



AMENDMENT

ETS 300 019-2-4

A1

June 1997

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**This amendment A1 modifies
the European Telecommunication Standard ETS 300 019-2-4 (1994)**

**Equipment Engineering (EE);
Environmental conditions and environmental tests for
telecommunications equipment;
Part 2-4: Specification of environmental tests
Stationary use at non-weatherprotected locations**

ETSI

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Foreword

This amendment to ETS 300 019-2-4 (1994) has been produced by the Equipment Engineering (EE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Transposition dates	
Date of adoption of this amendment:	20 June 1997
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Amendments

Contents

Add:

- 4 Earthquake test specification
 - 4.1 Vibration response investigation
 - 4.2 Test conditioning

Before Annex A

Add the following new clause:

4 Earthquake test specification

If earthquake conditions are specified by the customer, the earthquake test requirements stated below shall be applied.

The test specification is applicable to class 4.1.

4.1 Vibration response investigation

A preliminary vibration response investigation shall be carried out to determine the lowest resonant frequency of the mounted test specimen.

The vibration response investigation can be carried out by means of *sine sweep testing* or *random testing*.

When using the *sine sweep testing*, the vibration response investigation shall be carried out in a manner based on that of IEC Publication 68-2 [2] subpart 6 (test Fc), with the following parameter severities:

Frequency range: 1 - 35 Hz

Vibration amplitude: 2 m/s²

Sweep rate: ≤ 1 octave/min

NOTE: The vibration amplitude may be reduced to 1 m/s² or less in case of sharp resonances.

If a *random test* is used this shall be performed in accordance with the requirements of IEC Publication 68-2 [2] subpart 64, using the following severities:

Frequency range: 1 - 20 Hz 20 - 35 Hz

ASD: 0,5 m²/s³ - 3 dB/octave

Duration: 3 minutes

NOTE: The Acceleration Spectral Density (ASD) value may be reduced to 0,3 m²/s³ or less in case of sharp resonances.

The time-history stated in table 4 can be omitted if, after the vibration response investigation, the equipment does not exhibit any resonance below 5 Hz and has passed the sinusoidal vibration test reported in table 3 for class 4M5, this test being sufficient to prove compliance with the earthquake conditions given in part 1 subpart 4 of the present ETS.

4.2 Test conditioning

See table 4.

The extent to which the equipment under test has to function during tests or merely to survive conditions of test shall be stated in the product specification.

Table 4: Test specification T 4.1: Earthquake test

Environmental parameter			Environmental class 4.1	Environmental test specification T 4.1: Earthquake test			
Type	Parameter	Detail parameter	Characteristic severity	Severity	Duration	Reference	Method
Earthquake	Time-history	RRS (1)	fig. 1 tab. 5	fig. 1 tab. 5		IEC 68-2-57	time-history
		frequency range	1-35 Hz	1-35 Hz			
		ZPA (2)	5 m/s ²	5 m/s ²			
		axes		3 axes (3)(4)(5)	30 s (6)(7)(8)		
	damping ratio			2 %			
<p>References to notes are shown above in parentheses.</p> <p>NOTE 1: Required Response Spectrum.</p> <p>NOTE 2: Zero Period Acceleration.</p> <p>NOTE 3: The equipment under test mounted in the "in use" position. The testing configuration shall be worst case in terms of weight and stiffness. The influence of connections, piping, cables, etc. shall be taken into account when mounting the specimen. The normal "in service" mounting structure of the specimen should be included in the test.</p> <p>NOTE 4: Single-axis excitation is recommended; simultaneous multi-axis excitation is also acceptable, but it is not recommended since, in general, multi-axis testing gives less reproducible test results.</p> <p>NOTE 5: The three testing axes can be reduced to two horizontal axes if the equipment, after the vibration response investigation in the vertical axis, does not exhibit any resonance below 20 Hz.</p> <p>NOTE 6: The strong part of the time-history should be at least 15 s.</p> <p>NOTE 7: This value is the duration of each time-history signal.</p> <p>NOTE 8: 1 time-history shall be applied along each axis.</p>							

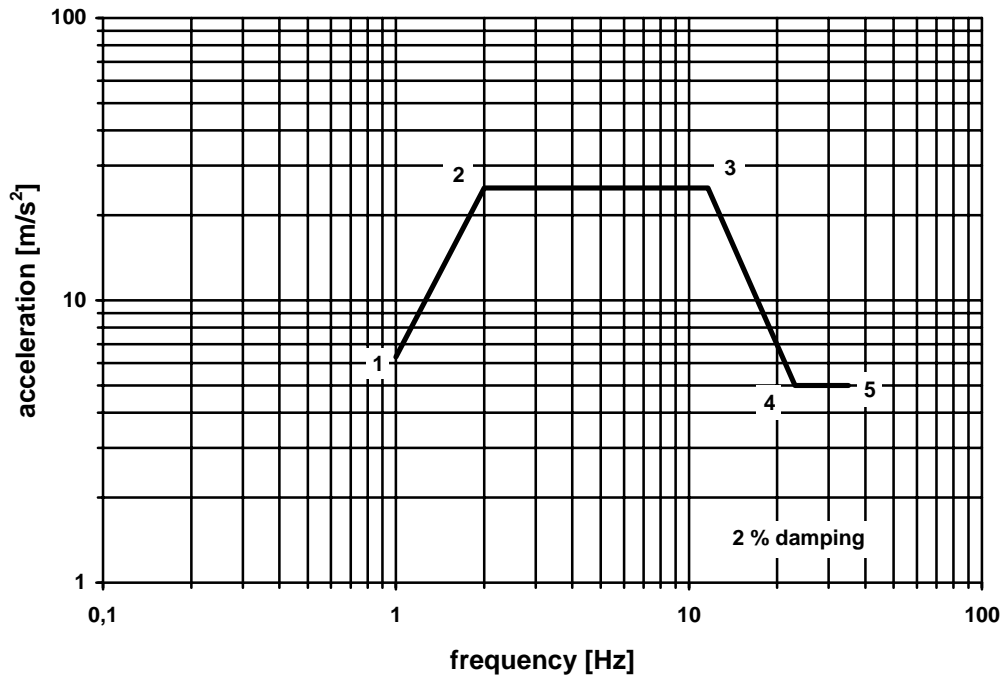


Figure 1: Earthquake Required Response Spectrum

Table 5: Acceleration co-ordinates for the Required Response Spectrum

Co-ordinate point	Frequency [Hz]	Ground acceleration [m/s ²]
1	1,0	6,3
2	2,0	25
3	11,6	25
4	23,0	5
5	35,0	5

History

Document history	
May 1994	First Edition
February 1997	One-step Approval Procedure OAP 9724: 1997-02-14 to 1997-06-13
June 1997	Amendment 1 to First Edition