



# SLOVENSKI STANDARD

## SIST ETS 300 019-2-5:1999

01-november-1999

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**Inženiring opreme (EE) - Pogoji okolja in preskusi vplivov okolja za telekomunikacijsko opremo – Del 2-5: Specifikacija preskusov vplivov okolja - Inštalacije v kopenskih vozilih**

Equipment 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: ETS 300 019-2-5 Edition 1**

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**ICS:**

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

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**E**UROPEAN  
**T**ELECOMMUNICATION  
**S**TANDARD

**ETS 300 019-2-5**

May 1994

Source: ETSI TC-EE

Reference: DE/EE-1019-2-5

ICS: 33.080

**Key words:** Environment, specification, equipment

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

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## Foreword

This multi-part European Telecommunication Standard (ETS) has been produced by the Equipment Engineering (EE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETS 300 019 is concerned with environmental conditions and environmental tests for telecommunications equipment and comprises two main parts, each with subdivisions:

- ETS 300 019-1: "Classification of environmental conditions".

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

- ETS 300 019-2: "Specification of environmental tests".

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. This part, (Part 2-5), deals with ground vehicle installations.

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## 1 Scope

This European Telecommunication Standard (ETS) specifies test methods and severities for the verification of the required resistibility of equipment according to the relevant environmental class.

The tests in Part 2-5 of this multi-part standard 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 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] 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 68-2: "Basic environmental testing procedures. Part 2: Tests".
- [3] 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 this ETS.

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 utilisation of the equipment under test. The heat dissipation shall be maximised, except for the steady state, low temperature test, where it shall be minimised.

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 T 5.1: Vehicle, protected installation.				
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	
Air temperature	low	(°C)	-25	-25 (11)	16 h	IEC 68-2-1	Ab/Ad: Cold (10)	
		(°C)	+40	a),e) +40 (1) or +55	16 h	IEC 68-2-2	Bb/Bd: Dry heat	
	high	(°C)	+70	b),c) +70 or +85 (2)	16h	IEC 68-2-2	Bb/Bd: Dry heat	
		rapid	(°C)	-25/+30	(3)			
	change	gradual	(°C) (°C/min)	-25/+30 5 not c)	-25/+30	5 cycles t <sub>1</sub> = 3 h	IEC 68-2-14	Na: Change of temperature
			(°C) (°C/min)	-25/+60 10 c)	-25/+30	5 cycles t <sub>1</sub> = 3 h	IEC 68-2-14	Na: Change of temperature
Temperature	change	air/water	(°C)	no not c)				
		air/water	(°C)	+60/+5 c)	(16)			
		air/snow	(°C)	+60/-5 c)	(16)			
Humidity	relative	slow temperature change	(%) (°C)	95 +40	93 +40	4 d	IEC 68-2-56	Cb: Damp heat steady state
		rapid temperature change	(%) (°C)	95 -25/+30 not d)	90-100 +40	2 cycles	IEC 68-2-30	Db: Damp heat, cyclic, Variant 2 (19)
			(%) (°C)	95 +10/+70 d)	90-100 +55	2 cycles	IEC 68-2-30	Db: Damp heat, cyclic, Variant 2 (19)
	low	(%) (°C)	10 +30	(16)				
	absolute	rapid temperature change	(g/m <sup>3</sup> ) (°C)	60 +70/+15	(17)			
Air	pressure	low	(kPa)	70	none			
	speed		(m/s)	20	none			

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**Table 1 (continued): Test specification T 5.1: Protected installation - climatic tests**

Environmental parameter			Environmental Class 5.1	Environmental test specification T 5.1: Vehicle, protected installation.				
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	
Water	rain	intensity	no					
	other sources	velocity (m/s)	0,3	none				
	wetness		wet surfaces	(4)				
Radiation	solar	(W/m <sup>2</sup> )	700	(22)				
	heat	(W/m <sup>2</sup> )	600	(5)				
Chemically active substances	sulphur	SO <sub>2</sub> (mg/m <sup>3</sup> )	0,3/1,0 (6)	none (9)				
		H <sub>2</sub> S (mg/m <sup>3</sup> )	0,1/0,5 (6)	none (9)				
	chlorine	sea salts		salt mist	none (9)			
		road salts		solid salt, salt water	none (9)			
		HCl (mg/m <sup>3</sup> )	0,1/0,5 (6)	none (9)				
	nitrogen	NO <sub>x</sub> (mg/m <sup>3</sup> )	0,5/1,0 (6)	none (9)				
		NH <sub>3</sub> (mg/m <sup>3</sup> )	1,0/3,0 (6)	none (9)				
	hydrogen fluoride HF	(mg/m <sup>3</sup> )	0,01/0,03 (6)	none (9)				
ozone O <sub>3</sub>	(mg/m <sup>3</sup> )	0,05/0,1 (6)	none (9)					
Mechanically active substances	dust	sedimentation (mg/(m <sup>2</sup> h))	3,0 (16) 1,0 (7)	(16) (16)				
	sand	(mg/m <sup>3</sup> )	0,1 no (7)	(16)				

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