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Environmental Engineering (EE) - Environmental conditions and environmental tests for telecommunications equipment - Part 2-8: Specification of environmental tests; Stationary use at underground locations

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19.040	Preskušanje v zvezi z okoljem	Environmental testing
33.050.01	Telekomunikacijska terminalska oprema na splošno	Telecommunication terminal equipment in general

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Environmental Engineering (EE), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document is part 2, sub-part 8 of a multi-part deliverable. Full details of the entire series can be found in part 2, sub-part 0 [i.1].

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Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document specifies test methods and severities for verification of the required resistibility of equipment according to the relevant environmental class.

The tests defined in the present document apply to stationary use at underground locations covering the environmental conditions stated in ETSI EN 300 019-1-8 [1].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

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The following referenced documents are necessary for the application of the present document.

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[1] ETSI EN 300 019-1-8 (04-2003): "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-8: Classification of environmental conditions; Stationary use at underground locations".

[2] IEC 60068-2-1 (03-2007): "Environmental testing - Part 2-1: Tests - Test A: Cold".

[3] IEC 60068-2-17 (07-1994): "Basic environmental testing procedures - Part 2-17: Tests - Test Q: Sealing".

[4] Void.

[5] ATIS T1.0600329 (2014): "Network Equipment - Earthquake Resistance".

[6] Void.

[7] IEC 60068-2-2 (07-2007): "Environmental testing - Part 2-2: Tests - Test B: Dry heat".

[8] IEC 60068-2-14 (01-2009): "Environmental testing - Part 2-14: Tests - Test N: Change of temperature".

[9] IEC 60068-2-30 (08-2005): "Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)".

[10] IEC 60068-2-64 (04-2008): "Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance".

[11] IEC 60068-2-27 (02-2008): "Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock".

[12] IEC 60068-2-6 (12-2007): "Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)".

[13] IEC 60068-2-57 (04-2013): "Environmental testing - Part 2-57: Tests - Test Ff: Vibration - Time-history and sine-beat method".

[14] Void.

[15] Void.

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[16] IEC 60068-2-78 (10-2012): "Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state".

[17] Void.

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI EN 300 019-2-0: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-0: Specification of environmental tests; Introduction".

[i.2] IEC 60068-2-68 (08-1994): "Environmental testing - Part 2-68: Tests - Test L: Dust and sand".

[i.3] IEC 60068-2 (all parts): "Environmental testing - Part 2: Tests".

[i.4] ETSI EN 300 019-1-0: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-0: Classification of environmental conditions; Introduction".

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3 Definition of terms, symbols and abbreviations

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3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 300 019-1-0 [i.4] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in ETSI EN 300 019-1-0 [i.4] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 300 019-1-0 [i.4] apply.

4 Environmental test specifications

4.0 General

The equipment shall be tested in its operational state throughout the test conditions described in the present document. The detailed descriptions of the environmental conditions shall refer to clauses 4 and 5 of ETSI EN 300 019-1-8 [1].

ETSI EN 300 019-2-0 [i.1] forms a general overview of part 2 of this multi-part deliverable.

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4.1 Equipment setup and configuration

The equipment shall be tested in its operational state throughout the test conditions described in the present document unless otherwise stated. Input and load conditions of the equipment shall be chosen to obtain full utilization of the equipment under test. The heat dissipation shall be maximized, except for the steady state, low temperature test, where it shall be minimized.

4.2 Performance criteria

The following performance criteria shall apply in the tests defined by the present document.

Performance criterion A:

The equipment shall function according to the manufacturer specifications before, during and after the tests. No degradation of performance or loss of function is allowed below the performance level specified by the manufacturer when the equipment is used as intended. If the minimum performance level is not specified by the manufacturer, then this may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion B:

The equipment shall function according to the manufacturer specifications before and after the tests. During the test it is not required to monitor the equipment functionality. No degradation of performance or loss of function is allowed below the performance level specified by the manufacturer when the equipment is used as intended. If the minimum performance level is not specified by the manufacturer, then this may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

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Performance criterion C:

The equipment shall function according to the manufacturer specifications before and after the tests. No degradation of performance or loss of function is allowed below the performance level specified by the manufacturer when the equipment is used as intended. If the minimum performance level is not specified by the manufacturer, then this may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

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During the application of the test, temporary loss of function is allowed but after the test the equipment shall restore to the normal functionality without replacement of components, manual rebooting or human intervention.

The equipment shall sustain the test without permanent structural or mechanical damage.

Performance criterion D:

This performance criterion applies to the enclosure of the equipment. No corrosion traces (e.g. rust) or deterioration of the enclosure shall occur at the end of the test.

4.3 Specification T 8.1: Partly weatherprotected underground locations

The present document shall apply to underground enclosures in footway boxes, manholes and some tunnels etc. which are protected from direct weather influences. The location has no temperature or humidity control, but the variations in the temperature are limited due to the stabilizing influence of the surroundings. The equipment may be immersed in water during exceptional conditions.

Table 1: Test specification T 8.1: Partly weatherprotected underground locations - climatic tests

Environmental parameter			Environmental Class 4.1	Environmental test specification T 4.1: Stationary use, Non-weatherprotected locations					
Type	**Parameter**	**Detail parameter**	**Characteristic severity**	**Test severity**	**Duration**	**Reference**	**Method**	**Performance criterion**	**Notes**
Air temperature	Low	(°C)	-10	-10	16 h	IEC 60068-2-1 [2]	Ab/Ad/Ae: Cold	A	
	High	(°C)	+40	+40	16 h	IEC 60068-2-2 [7]	Bb/Bd/Be: Dry heat	A	
	Change	(°C) (°C/min)	5	-10 to +40 0,5	2 cycles t_1 = 3 h	IEC 60068-2-14 [8]	Nb: Change of temperature with specified rate of change	A	1
Humidity	Relative	Low (%)	5	None					2
		High (%) (°C)	100	93 +30	21 d	IEC 60068-2-78 [16]	Cb: Damp heat Steady state	A	3
		Condensation (%) (°C)	Yes	90 to 100 +40	2 cycles	IEC 60068-2-30 [9]	Db: Damp heat, cyclic Variant 1	A	4
	Absolute	Low (g/m^3)	0,5	None					2
		High (g/m^3)	23	None					5
Air	Pressure	Low (kPa)	70	None					6
		High (kPa)	106	None					6
	Speed	(m/s)	1	None					2
Water	Rain	Intensity	None						
		Low temperature (°C)	None						
	Other sources	(m) (kPa)	dripping water condensed water immersion to soil water	2 19,6	1h	IEC 60068-2-17 [3]	Qf: Immersion	A	7
	Icing & frosting		Yes	None					2
Radiation	Solar	(W/m^2)	None	None					
	Heat	(W/m^2)	Yes	None					8
Chemically active substances	Sulphur	SO_2 (mg/m^3)	0,3 to 1,0	None					9
		H_2S (mg/m^3)	0,1 to 0,5	None					9
	Chlorine	Salt mist	Sea and road salt	None					9
		Cl (mg/m^3)	0,1 to 0,3	None					9
		HCl (mg/m^3)	0,1 to 0,5	None					9
	Nitrogen	NO_x (mg/m^3)	0,5 to 1,0	None					9
		NH_3 (mg/m^3)	1,0 to 3,0	None					9
	Hydrogen fluoride HF	(mg/m^3)	0,01 to 0,03	None					9
	Ozone O_3	(mg/m^3)	0,05 to 0,1	None					9

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