

SLOVENSKI STANDARD SIST EN 300 019-2-3 V2.4.1:2016

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Okoljski inženiring (EE) - Okoljski pogoji in preskusi vplivov okolja na telekomunikacijsko opremo - 2-3. del: Specifikacija preskusov vplivov okolja -Stacionarna uporaba na lokacijah, zaščitenih pred vremenskimi vplivi

Environmental Engineering (EE) - Environmental conditions and environmental tests for telecommunications equipment - Part 2-3: Specification of environmental tests - Stationary use at weatherprotected locations

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ICS:

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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en

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Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-3: Specification of environmental tests; Stationary use at weatherprotected locations 2

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650 Route des Lucioles F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C Association à but non lucratif enregistrée à la ITeh Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

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

The present document is part 2, sub-part 3 of a multi-part deliverable. Full details of the entire series can be found in part 2, sub-part 0 [3].

National transposition dates	
Date of adoption of this EN:	21 December 2015
Date of latest announcement of this EN (doa): Date of latest publication of new National Standard DARD PREV or endorsement of this EN (dop/e):	31 March 2016 IEW 30 September 2016
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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).

"must" and "must not" are NOT allowed in ETSI deliverables except when used in direct citation.

1 Scope

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

The tests in the present document apply to stationary use of equipment at weatherprotected locations covering the environmental conditions stated in ETSI EN 300 019-1-3 [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 reference document (including any amendments) applies.

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

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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

[1]	ETSI EN 300 019-1-3: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3: Classification of environmental conditions; Stationary use at weatherprotected locations".
[2]	IEC 60068-2-1 (03-2007): "Environmental testing - Part 2-1: Tests - Test A: Cold".
[3]	ETSI EN 300 019-2-0 <u>Sl'Environmental Engineering ((EE);</u> Environmental conditions and environmental tests fon telecommunications equipment; Part 2+0) Specification of environmental tests; Introduction 49723fa2a/sist-en-300-019-2-3-v2-4-1-2016
[4]	IEC 60721-3-3: "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weatherprotected locations".
[5]	Void.
[6]	IEC 60068-2-2 (07-2007): "Environmental testing - Part 2-2: Tests - Test B: Dry heat".
[7]	IEC 60068-2-14 (01-2009): "Environmental testing - Part 2-14: Tests - Test N: Change of temperature".
[8]	IEC 60068-2-78 (10-2012): "Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state".
[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".

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

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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.

Not applicable.

3 Environmental test specifications

The detailed descriptions of the environmental conditions are in clauses 4 and 5 of ETSI EN 300 019-1-3 [1].

ETSI EN 300 019-2-0 [3] forms a general overview of part 2 of this multi-part deliverable.

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. **Teh STANDARD PREVIEW**

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Specifications T 3.1 and T 3.1E: Temperature-controlled locations 3.1

Specification T 3.1: Temperature-controlled locations - normal operating conditions.

The specification in table 1 and table 2 shall apply to permanently temperature-controlled enclosed locations where humidity is usually not controlled.

Table 1: Test specification T 3.1: Temperature-cor	ntrolled locations - climatic tests

I	Environment	al parameter			vironmental Class 3.1	Temperature-controlled locations					
Туре	Parameter	Detail par	ameter	Cha		Test severity			Method	Notes	
	Low		(°C)		+5	+5	16 h	IEC 60068-2-1 [2]	Ab/Ad/Ae: Cold	1	
	High		(°C)		+40	+40 or +50			Bb/Bd/Be: Dry heat	2	
Air temperature	Change		(°C) (°C/min)		0,5	+25/+40		IEC 60068-2-14 [7]		3	
		low	(%)		5	none				4	
	Relative	high	(%) (°C)		85	85 +30	4 d	IEC 60068-2-78 [8]	Cab: Damp heat steady state	5	
Humidity Abso		condensation			no						
		low 🛒	(g/m ²)		1	none				4	
	Absolute	high S:	(g/m ²)		25					7	
	_	low St	(kPa)	F	70	none				8	
Air	Pressure	high	(kPa)	P	106	none				8	
	Speed	farci 6a	(m/s)	Þ	5,0	none				4	
		intensity 🚼 🏭			no						
	Каш	low temperature		Ţ	no						
Vater	Other sources	atte	STE		no						
	Icing & frosting	ılog/st ′sist-e	10 2	Ð	no						
	Solar	and n-3	(W/m ²)		700					10	
Radiation	Heat	lard	(W/m ²)		600					11	
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Envir	onmental parameter			Environmental Class 3.1	Envi		est specificat		-use,
Туре	Parameter	Detail pa	arameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes
		SO ₂	(mg/m ³)	0,3/1,0	none				12
	Sulphur	H ₂ S	(mg/m ³)	0,1/0,5	none				12
		salt mist		sea and road salt	none				12
	Chlorine	CI	(mg/m ³)	0,1/0,3	none				12
Chemically active substances		HCI	(mg/m ³)	0,1/0,5	none				12
		NO _x	(mg/m ³)	0,5/1,0	none				12
	Nitrogen	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
		sedimentatio		1,5	none				12
Mechanically active substances	Dust		(mg/(m ² h)) (mg/m ³)	0,2	none				13
	Sand	suspension	(mg/m ²) (mg/m ³)	30	none				13
	Micro organisms		(ing/in)	negligible					
Flora and fauna	Rodents, insects			negligible					
class characteristic s achieved. NOTE 2: (Air temperature, hig The equipment unde specification). If two equipment is ventilat up test is performed,	Id start up test is perfor severity range) by the p (h). It test shall remain oper test temperatures are g red (natural or forced); the characteristic seven st specification. In this c	rational throu given, the low The higher te erity should b	ication. In the ghout this te ver test temperate st temperate used as a	his case, the cold s est (without any da berature applies if t ure includes the he high start up temp	tart up test sha mage or deterio the equipment is eating effects of perature, but it n	Il commence pration of pe s protected a solar and/o nay be modil	e once low tem rformance, acc against solar a r heat radiatior fied (within the	perature stat cording to pro nd heat radia n. If a high te class charao	bility is oduct ation or the mperature start cteristic severity
NOTE 3: (Air temperature, cha The change of temp 0,5 °C/min, the cooli	ange).	used to chec	k design tol	erance. IEC 60068	3-2-14 [7] Test I	νb shall be ι	Ised. For chan	ge of temper	
NOTE 4: (Relative humidity, lo There is no IEC 600	ow). 68-2 series test method	for this pare	meter.						
NOTE 5: (Humidity, relative, h				er than climatogra	m limits for this	class			
NOTE 6: (Condensation).	Fest Db shall be used w		_	-					
NOTE 7: (Humidity, absolute,			Ū.	C C					
NOTE 8: (Air pressure, low an			-	-	-				

t

Envir	onmental parameter		Environmental Class 3.1	Envi		test specification in the second s		
Туре	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes
NOTE 9: (Water, rain).			_					
		e equipment in the weath	erprotected or part	ly weatherprote	cted locatior	ns is included i	n IEC 60068	3-2-30 [9] Test
Db. No test is recom	mended.							
NOTE 10: (Radiation, solar).								
The higher test temp components and ma		n note 2 includes the hea	ting effect of solar	radiation. Photo	ochemical te	sts can be ma	de separate	ly for
NOTE 11: (Radiation, heat).								
The higher test temp	erature as described i	n note 2 includes the hea	iting effect.					
NOTE 12: (Chemically active s	ubstances).							
		nean/maximum values. T			red when de	esigning the ec	uipment an	d when
		st is recommended in the	e present documer	nt.				
NOTE 13: (Mechanically active								
		er than lowest test severite equipment and when cho			nd therefore	no test is reco	mmended.	This condition

Table 2: Test specification T 3.1: Temperature-controlled locations - mechanical tests

	Environmenta	al parameter	Environmental Class 3.1	E		est specification T 3.1: ure-controlled location	,	
Туре	Parameter	Detail	Characteristic	Test severity	Duration	Reference	Method	Notes
		paramete	severity					
Vibration	Sinusoidal	displacement (mm) acceleration (m/s ²) frequency range (Hz) axes of vibration	0,3 2-9 1 STA 9-200	none				1
Shocks	Shocks	shock spectrum and shock spectrum acceleration (m/s ²) number of shocks direction of shocks	Type L 22 40	half sine 11 30 6	3 in each direction	IEC 60068-2-27 [11]	Ea: Shock	2
	(Shocks).	oidal). mended as the characteri st severity are not specifi		Ū		Ũ	•	

shock given as test sevenity have been considered more appropriate than that given by the characteristic severity. Equipment under test shall be mounted in the "in use" position. The equipment function shall be monitored throughout the test. ea48-4208-9ba4-2016

Specification T 3.1E: Temperature-controlled locations - exceptional operating conditions.

The specification in table 3 shall apply to permanently temperature-controlled locations where humidity is usually not controlled. The reference class is the same as for T 3.1, but the test specification relates to reduced performance requirements.

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	Environmental	paramete	r	Environmental Condition 3.1E			tal test specification		
Туре	Parameter	Detail p	parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes
	Low		(°C)	-5	-5	16 h	IEC 60068-2-1 [2]	Ab/Ad/Ae: Cold	1
Air	High		(°C)	+45	+45 or +55	16 h	IEC 60068-2-2 [6]	Bb/Bd/Be: Dry heat	2
emperature			(°C)		+25/+45	half cycle	IEC 60068-2-14 [7]	Nb: Change of	3
	0		(°C/́min)	0,5	0,5	t ₁ = 3 h		temperature	
		low	(%)	5	none				4
	Relative	high	(%) (°C)	90	93 +30	4 d	IEC 60068-2-78 [8]	Cab: Damp heat steady state	5
Humidity		condensa	tion	no					
		low	(g/m ³)	1	none				4
	Absolute	high	(g/m ³)	25					6
	Solar		(W/m ²)	700					7
Radiation	Heat		(W/m ²)	600					8
ac NOTE 2: (A	chieved. ir temperature,	, high).	//stanc	Te				ature, but it may be mo e once low temperatur	Ĩ
ac NOTE 2: (A Th sp eq sta ch	chieved. ir temperature, ne equipment u pecification). If t quipment is ver art up test is pen naracteristic sev	, high). under test s two test ter ntilated (nat erformed, th verity range	hall remain of nperatures ar ural or forced	perational throughou e given, the lower te). The higher test ter stic severity should b	t this test (without st temperature app nperature includes e used as a high s	any damage or blies if the equip the heating effort tart up temperat	deterioration of perfor ment is protected aga ects of solar and/or he ure, but it may be mod		roduct iation or tl emperatur
ac NOTE 2: (A Th sp eq sta ch sta NOTE 3: (A Th	chieved. ir temperature, ne equipment u pecification). If t quipment is ver art up test is pen- naracteristic sev- ability is achiev ir temperature, ne change of te	, high). under test s two test ter ntilated (nat erformed, th verity range ved. , change). emperature	hall remain of nperatures ar ural of forced he characters b) by the prod sist-og sorra	perational throughou e given, the lower test). The higher test ter stic severity should b uct specification. In t	t this test (without st temperature app nperature includes e used as a high s his case, the high sign tolerance. IEC	any damage or blies if the equip the heating effi- tart up temperat temperature sta	deterioration of perfor ment is protected aga ects of solar and/or he ure, but it may be mod irt up test shall comme Test Nb shall be used	e once low temperatur mance, according to p inst solar and heat rad at radiation. If a high t dified (within the class ence once high temper d. For change of tempe	roduct iation or th emperatur ature
ac NOTE 2: (A Th sp eq sta ch sta NOTE 3: (A Th 0,9 NOTE 4: (R Th	chieved. ir temperature, ne equipment u pecification). If t quipment is ver art up test is pen- naracteristic sev- ability is achiev ir temperature, ne change of te 5 °C/min, the c telative humiditor nere is no IEC 0	, high). under test s two test ter ntilated (nat erformed, th verity range ved. , change). emperature cooling grac ty, low). 60068-2 se	hall remain of nperatures ar ural of forced he characters b) by the prod sist-or nave test is normal lient may be	perational throughou e given, the lower test). The higher test ter stic severity should b uct specification. In t	t this test (without st temperature app nperature includes e used as a high s his case, the high sign tolerance. IEC n where test cham	any damage or blies if the equip the heating effi- tart up temperat temperature sta	deterioration of perfor ment is protected aga ects of solar and/or he ure, but it may be mod irt up test shall comme	e once low temperatur mance, according to p inst solar and heat rad at radiation. If a high t dified (within the class ence once high temper d. For change of tempe	roduct iation or th emperatur ature
ac NOTE 2: (A Th sp eq sta ch sta NOTE 3: (A Th 0,9 NOTE 4: (R Th NOTE 5: (H	chieved. ir temperature, ne equipment u pecification). If t quipment is ver art up test is pen- aracteristic sev- ability is achiev ir temperature, ne change of te 5 °C/min, the c telative humidita- nere is no IEC of lumidity, relativo C 60068-2-78	, high). under test s two test ter htilated (nat erformed, th verity range ved. , change). emperature cooling grac ty, low). 60068-2 se ve, high). [8] Test Ca	hall remain of nperatures ar ural of forced he characters b) by the prod test is non- dient may be test is non- dient may be ries test still	perational throughou e given, the lower test b. The higher test ter stic severity should b uct specification. In t lly used to check des reduced to 0,2 °C/min	t this test (without st temperature app nperature includes e used as a high s his case, the high sign tolerance. IEC n where test cham r.	any damage or blies if the equip to the heating effect tart up temperat temperature sta 60068-2-14 [7] ber restrictions	deterioration of perfor ment is protected aga ects of solar and/or he ure, but it may be mod irt up test shall comme Test Nb shall be used preclude a gradient of	e once low temperatur mance, according to p inst solar and heat rad at radiation. If a high t dified (within the class ence once high temper d. For change of tempe	roduct iation or th emperatur ature
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