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**Environmental Engineering (EE);  
Environmental conditions and environmental tests  
for telecommunications equipment;  
Part 1-1: Classification of environmental conditions;  
Storage**

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**ETSI**

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  
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 1, sub-part 1 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": (see note 1)**

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" (see note 2).

NOTE 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. Sub-part 1-0 forms a general overview of part 1.

NOTE 2: Specifies the recommended test severities and test methods for the different environmental classes.

### National transposition dates

|  |                 |
|--|-----------------|
| Date of adoption of this EN:   | 21 April 2014   |
| Date of latest announcement of this EN (doa):  | 31 July 2014    |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 January 2015 |
| Date of withdrawal of any conflicting National Standard (dow):                         | 31 January 2015 |

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# 1 Scope

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

NOTE 1: Temporary storage during transport is included in part 1-2: Transportation.

NOTE 2: If the equipment is stored in its package, the environmental conditions apply to the packaged equipment.

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# 2 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.

## 2.1 Normative references

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

Not applicable.

## 2.2 Informative references

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.

- [i.1] Void.
  - [i.2] IEC 60721-3-1:1997: "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 1: Storage".
  - [i.3] IEC 60068-2-27:2005: "Environmental testing. Part 2: Tests. Test Ea and guidance: Shock".
  - [i.4] IEC 60721-2-4:2002: "Classification of environmental conditions. Part 2: Environmental conditions appearing in nature: Solar radiation and temperature".
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# 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 equipment is not protected from direct weather influences

**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

**storage:** certain site where the equipment is placed for long periods but is not intended for use during these periods

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

NOTE 1: Totally weatherprotected location: Direct weather influences are totally excluded.

NOTE 2: Partly weatherprotected location: Direct weather influences are not completely excluded.

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## 4 Environmental classes

The classes shown in parentheses, e.g. (1C1), may be selected for special applications.

### 4.1 Class 1.1: Weatherprotected, partly temperature-controlled storage locations

This class is a combination of classes 1K3/1Z2/1B1/1C2(1C1)/1S2/1M2 in IEC 60721-3-1 [i.2].

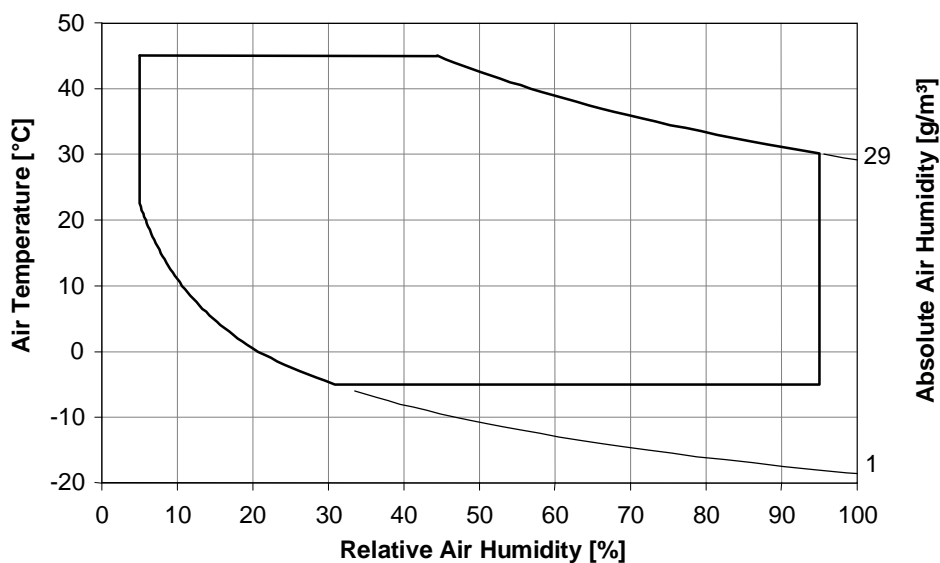
This class shall apply to weatherprotected partly temperature controlled storage. Humidity is usually not controlled. The climatogram is shown in figure 1.

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

This class shall apply to storage locations:

- where equipment may be exposed to solar radiation and heat radiation. It may also be exposed to movements of the surrounding air due to draughts in buildings, e.g. through open windows. It is not subjected to precipitation and water from sources other than rain;
- without particular risks by biological attacks. This includes protective measures, e.g. special package design, or storing at locations of such construction that mould growth, 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;
- without special precautions to minimize the presence of dust or sand, but not situated in proximity to dust or sand sources;
- with vibration of low significance and insignificant shock.

The conditions of this class may occur in ordinary storage rooms for frost-resistant products.



**Figure 1: Climatogram for class 1.1: weatherprotected, partly temperature-controlled storage locations**

## 4.2 Class 1.2: Weatherprotected, not temperature-controlled storage locations

This class is a combination of classes 1K4/1Z2/1Z3/1Z5/1B2/1C2(1C1)/1S3/1M2 in IEC 60721-3-1 [i.2].

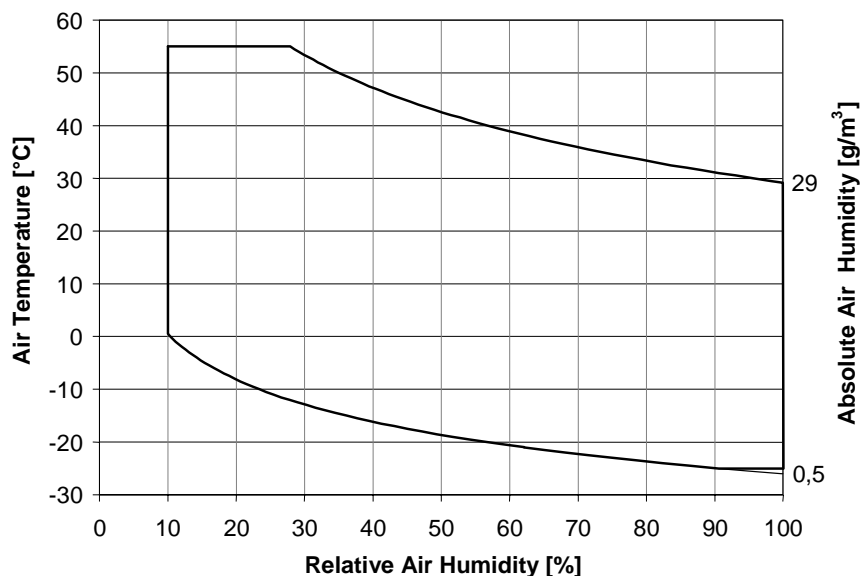
This class shall apply to weatherprotected storage having neither temperature nor humidity control. The location may have openings directly to the open air, i.e. it may be only partly weatherprotected. The climatogram is shown in figure 2.

This class shall apply to storage locations:

- where equipment may be exposed to solar radiation and temporarily to heat radiation. They may also be exposed to movements of the surrounding air due to draughts, e.g. through doors, windows or other openings. They may be subjected to condensed water, dripping water and to icing. They may also be subjected to limited wind-driven precipitation including snow;
- 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;
- in areas with sources of sand or dust, including urban areas;
- with vibration of low significance and insignificant shock.

The conditions of this class may occur in:

- unattended buildings;
- some entrances of buildings;
- some garages and shacks.



**Figure 2: Climatogram for class 1.2: weatherprotected, not temperature-controlled storage locations**

#### 4.3 Class 1.3: Non-weatherprotected storage locations; class 1.3E: non-weatherprotected storage locations-extended

Class 1.3 is a combination of classes 1K8/1Z1/1Z4/1B2/1C2/1S3/1M3(1M4) in IEC 60721-3-1 [i.2]. Class 1.3E is a combination of classes 1Z1/1Z4/1B2/1C2/1S3/1M3(1M4) in IEC 60721-3-1 [i.2] and the severities given in clause 5.1.

NOTE: If more severe mechanical conditions are expected, IEC class 1M4 may be chosen.

This class shall apply to storage which is not protected from direct weather influences. The climatogram is shown in figure 3.

This class shall apply to storage locations:

- which are directly exposed to an open-air climate including solar radiation, movement of the surrounding air, precipitation and water jets;
- where mould growth, or attacks by animals but excluding 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;
- in areas with sources of sand or dust, including urban areas;
- with significant vibration and shock, e.g. transmitted from machines or passing vehicles in the vicinity, etc.



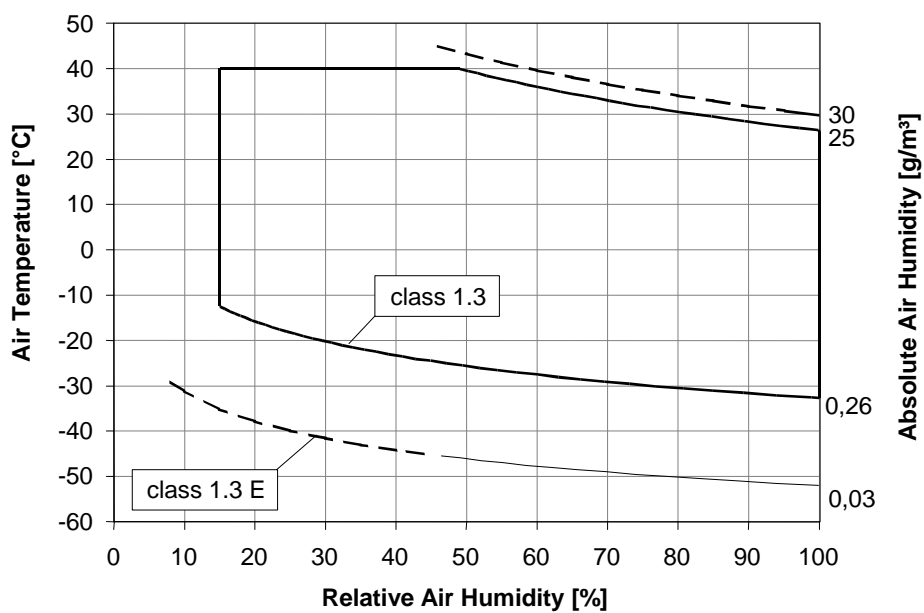


Figure 3: Climatogram for class 1.3 and 1.3E: non-weatherprotected storage locations

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