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European Standard (Telecommunications series)

**Environmental Engineering (EE);
Environmental conditions and environmental tests
for telecommunications equipment;
Part 1-6: Classification of environmental conditions;
Ship environments**

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Contents

Intellectual Property Rights	4
Foreword.....	4
1 Scope	5
2 References	5
3 Definitions	5
4 Environmental classes	6
4.1 Class 6.1: totally weatherprotected locations	6
4.2 Class 6.2: partly weatherprotected locations	6
4.3 Class 6.3: non-weatherprotected locations	7
5 Environmental conditions.....	8
5.1 Climatic conditions.....	8
5.2 Biological conditions.....	8
5.3 Chemically active substances	9
5.4 Mechanically active substances.....	9
5.5 Mechanical conditions.....	10
History	11

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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 6 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 latest announcement of this EN (doa):	31 July 2003
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2004
Date of withdrawal of any conflicting National Standard (dow):	31 January 2004

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 designed principally for maritime use. Conditions of use vary significantly in relation to the size of the vessel and the function for which it was designed. The reader should ensure that the relevant classes are chosen to suit this particular application.

The present document covers the following types of vessel:

- vessel propelled by mechanical means, including offshore units;
- vessel not propelled by mechanical means, including sailing boats and life rafts.

The classes defined apply to all sizes of vessel from pleasure craft to trawlers, ferry boats, icebreakers and cargo ships including tankers.

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>.

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|-----|---|
| [1] | ETSI ETR 035: "Equipment Engineering (EE); Environmental engineering Guidance and terminology". |
| [2] | IEC 60721-3-6: "Classification of environmental conditions. Part 3: Classification of groups of environmental parameters and their severities. Ship environment". |
| [3] | IEC 60721-2-1: "Classification of environmental conditions. Part 2: Environmental conditions appearing in nature. Temperature and humidity". |
| [4] | IEC 60068-2-27: "Environmental testing. Part 2: Tests. Test Ea and guidance: Shock". |
| [5] | IEC 60092-502: "Electrical installations in ships - Part 502: Tankers - Special features". |
| [6] | ISO 2041: "Vibration and shock - Vocabulary". |

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

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

weather-protected location:

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

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

4 Environmental classes

4.1 Class 6.1: totally weatherprotected locations

This class is a combination of classes 6K1/6B1/6C1/6S1/6M3 in IEC 60721-3-6 [2].

This class applies to equipment installed in totally weatherprotected, heated and ventilated locations following warm-up on board engine-powered vessels but excluding refrigerated cargo spaces, machinery spaces and locations containing equipment dissipating considerable amounts of heat. This class does not cover Warm Damp and Warm Damp Equable climates.

NOTE: Climatic conditions for different areas are defined in IEC 60721-2-1 [3].

This class applies to:

- equipment which is not exposed to heat radiation from adjacent equipment, heating elements or to solar radiation through glass or transparent materials;
- installations on board vessels operating in areas without particular risk of attack by flora or fauna. It also covers other vessels where the installations are located in compartments of such construction that mould growth and attacks by animals are unlikely;
- totally weatherprotected installations which are not subjected to salt mist, engine exhausts or emissions from nearby industrial sources;
- installations protected from sand, dust and ingress of soot;
- installations on board engine-powered vessels of all sizes.

4.2 Class 6.2: partly weatherprotected locations

This class is a combination of classes 6K4/6B2/6C3/6S2/6M3 or 6M4 in IEC 60721-3-6 [2].

This class applies, depending on the mechanical class chosen, to equipment installed in any location on board engine-powered vessels - excluding refrigerated cargo spaces. The class applies in all climates with the exception of Cold climates and areas with abnormal rain intensities and hurricanes. The equipment may occasionally be subjected to heavy seas. (See the note to clause 4.1).

This class applies to:

- equipment which is subjected to direct solar radiation, to considerable heat dissipation from boilers, engines etc., to rain and water jets. The equipment may be connected to wet surfaces;
- non-protected installations on board vessels operating in areas where mould growth and attacks by animals may occur;
- non-weatherprotected installations on board vessels operating close to industrial areas with considerable air pollution emissions. Salt mist and exposure to engine exhausts are included;
- all installations where sweeping of dusty decks may take place. It also covers locations subject to emissions from boiler exhausts (e.g. soot, acid, etc.). Non-weatherprotected installations on board vessels operating close to sand deserts are not covered;

- class 6M3: installations on board engine-powered vessels of all sizes but excluding equipment connected directly to reciprocating types of machinery. Equipment connected directly to loading systems, container guides, cranes and installations in dredgers are included;
- class 6M4: all installations on board engine-powered vessels of all sizes including equipment connected directly to reciprocating types of machinery.

NOTE: The proper mechanical IEC class 6M3 or 6M4 shall be chosen according to the expected installations and use of the equipment.

4.3 Class 6.3: non-weatherprotected locations

This class is a combination of classes 6K5/6B2/6C3/6S2/6M3 or 6M4 in IEC 60721-3-6 [2].

This class applies, depending on the mechanical class chosen, to equipment installed in any location on board engine-powered vessels, including refrigerated cargo spaces. This class applies in all climates including areas with abnormal rain intensities and hurricanes. The equipment may also be subjected to heavy seas. (See the note to clause 4.1.)

This class applies to:

- equipment which is subjected to direct solar radiation, to considerable heat dissipation from boilers, engines etc., to abnormal rain, heavy seas and water jets. The equipment may be connected to wet surfaces;
- non-weatherprotected installations on board vessels operating in areas where mould growth and attacks by animals may occur;
- non-weatherprotected installations on board vessels operating close to industrial areas with considerable air pollution emissions. Salt mist and exposure to engine exhausts are included;
- all installations where sweeping of dusty decks may take place. It also covers locations subject to emissions from boiler exhausts (e.g. soot, acid, etc.). Non-weatherprotected installations on board vessels operating close to sand deserts are not covered;
- class 6M3: installations on board engine-powered vessels of all sizes but excluding equipment connected directly to reciprocating types of machinery. Equipment connected directly to loading systems, container guides, cranes and installations in dredgers are included;
- class 6M4: all installations on board engine-powered vessels of all sizes including equipment connected directly to reciprocating types of machinery (see note in clause 4.2).