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European Standard (Telecommunications series)

**Environmental Engineering (EE);
Environmental conditions and environmental tests
for telecommunications equipment;
Part 1-7: Classification of environmental conditions;
Portable and non-stationary use**

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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 1, sub-part 7 of a multi-part deliverable covering the classification of environmental conditions and environmental tests for telecommunications equipment, as identified below:

Part 1: "Classification of environmental conditions";

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 2: "Specification of environmental tests".

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 1-0 forms a general overview of part 1.

Part 2 specifies the recommended test severities and test methods for the different environmental classes.

National transposition dates	
Date of adoption of this EN:	19 April 2002
Date of latest announcement of this EN (doa):	31 July 2002
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2003
Date of withdrawal of any conflicting National Standard (dow):	31 January 2003

1 Scope

The present document defines classes of environmental conditions and their severities to which telecommunication equipment may be exposed. The severities specified are those which will have a low probability of being exceeded; generally less than 1 %.

The present document applies to equipment during portable and non-stationary use including periods of transfer, down time, maintenance and repair at locations defined in clauses 3 to 5.

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.

- [1] IEC 60721-3-7: "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 7: Portable and non-stationary use".
- [2] IEC 60721-2-1: "Classification of environmental conditions. Part 2: Environmental conditions appearing in nature. Temperature and humidity".
- [3] IEC 60068-2-27: "Environmental testing. Part 2: Tests. Test Ea and guidance: Shock".
- [4] ETSI EN 300 019-1-8: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-8: Classification of environmental conditions; Stationary use at underground locations".

3 Definitions

For the purposes of the present document, the following terms and definitions apply:

absolute humidity: mass of water vapour in grammes which is associated with one cubic metre of dry air in an air/water vapour mixture

non-weatherprotected location: location at which the equipment is not protected from direct weather influences

portable and non-stationary use: equipment which may be moved frequently from place to place

NOTE: The total transfer time may amount to a significant portion of the equipment's lifetime. The equipment is not permanently mounted on any structure or placed at a fixed site. The equipment may be operating while being either in a stationary or in a transfer state.

relative humidity: ratio of the partial pressure of the water vapour in moist air at a given temperature, to the partial pressure of the water vapour in saturated air at the same temperature

weatherprotected location: location at which the equipment is protected from direct weather influences

NOTE 1: Partly weatherprotected location (sheltered location): direct weather influences are not completely excluded.

NOTE 2: Totally weatherprotected location (enclosed location): direct weather influences are totally excluded.

4 Environmental classes

Two mechanical classes, 7M2 and 7M3, are used and cover all the environmental classes 7.1 to 7.3E.

The relevant class is determined by consideration of the expected handling, means of transfer and complete use-profile of the equipment.

The special, severe, class 7M3 applies to use only in circumstances where the equipment is exposed to rough handling, severe shocks and vibration e.g. from the means of transfer or rotating machinery.

The classes shown in parentheses, e.g. (7C1), may be selected for special applications.

4.1 Class 7.1: temperature controlled locations

This class is a combination of classes 7K1/7Z2/7ZA/7B1/7C2(7C1)/7S1/7M2 or 7M3 in IEC 60721-3-7 [1].

This class applies to use at, and direct transfer between, permanently temperature-controlled and enclosed locations. Humidity is usually not controlled. The climatogram is shown in figure 1.

Heating, cooling or humidification is used, where necessary, to maintain the required conditions, especially where there is a large difference between the internal climate and that open-air climate. Heating or cooling may be switched off for periods but the occurrence of extremely high or low temperatures is prevented.

This class applies to use at, and transfer between, locations:

- where the equipment may be exposed to solar radiation and to heat radiation. It may also be exposed to movements of the surrounding air (e.g. due to draughts in buildings through open windows) and to condensed water. It is not subjected to precipitation, or water from sources other than rain or icing;
- without particular risk of biological attack. This includes protective measures, e.g. special product design, or installation in locations of such construction that mould growth and attacks by animals, etc. are not probable;
- with normal levels of contaminants experienced in urban areas, with industrial activities scattered over the whole area and/or with heavy traffic;

NOTE: For long term exposure to simultaneous occurrence of several contaminants a special chemical class 7C1 should be chosen.

- without special precautions to minimize the presence of sand or dust, but which are not situated in proximity to sources of sand or dust.

The mechanical class shall be determined by reference to clause 4, "Environmental classes".

The conditions of this class may be found in, and during transfer to, normal working or living areas, e.g.:

- telecommunication centres;
- workshops;
- offices;
- storage rooms for valuable and sensitive products;
- shops;
- rooms for general use (theatres, restaurants, etc.);
- living rooms.

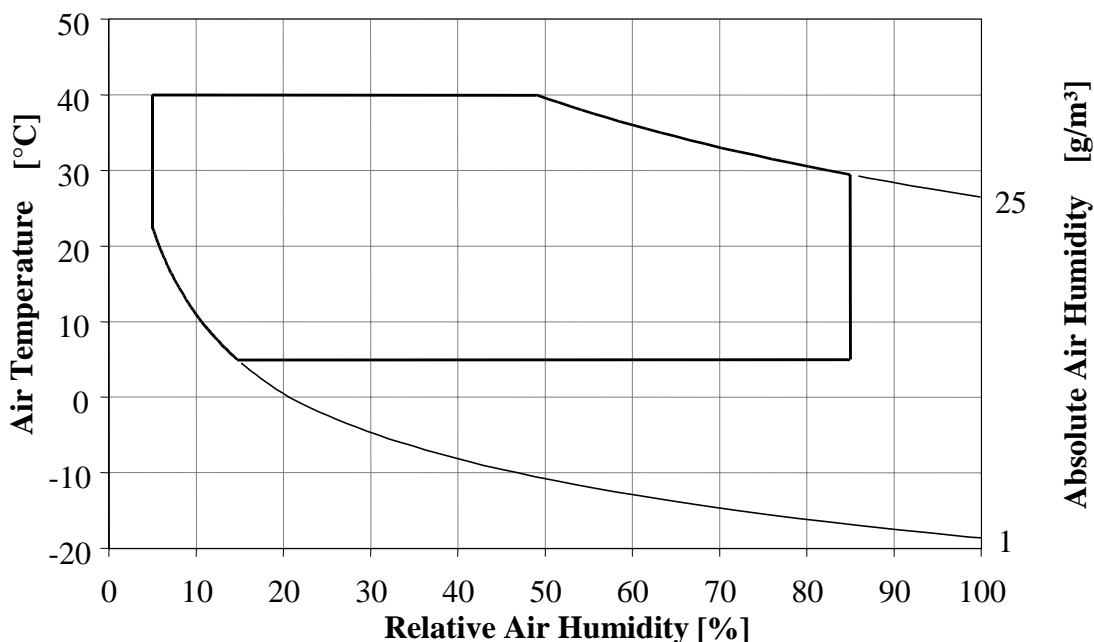


Figure 1: Climatogram for class 7.1: temperature controlled-locations

4.2 Class 7.2: partly temperature-controlled locations

This class is a combination of classes 7K2/7Z2/7ZA/7Z9/7B2/7C2(7C1)/7S2/7M2 or 7M3 in IEC 60721-3-7 [1].

This class applies to use at, and direct transfer between, enclosed locations having neither temperature nor humidity control. The climatogram is shown in figure 2.

Heating may be used to raise low temperatures, especially where there is a large difference between the conditions of this class and the open-air climate. Building construction is designed to avoid extremely high temperatures.

This class applies to use at, and direct transfer between, locations:

- where equipment may be exposed to solar radiation and heat radiation. It may also be exposed to movements of the surrounding air (e.g. due to draughts in buildings through open windows). It may be subjected to condensed water, to water from sources other than rain and to icing. It is not subjected to precipitation;
- where mould growth, or attacks by animals except termites, may occur;
- with normal levels of contaminants experienced in urban areas with industrial activities scattered over the whole area and/or with heavy traffic;

NOTE 1: For long term exposure to simultaneous occurrence of several contaminants a special chemical class 7C1 should be chosen.

- in close proximity to sources of sand or dust.

The mechanical class shall be determined by reference to clause 4, "Environmental classes".

The conditions of this class may be found in, and during transfer to:

- certain telecommunication buildings;
- unattended equipment stations;
- certain workshops;
- buildings in factories and industrial process plants;
- in garages;