equipment, 6th edition (December 2012)
- ECMA-74-2015, Measurement of Airborne Noise Emitted by Information Technology and Telecommunications Equipment, 13th Edition (June 2015)
- ECMA-341-2010, Environmental Design Consideration for ICT and CE Products, 4th Edition (December 2010)
- ECMA-370-2015, TED-The Echo Declaration, 5th Edition (June 2015)
- EIA-471-1996, Symbol and Label for Electrostatic Sensitive Devices

- EIA/ECA-310-E-2005, Cabinets, Racks, Panels, and Associated Equipment
- EN 300 119-1, V2.1.1-2004-2009, Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 1, Introduction and terminology
- EN 300 119-2, V2.1.2-2009-12, Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 2, Engineering requirements for racks and cabinets
- EN 300 119-3, V2.1.2-2009-12, Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 3, Engineering requirements for miscellaneous racks and cabinets
- EN 300 119-5, V1.2.2-2004-12, Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 5, Thermal Management
- ENERGY STAR®, Generalized Test Protocol for Calculating the Energy Efficiency of Internal AC-DC and DC-DC Power Supplies, Revision 6.6 (April 2012)
- ENERGY STAR®, Program Requirements for Computers. Version 6.0. October 2013
- ENERGY STAR®, Program Requirements for Computer Servers. Version 1.0. 2009
- ENERGY STAR®, Program Requirements for Computer Servers. Version 2.0. October 2013
- ENERGY STAR®, Program Requirements Product Specification for Uninterruptible Power Supplies (UPSs), Version 1.0. 2012
- Environmental Profile, Central Offices and Network Data Centers, Version 1.0 May 5, 2008, SCOPE Alliance
- ETR 100 035-February 2004, Equipment Engineering (EE); Environmental Engineering; Guidance and Terminology
- ETSI EN 300 019-1-0, V 2.1.2-2003-09, Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-0, Classification of environmental conditions; Introduction
- ETSI EN 300-019-1-1 V2.1.4-2003-2004, Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment, Part 1-1, Classification of environmental conditions; Storage
- ETSI EN 300-019-1-2, V2.1.4-2003-04, Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment, Part 1-2, Classification of environmental conditions; Transportation
- ETSI EN 300 019-1-3, v2.3.2-2009-11, Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3, Classification of environmental conditions; Stationary use at weatherprotected locations
- ETSI EN 300 019-2-0, V 2.1.2-2003-09, Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-0, Specification of environmental tests; Introduction
- ETSI EN 300 019-2-1, V 2.1.6-2014-06, Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-1, Specification of environmental tests; Storage
- ETSI EN 300 019-2-2, V 2.1.2-2011-1, Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-2, Specification of environmental tests; Transportation

- ETSI EN 300 019-2-3, V 2.3.7-2015-09, Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-3, Specification of environmental tests; Stationary use at weatherprotected locations
- ETSI EN 300 132-1, September 1996, Environmental Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 1, Operated by alternating current (ac) derived from direct current (dc) sources
- ETSI EN 300 386, V1.4.1-2007-10, Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Telecommunications Network Equipment; ElectroMagnetic Compatibility (EMC) Requirements
- ETSI ES 201 468 V1.5.1-2005-08, Additional Electromagnetic Compatibility (EMC) requirements and resistibility requirements for telecommunications equipment for enhanced availability of service in specific applications
- ETSI ETR 127-March 1994, Equipment Engineering (EE); Electrostatic environment and mitigation measures for Public Telecommunications Network (PTN)
- ETSI ETR 300 753 V1.2.1-2009-03, Equipment Engineering (EE); Acoustic noise emitted by telecommunications equipment
- ETSI TR 102 489, V1.1.1-2004-06, Environmental Engineering (EE); European telecommunications standard for equipment practice; Thermal Management Guidance for equipment and its deployment
- GR-63-CORE, Issue 3-March 2006, NEBS™ Requirements, Physical Protection.
- GR-1089-CORE, Issue 6-August 2011, Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment
- GR-3028-CORE, Issue 1-December 2001, Thermal Management in Telecommunications Central Offices
- GR-3160-CORE Issue 2-July 2013; NEBS™ Requirements for Telecommunications Data Center Equipment and Spaces
- IEC 60068-2-2 5th edition-2007-07, Environmental testing - Part 2, Tests
- IEC 60068-2-27 4th edition-2008-02, Environmental testing – Part 2-27, Tests – Ea and guidance, Shock
- IEC 60721-3-3 2.2nd edition-2002, Classification of environmental parameters and their severities - Stationary use of weather-protected locations
- IEC 60825-1 3rd edition-2014, Safety of laser products - Part 1, Equipment classification and requirement
- IEC 60950-1,2005+AMD1,2009+AMD2,2013, 2nd edition, 2013-05, Safety of information technology equipment including electrical business equipment
- IEC 61000-3-2 4th edition-2014-05, Electromagnetic Compatibility (EMC) – Part 3-2, Limits – Limits for harmonic current emissions (equipment input current $\leq 16A$ per phase)
- IEC 61000-3-3,2013 3rd edition-2013-05, (EMC) – Part 3-3, Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16A$ per phase and not subject to conditional connection
- IEC 61000-4-2,2008 2nd edition-2008-12, Electromagnetic Compatibility (EMC) – Part 4-2, Testing and measurement techniques – Electrostatic discharge immunity test

- IEC 61000-4-3, 3.2nd edition-2010-04, Electromagnetic Compatibility (EMC) – Part 4-3, Testing and measurement techniques – radiated, radio-frequency, electromagnetic field immunity test
- IEC 61000-4-4, 2012 RLV 3rd edition-2012-04, Electromagnetic Compatibility (EMC) – Part 4-4, Testing and measurement techniques – Electrical fast transient/burst immunity test
- IEC 61000-4-5, 2014 3rd edition-2014-05, Electromagnetic Compatibility (EMC) – Part 4-5, Testing and measurement techniques – Surge immunity test
- IEC 61000-4-6, 2013 4th edition-2013-10, Electromagnetic Compatibility (EMC) – Part 4-6, Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
- IEC 61000-4-8, 2009 RLV 2nd edition-2009-09, Electromagnetic Compatibility (EMC) – Part 4-8, Testing and measurement techniques – Power frequency magnetic field immunity test
- IEC 61000-4-11 2nd edition-2004-03, Electromagnetic Compatibility (EMC) – Part 4-11, Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests
- IEEE C62.41.1 2nd edition-2008, Guide on the Surge Environment in Low-Voltage (1000V and less) AC power circuits
- ISO/IEC DIS 2836 3rd edition 2016-02, Information Technology – Office Equipment – Determination of Chemical Emission Rates from Electronic Equipment
- JESD-471-2009, Symbol and Label for Electrostatic Sensitive Devices
- MIL-STD 810d, method 507.2 Procedure III-Aggravated
- NGAA Converged Multiservice Access Platform Product Specification, August 2010, Hardware & Functional Specification
- (RoHS) DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous Substances in electrical and electronic equipment (recast)
- SR-332 Issue 3, January 2011, Updated February 2011, Reliability Prediction Procedure for Electrical Equipment
- (WEEE) DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE) (and latest associated amendments)

2.3. Published Materials

- No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

- No informative references are applicable.

3.2. Standards from Other Organizations

- ANSI/TIA 942-2015: Telecommunications Infrastructure Standard for Network Data Center.
- ANSI/TIA-968-B-2009: Telecommunications - Telephone Terminal Equipment – Technical Requirements for Connection of Terminal Equipment to the Telephone Network.
- ASHRAE: Datacom Equipment Power Trends and Cooling Applications, Second Edition, ISBN 9781936504282 2012
- ASHRAE: Design Considerations for Datacom Equipment Centers, Second Edition, ISBN 9781933742489, 2009
- ASHRAE: Liquid Cooling Guidelines for Datacom Equipment Centers, ,Second Edition ISBN 9781936504671, 2013
- ASHRAE: Structural and Vibration Guidelines for Datacom Equipment Centers, ISBN 9781933742205,2008
- ATIS-0600319.2014-2014: Equipment Assemblies -- Fire Propagation Risk Assessment Criteria.
- ATIS-PP-0600315.2013: Voltage Levels for DC-Powered Equipment Used in the Telecommunications Environment
- DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (and 2008/C 28/01 for harmonized stand)
- (EMC) DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility
- EN 300 119-4 V2.1.1-2004-09: Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 4: Engineering requirements for subracks in miscellaneous racks and cabinets
- ETSI EN 300 132-2 V2.4.6-2011-10: Power supply interface at the input to the telecommunications and datacom (ICT) equipment; Part 2: Operated by -48V direct current
- ETSI EN 300 132-3 V2.1.1-2011-10: Environmental Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 3: Operated by rectified current source, alternating current source or direct current source up to 400V
- ETSI EN 300 253 V2.2.1-2015-06: Equipment Engineering (EE); Earthing and bonding of telecommunications equipment in telecommunication centres
- TIA-569-B-2004: Commercial Building Standard for Telecommunications Pathways and Spaces

3.3. Published Materials

- GR-78-CORE Issue 2-September 2007: Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment
- GR-295 Issue 1-November 2004: Mesh and Isolated Bonding Networks: Definition and Application to Telephone Central Offices
- GR-383-CORE Issue 3-February 2006: Common Language Equipment Codes (CLEI Codes) – Generic Requirements for Product Labels
- GR-485-CORE Issue 5-April 2004: Common Language Equipment Codes (CLEI Codes) – Generic Requirements for Processes and Guidelines

- GR-1275-CORE Issue 12-December 2010: Central Office/Network Environment Equipment Installation / Removal Generic Requirements
- GR-1502-CORE Issue 9-December 2010: Central Office / Network Environment Detail Engineering Generic Requirements
- GR-2914-CORE Issue 4-December 1998: Human Factors Requirements for Equipment to Improve Network Reliability
- “Information technology equipment including electrical business equipment”: European Norm, European Committee for Electrotechnical Standardization (CENELEC)
- Recommendations for Measuring and Report Overall Data Center Efficiency
- SCOPE AdvancedTCA™ HW Profile, Version 2.0-2007
- SCOPE MicroTCA™ HW Profile, Version 1.0-2007
- SCOPE Services and Support Profile Service Availability, Version 1.0-2007
- SCOPE Services and Support Profile Long Life Cycle Support, Version 1.0-2007
- GR-78-CORE Issue 2-September 2007: Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment
- SR 3580 Issue 5 FR-2063 NEBS Criteria Levels-2012-05: A module of NEBSFR, Telcordia Technologies Special Report
- Usage and Public Reporting Guidelines for PUE/DCiE – WP #2-2009
- VZ.TPR.9205 Issue 5-2011-10: Verizon Technical Purchasing Requirements

4. Compliance Notation

<i>shall</i>	This word or the adjective “ <i>required</i> ” means that the item is an absolute requirement of this document.
<i>shall not</i>	This phrase means that the item is an absolute prohibition of this document.
<i>forbidden</i>	This word means the value specified shall never be used.
<i>should</i>	This word or the adjective “ <i>recommended</i> ” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
<i>should not</i>	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
<i>may</i>	This word or the adjective “ <i>optional</i> ” means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
<i>deprecated</i>	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

5. Abbreviations and Definitions

5.1. Abbreviations

AC	Alternating Current
ADM	Add-drop Multiplexer
ASTM	American Society for Testing and Materials
ANSI	American National Standards Institute
ASD	Acceleration Spectral Density
ASHRAE	American Society of Heating, Refrigerating and Air-conditioning
ATIS	Alliance for Telecommunications Industry Solutions
BER	Bit Error Rate
BOB	Buffered on Board
CENELEC	European Committee for Electrotechnical Standardization
CFM	Cubic Foot per Minute
CFR	Code of Federal Regulations (US)
CE	Consumer Electronics
CISPR	Special International Committee on Radio Interference
DC	Direct Current
DCS	Digital Cross Connect Systems
DIMM	Dual In-line Memory Module
eCFR	Electronic Code of Federal Regulations (US)
EC	European Community
ECC	Error-correcting Code
ECMA	Ecma International® (formerly European Computer Manufacturers Association)
EFT	Electronic Fast Transient
EIA	Electronic Industries Alliance
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ETSI	European Telecommunications Standards Institute
EUT	Equipment Under Test
ICT	Information and Communication Technology
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IP	Internet Protocol
ISDN	Integrated Services Digital Network
IT	Information Technology
ITE	Information Technology Equipment
ITU	International Telecommunication Union
MPEG	Motion Picture Experts Group
MSO	Multiple System Operator
PDA	Personal Digital Assistant
PSTN	Public Switched Telephone Network
OEM	Original Equipment Manufacturer
OS	Operating System
OSHA	Occupational Safety and Health Administration (US Dept. of Labor)

OSP	Outside Plant
QAM	Quadrature Amplitude Modulation
RAM	Random-access Memory
ROADM	Reconfigurable Optical Add-drop Multiplexer
RoHS	Restriction of Hazardous Substances
SCTE	Society of Cable Telecommunications Engineers
SDH	Synchronous Digital Hierarchy
SONET	Synchronous Optical Network
SMS	Sustainability Management Subcommittee
SPEC	Standard Performance Evaluation Corporation
TCG	Telecommunications Carrier Group
TEER	Telecommunications Energy Efficiency Ratio
TIA	Telecommunications Industry Association
U	Unit, Short for Rack-Unit, Measure of vertical rack space, 1U=1.75" (44.45mm)
USB	Universal Serial Bus
UPS	Uninterruptible Power Supply
WDM	Wavelength-division Multiplexer

5.2. Definitions

Downstream	Information flowing from the hub to the user
Upstream	Information flowing from the user to the hub

6. Physical Requirements

6.1. Frame and Cabinet

- Equipment frames and cabinets *should* comply with international standards for uniform frameworks.
- Open racks *should* comply with EIA/ECA-310-E-2005: Cabinets, Racks, Panels, and Associated Equipment.
- Recommended open rack dimensions are:¹
 - Height: 2130 mm (84 in)
 - Width: 560 mm (23 in) for 19-inch equipment
 - 660 mm (26 in) for 23-inch equipment
 - Depth: 300 (12 in) with extenders to support wider depth equipment as needed
- Closed frames, cabinets and equivalent frameworks *should* comply with **ANSI T1.336-2009: Engineering Requirements for a Universal Telecom Framework**. Noteworthy criteria specified in ANSI T1.336-2009 includes:
Cabinet outer dimensions based on **EN 300 119-2, V2.1.2-2009-12, Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 2, Engineering requirements for racks and cabinets** and **EN 300 119-3, V2.1.2-2009-12, Environmental Engineering (EE); European telecommunications standard for equipment practice; Part 3, Engineering requirements for miscellaneous racks and cabinets**
 - Widths: 600, 750, 900 mm (23.62, 29.52, 35.43 inches)

¹ These are the open rack dimensions recommended in **GR-63-CORE** for central offices and equivalent facilities.