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Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-6: Specification of environmental tests; Ship environments

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European Standard (Telecommunications series)

**Environmental Engineering (EE);
Environmental conditions and environmental tests
for telecommunications equipment;
Part 2-6: Specification of environmental tests;
Ship environments**

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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 6 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 ship environments.

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 severities and methods for the verification of the required resistibility of equipment according to the relevant environmental class.

The tests defined in the present document apply to the use of telecommunication equipment installed permanently or temporarily in ships and cover the environments and the vessels stated in EN 300 019-1-6 [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 300 019-1-6: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-6: Classification of environmental conditions; Ship environments"
- [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"

3 Environmental test specifications

The detailed descriptions of the environmental conditions are given in clauses 4 and 5 of EN 300 019-1-6 [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 6.1: Totally weatherprotected locations

This specification applies to a totally weatherprotected use in ships excluding Warm Damp and Warm Damp Equable climates, see tables 1 and 4.

Table 1: Test specification T 6.1: Totally weatherprotected locations - climatic tests

Environmental parameter			Environmental Class 6.1	Environmental test specification T6.1: Ship, totally weatherprotected locations				
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	16 h	IEC 60068-2-2 [2]	Bb/Bd: Dry heat	2
	change	air/water (°C)	no					
	surface	high (°C)	no					
Humidity	relative	low (%)	10	none				6
		high; slow temperature change (°C)	95	93	96 h	IEC 60068-2-56 [2]	Cb: Damp heat steady state	7
		high; rapid temperature change (°C)	no					
	absolute	high; (g/m ³)	no					
		rapid temperature change (°C)						
Air	speed	(m/s)	no					
Water	temperature	high (°C)	+30	none				6
		low (°C)	no					
	rain	intensity (mm/min)	no					
		volume (m ³ /min)						
	other sources	pressure (kPa)						
wetness	velocity (m/s)	no						
Radiation	solar	(W/m ²)	no					
	heat	(W/m ²)	no					
Chemically active substances	sulphur	SO ₂ (mg/m ³)	0,1	none				15
		H ₂ S (mg/m ³)	0,01	none				15
	chlorine	sea salts	negligible					
		HCl (mg/m ³)	0,1	none				15
	nitrogen	NO _x (mg/m ³)	0,1	none				15
		NH ₃ (mg/m ³)	0,3	none				15
	hydrogen fluoride	HF (mg/m ³)	0,003	none				15
ozone	O ₃ (mg/m ³)	0,01	none				15	

Environmental parameter			Environmental Class 6.1	Environmental test specification T6.1: Ship, totally weatherprotected locations				
Type	Parameter	Detail parameter	Characteristic severity	Test severity	Duration	Reference	Method	Notes
Mechanically active substances	dust	sedimentation	negligible					
	sand in air		no					
	soot deposit		no					
Flora and Fauna	micro organisms		negligible					
	rodents, insects		negligible					
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.								

3.2 Specification T 6.2: Partly weatherprotected locations

This specification applies to use in ships excluding Cold Climate and extreme weather conditions, see tables 2, 4 and 5.

Table 2: Test specification T 6.2: Partly weatherprotected locations - climatic tests

Environmental parameter			Environmental Class 6.2	Environmental test specification T6.2: Ship, partly weatherprotected locations					
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) +70	+70 or +85	16 h	IEC 60068-2-2 [2]	Bb/Bd: Dry heat	2	
	change	gradual	(°C) -25/+40 (°C/min) 3	-25/+40 3	5 cycles t ₁ = 3 h	IEC 60068-2-14 [2]	Nb: Change of temperature	3	
	change	air/water	(°C) +40/+5	none				4	
	surface	high	(°C) +70	none				5	
Humidity	relative	low	(%) 10	none				6	
		high;	(%) 95	93	96 h	IEC 60068-2-56 [2]	Cb: Damp heat steady state	7	
		slow temperature change	(°C) +45	+40					
		high;	(%) 95	none			8		
	rapid temperature change	(°C) -25/+35							
absolute	high;	(g/m ³) 60					9		
	rapid temperature change	(°C) +70/+15		90-100 +55	6 cycles	IEC 60068-2-30 [2]	Db: Damp heat cyclic, variant 2		
Air	speed		(m/s) 30	none				6	
Water	temperature	high	(°C) +35	none				6	
		low	(°C) freezing point	none				10	
	rain	intensity	(mm/min) 6					11	
		volume	(m ³ /min)		0,01	1 min/m ² or 5 min	IEC 60068-2-18 [2]	Rb: Impacting water method 1.2	
		pressure	(kPa)		90				
	other sources	velocity	(m/s) 3	none				12	
	wetness		wet surfaces	none				13	