



SLOVENSKI STANDARD
SIST EN 300 019-2-5 V2.1.2:2006
01-februar-2006

Okoljski inženiring (EE) – Okoljski pogoji in preskusi vplivov okolja na telekomunikacijsko opremo – 2-5. del: Specifikacija preskusov vplivov okolja – Inštalacije v kopenskih vozilih

Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-5: Specification of environmental tests; Ground vehicle installations

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Ta slovenski standard je istoveten z: EN 300 019-2-5 Version 2.1.2

ICS:

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

SIST EN 300 019-2-5 V2.1.2:2006 en

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ETSI EN 300 019-2-5 V2.1.2 (2001-09)

European Standard (Telecommunications series)

**Environmental Engineering (EE);
Environmental conditions and environmental tests for
telecommunications equipment;
Part 2-5: Specification of environmental tests;
Ground vehicle installations**

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Reference

REN/EE-01027-2-5

Keywords

environment, mobile, terrestrial, testing

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Sous-Préfecture de Grasse (06) N° 7803/88

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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 5 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 ground vehicle installations.

National transposition dates

Date of adoption of this EN:	14 September 2001
Date of latest announcement of this EN (doa):	31 December 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 June 2002
Date of withdrawal of any conflicting National Standard (dow):	30 June 2002

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 in the present document apply to the use of equipment installed permanently or temporarily in ground vehicles and cover the vehicles and the environmental conditions stated in ETS 300 019-1-5 [1].

The tests cover installations in vehicles powered by electric motors and combustion engines. Applications in combustion engine compartments are excluded.

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.

- [1] ETSI ETS 300 019-1-5: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-5: Classification of environmental conditions; Ground vehicle installations".
- [2] IEC 60068-2: "Environmental testing - Part 2: Tests".
- [3] ETSI ETS 300 019-2-0: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-0: Specification of environmental tests; Introduction".

3 Environmental test specifications

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

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

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 5.1: Protected installation

This specification applies to use in weatherprotected heated locations in vehicles which are used in areas with or without well developed road systems depending on the selected IEC mechanical class. See tables 1, 2 and 2a.

Table 1: Test specification T 5.1: Protected installation - climatic tests

Environmental parameter			Environmental Class 5.1	Environmental test specification T5.1: Vehicle, protected installation					
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes	
Air temperature	low	(°C)	-25	-25	16 h	IEC 60068-2-1 [2]	Ab/Ad: Cold	1	
	high	(°C)	+40 a), e)	+40 or +55	16 h	IEC 60068-2-2 [2]	Bb/Bd: Dry heat	2	
		(°C)	+70 b), c)	+70 or +85	16 h	IEC 60068-2-2 [2]	Bb/Bd: Dry heat	2	
	change	rapid	(°C)	-25/+30	none				3a
		gradual	(°C/min)	-25/+30 not c)	-25/+30	5 cycles t ₁ = 3 h	IEC 60068-2-14 [2]	Na: Change of temperature	3b
Temperature	change	air/water	(°C)	no not c)					
		air/water	(°C)	+60/+5 c)	none			4	
		air/snow	(°C)	+60/-5 c)					
Humidity	relative	slow temperature change	(%)	95	93	96 h	IEC 60068-2-56 [2]	Cb: Damp heat, steady state	5
			(°C)	+40	+40				
		rapid temperature change	(%)	95 not d)	90-100	2 cycles	IEC 60068-2-30 [2]	Db: Damp heat, cyclic, Variant 2	6
			(°C)	-25/+30	+40				
			(%)	95 d)	90-100	2 cycles	IEC 60068-2-30 [2]	Db: Damp heat, cyclic, Variant 2	6
		(°C)	+10/+70	+55					
	absolute	low	(%)	10	none			8	
			(°C)	+30					
		rapid temperature change	(g/m ³)	60	none			7	
			(°C)	+70/+15					
Air	pressure	low	(kPa)	70	none			9	
	speed		(m/s)	20	none			8	
Water	rain	Intensity	(mm/min)	no					
	other sources	velocity	(m/s)	0,3	none			8	
	wetness			wet surfaces	none			8,12	
Radiation	solar		(W/m ²)	700				13	
	heat		(W/m ²)	600				13	

Environmental parameter			Environmental Class 5.1	Environmental test specification T5.1: Vehicle, protected installation					
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes	
Chemically active substance	sulphur	SO ₂ (mg/m ³)	0,3 / 1,0	none				14	
		H ₂ S (mg/m ³)	0,1 / 0,5	none				14	
	chlorine	sea salts		salt mist	none				14
		road salts		solid salt, salt water	none				14
		HCl (mg/m ³)		0,1 / 0,5	none				14
	nitrogen	NO _x (mg/m ³)		0,5 / 1,0	none				14
		NH ₃ (mg/m ³)		1,0 / 3,0	none				14
	hydrogen fluoride	HF (mg/m ³)	0,01 / 0,03	none				14	
	ozone	O ₃ (mg/m ³)	0,05/ 0,1	none				14	
Mechanically active substances	dust (Sedimentation)	other than cabin (mg/(m ² h))	3,0	none				15	
		cabin only (mg/(m ² h))	1,0					15	
	sand	(mg/m ³)	0,1	none				15	
Flora and Fauna	micro organism		mould, fungus, etc.	none				16	
	rodents, insects		rodents, etc.	none				16	
Contaminating fluids	oil	motor	no						
		gearbox	no						
		hydraulic transformer		none				17	
	fluid	brake		Electrical engine compartment only	none				17
		cooling			none				17
	grease			none				17	
	battery electrolyte			none				17	
fuel			no						
no:	This condition does not occur in this class.								
none:	Verification is required only in special cases.								
NOTES:	Number of note, see clause 4.2.								
Key:	a) Ventilated compartment; b) Unventilated compartment; c) Engine compartment; d) Near refrigerated air conditioning; e) Outdoor air.								

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