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Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-7: Specification of environmental tests; Portable and non-stationary use

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European Standard (Telecommunications series)

**Environmental Engineering (EE);
Environmental conditions and environmental tests
for telecommunications equipment;
Part 2-7: Specification of environmental tests;
Portable and non-stationary use**

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Environmental Engineering (EE).

The present document is part 2, sub-part 7 of a multi-part deliverable covering environmental conditions and environmental tests for telecommunications equipment, as identified below:

Part 1: "Classification of environmental conditions";

Part 2: "Specification of environmental tests";

Sub-part 0: "Introduction";

Sub-part 1: "Storage";

Sub-part 2: "Transportation";

Sub-part 3: "Stationary use at weatherprotected locations";

Sub-part 4: "Stationary use at non-weatherprotected locations";

Sub-part 5: "Ground vehicle installations";

Sub-part 6: "Ship environments";

Sub-part 7: "Portable and non-stationary use";

Sub-part 8: "Stationary use at underground locations".

Part 1 specifies different standardized environmental classes covering climatic and biological conditions, chemically and mechanically active substances and mechanical conditions during storage, transportation and in use.

Part 2 specifies the recommended test severities and test methods for the different environmental classes.

Part 2-0 forms a general overview of part 2. The present document deals with portable and non-stationary use.

National transposition dates

Date of adoption of this EN:	29 November 2002
Date of latest announcement of this EN (doa):	28 February 2003
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2003
Date of withdrawal of any conflicting National Standard (dow):	31 August 2003

1 Scope

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

The tests defined in the present document apply to portable and non-stationary use of equipment, covering the environments stated in EN 300 019-1-7 [1].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

- [1] ETSI EN 300 019-1-7: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-7: Classification of environmental conditions; Portable and non-stationary use".
- [2] IEC 60068-2 (all parts): "Environmental testing - Part 2: Tests".
- [3] ETSI ETS 300 019-2-0: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-0: Specification of environmental tests; Introduction".
- [4] ISO 4180-2 (1980): "Complete, filled transport packages - General rules for the compilation of performance test schedules - Part 2: Quantitative data".

3 Environmental test specifications

The detailed descriptions of the environmental conditions are given in clauses 4 and 5 of EN 300 019-1-7 [1].

ETS 300 019-2-0 [3] forms a general overview of part 2 of the present document.

The equipment under test is assumed to be in its operational state throughout the test conditions described in this part unless otherwise stated. The required performance before, during and after the test needs to be specified in the product specification. 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.

3.1 Specification T 7.1: Temperature-controlled locations

This specification applies to use at, and direct transfer between, permanently temperature-controlled enclosed locations where humidity is usually not controlled. See tables 1, 5 and 6.

Table 1: Test specification T 7.1: Temperature-controlled locations - climatic tests

Environmental parameter			Environmental Class 7.1	Environmental test specification T7.1: Portable, Temperature - controlled location					
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes	
Air temperature	low	(°C)	+5	+5	16 h	IEC 60068-2-1 [2]	Ab/Ad: Cold	1	
	high	(°C)	+40	+40 or +50	16 h	IEC 60068-2-2 [2]	Bb/Bd: Dry heat	2	
	change	(°C)	+5/+25	+5/+25	3 cycles t ₁ = 3 h	IEC 60068-2-14 [2]	Na: Change of temperature	3	
Humidity	relative	low	(%)	5	none			4	
		high	(%)	85	93	96 h	IEC 60068-2-56 [2]	Cb: Damp heat steady state	5
		condensation	(°C)	+30	+30				
	absolute	low	(g/m ³)	yes	90-100	2 cycles	IEC 60068-2-30 [2]	Db: Damp heat Cyclic, variant 2	6
		high	(g/m ³)	1	none				4
Air	pressure	low	(kPa)	70	none			8	
		high	(kPa)	106	none			8	
	speed	(m/s)	5,0	none				4	
Water	rain	intensity	(mm/min)	no					
		low temperature	(°C)	no					
	other sources icing & frosting		no						
Radiation	solar	(W/m ²)	700	none				11	
	heat	(W/m ²)	600	none				11	
Chemically active substances	sulphur	SO ₂	(mg/m ³)	0,3/1,0	none			12	
		H ₂ S	(mg/m ³)	0,1/0,5	none			12	
	chlorine	salts		Sea and road salt mist	none			12	
		Cl ₂	(mg/m ³)	0,1/0,3	none			12	
		HCl	(mg/m ³)	0,1/0,5	none			12	
	nitrogen	NO _x	(mg/m ³)	0,5/1,0	none			12	
		NH ₃	(mg/m ³)	1,0/3,0	none			12	
	hydrogen fluoride	HF	(mg/m ³)	0,01/0,03	none			12	
ozone	O ₃	(mg/m ³)	0,05/0,1	none			12		

Environmental parameter			Environmental Class 7.1	Environmental test specification T7.1: Portable, Temperature - controlled location				
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes
Mechanically active substances	dust	sedimentation (mg/(m ² h))	1,5	none				13
		suspension (mg/m ³)	0,2	none				13
	sand (mg/m ³)	30	none					13
Flora and Fauna	micro organisms		no					
	rodents, insects		no					
no: This condition does not occur in this class.								
none: Verification is required only in special cases.								
NOTES: Number of note, see clause 3.4.								

3.2 Specification T 7.2: Partly temperature-controlled locations

This specification applies to use at and direct transfer between, enclosed locations having neither temperature nor humidity control but where heating may be used to avoid low temperatures. Building construction avoids extremely high temperatures. See tables 2, 5 and 6.

Table 2: Test specification T 7.2: Partly temperature-controlled locations - climatic tests

Environmental parameter			Environmental Class 7.2	Environmental test specification T7.2: Portable, Partly temperature- controlled locations				
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes
Air temperature	low	(°C) -5	-5	-5	16 h	IEC 60068-2-1 [2]	Ab/Ad: Cold	1
		(°C) +45	+45 or +55	+45 or +55	16 h	IEC 60068-2-2 [2]	Bb/Bd: Dry heat	2
	change	(°C) -5/+25	-5/+25	-5/+25	3 cycles t ₁ = 3 h	IEC 60068-2-14 [2]	Na: Change of temperature	3
Humidity	relative	low (%) 5	none					4
		high (%) 95	93 +30	96 h	IEC 60068-2-56 [2]	Cb: Damp heat steady state	5	
		condensation (%) yes	90-100 +30	2 cycles	IEC 60068-2-30 [2]	Db: Damp heat Cyclic, variant 2	6	
	absolute	low (g/m ³) 1	none					4
		high (g/m ³) 29	none					7
Air	pressure	low (kPa) 70	none					8
		high (kPa) 106	none					8
	speed (m/s) 5,0	none					4	
Water	rain	intensity (mm/min) no						
		low temperature (°C) no						
	other sources	dripping water	none					10
	icing & frosting	yes	none					4