



**SLOVENSKI STANDARD**  
**SIST ETS 300 019-2-2:1999**

**01-november-1999**

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**Inženiring opreme (EE) - Pogoji okolja in preskusi vplivov okolja za telekomunikacijsko opremo – Del 2-2: Specifikacija preskusov vplivov okolja - Prevoz**

Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-2: Specification of environmental tests; Transportation

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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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Transportation**

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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 2-2), deals with transportation.

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## 1 Scope

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

The tests defined in Part 2-2 of this multi-part standard apply to transportation of equipment covering the environmental conditions stated in ETS 300 019-1-2 [1].

## 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 European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 019-1-2: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment Part 1-2: Classification of environmental conditions Transportation".
- [2] IEC 68-2: "Environmental testing: Part 2 : Tests".
- [3] ISO 4180-2 (1980): "Complete, filled transport packages - General rules for the compilation of performance test schedules - Part 2: Quantitative data".
- [4] 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 300 019-1-2 [1].

ETS 300 019-2-0 [4] forms a general overview of Part 2 of this ETS.

If the equipment is normally transported in a packed state then it shall be tested in its packaging.

### 3.1 Specification T 2.1: Very careful transportation

This specification applies to transportation by air and by road on good quality road surfaces where special care has been taken with respect to low temperatures, handling and type of vehicle. See tables 1 and 2.

**Table 1: Test specification T 2.1: Very careful transportation - climatic tests**

Environmental parameter			Environmental Class 2.1	Environmental test specification T 2.1: Very careful transportation				
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	
Air temperature	low	(°C)	-25	-25	6 h	IEC 68-2-1	Ab: Cold	
	high	unventilated	(°C)	+70	+70	6 h	IEC 68-2-2	Bb: Dry heat
		ventilated or outdoors	(°C)	+40	none			
	change	air/air	(°C) (°C/min)	-25/+30	-25/+30 1	5 cycles t1 = 3 h	IEC 68-2-14	Nb: Change of temperature (4)
		air/water	(°C)	+40/+5	none			
Humidity	relative	slow temperature change	(%) (°C)	95 +40	93 +30	4 d	IEC 68-2-56	Cb: Damp heat steady state (9)
		rapid temperature change	(%) (°C)	95 -25/+30	90-100 +40	2 cycles	IEC 68-2-30	Db: Damp heat cyclic Variant 1
	absolute	rapid temperature change	(°C) (g/m <sup>3</sup> )	+70/+15 60	none (6) (3)			
Air	pressure	low	(kPa)	70	none			
		change		no				
	speed	(m/s)	20	none				
Water	rain	intensity	(mm/min)	6 (1)	none			
		low temperature	(°C)	no				
	other sources	(m/s)	1 (1)	(3)				
	wetness		wet surfaces	(3)				
Radiation	solar	(W/m <sup>2</sup> )	1120	(7)				
	heat	(W/m <sup>2</sup> )	600	(7)				

(continued)

**Table 1 (concluded): Very careful transportation - climatic tests**

Environmental parameter			Environmental Class 2.1	Environmental test specification T 2.1: Very careful transportation.			
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method
Chemically active substances	sulphur	SO <sub>2</sub> (mg/m <sup>3</sup> )	1,0 (2)	none (5)			
		H <sub>2</sub> S (mg/m <sup>3</sup> )	0,5 (2)	none (5)			
	chlorine	salts	sea and road salt mist	none (5)			
		Cl <sub>2</sub> (mg/m <sup>3</sup> )	no				
		HCl (mg/m <sup>3</sup> )	0,5 (2)	none (5)			
	nitrogen	NO <sub>x</sub> (mg/m <sup>3</sup> )	1,0 (2)	none (5)			
		NH <sub>3</sub> (mg/m <sup>3</sup> )	3,0 (2)	none (5)			
	hydrogen fluoride HF	(mg/m <sup>3</sup> )	0,03 (2)	none (5)			
ozone O <sub>3</sub>	(mg/m <sup>3</sup> )	0,1 (2)	none (5)				
Mechanically active substances	dust	sedimentation (mg/(m <sup>2</sup> h))	3,0	none (8)			
		suspension (mg/m <sup>3</sup> )	no				
	sand	(mg/m <sup>3</sup> )	100	none (8)			
Flora and Fauna	micro organisms		mould, fungus, etc.	none (5)			
	rodents, insects		rodents, etc.	none (5)			
no = this condition does not occur in this class. none = verification is required only in special cases.			(n) = NOTE (n = number of note), see subclause 3.4.				

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