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CLASSIFICATION OF ENVIRONMENTAL CONDITIONS PART 2: ENVIRONMENTAL CONDITIONS APPEARING IN NATURE - AIR PRESSURE

Classification des conditions d'environnement
Deuxième partie: Conditions d'environnement présentes dans la nature - Pression atmosphérique

Klassifizierung von Umweltbedingungen
Teil 2: Natürliche Einflüsse - Luftdruck

BODY OF THE HD

The Harmonization Document consists of:

- IEC 721-2-3 (1987) ed 1; IEC/TC 75, not appended

This Harmonization Document was approved by CENELEC on 1989-12-05.

The English and French versions of this Harmonization Document are provided by the text of the IEC publication and the German version is the official translation of the IEC text.

According to the CENELEC Internal Regulations the CENELEC member National Committees are bound:

to announce the existence of this Harmonization Document at national level by or before 1990-03-01

to publish their new harmonized national standard by or before 1990-09-01

to withdraw all conflicting national standards by or before 1990-09-01.

Harmonized national standards are listed on the HD information sheet, which is available from the CENELEC National Committees or from the CENELEC Central Secretariat.

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NORME INTERNATIONALE

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Classification des conditions d'environnement

Deuxième partie:
Conditions d'environnement présentes dans la nature – Pression atmosphérique

Classification of environmental conditions

Part 2:
Environmental conditions appearing in nature – Air pressure

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CLASSIFICATION OF ENVIRONMENTAL CONDITIONS

Part 2: Environmental conditions appearing in nature

Air pressure

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by IEC Technical Committee No. 75: Classification of environmental conditions.

The text of this standard is based on the following documents:

Six Months Rule	Report on Voting
75(CO)33	75(CO)39

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

It should be noted that this standard forms one part of a series intended to deal with the following subjects:

- Classification of Environmental Parameters and their Severities (Publication 721-1).
- Environmental Conditions appearing in Nature (Publication 721-2).
- Classification of Groups of Environmental Parameters and their Severities. Introduction (Publication 721-3).

The following IEC publication is quoted in this standard:

Publication No. 721-1 (1981): Classification of Environmental Conditions, Part 1: Classification of Environmental Parameters and their Severities.

Other publication quoted:

ISO Standard 2533 (1975): Standard atmosphere.

CLASSIFICATION OF ENVIRONMENTAL CONDITIONS

Part 2: Environmental conditions appearing in nature

Air pressure

1. Scope

This part of the standard presents a selection of different values of air pressure appearing in nature. It is intended to be used as part of the background material when selecting appropriate severities of air pressure for product applications.

When selecting severities of the parameter air pressure for product applications, the values given in IEC Publication 721-1 should be applied.

2. Object

To indicate values of air pressure to which products are liable to be exposed during storage, transportation and use.

3. General

Air pressure can affect products in various ways, the most important of which are as follows:

3.1 *Air pressure lower than normal*

Low air pressure occurring at altitudes above sea-level can affect products as follows:

- leakage of gases or fluids from gasket-sealed containers,
- rupture of pressurized containers,
- change of physical and chemical properties of low density materials,
- erratic operation or malfunction of equipment from arcing or corona as the breakdown voltage between two electrodes in air decreases with pressure (the breakdown voltage of air in a uniform electric field depends on the product of the gas pressure and the electrode spacing for a given electrode shape and material (Paschen's law)),
- decreased efficiency of heat dissipation by convection and conduction in air, affecting equipment cooling (for the case of a box-shaped object dissipating heat to the surrounding air, having dimensions in the range of 100 mm to 200 mm and a surface emissivity coefficient of 0.7, a decrease of 30% in air pressure corresponding to an altitude of 3 000 m above sea-level has been found to cause an increase of 12% in temperature rise. Other shapes, especially finned structures, and other surfaces, especially polished metals, could show a considerably higher increase in temperature),

- acceleration of effects due essentially to temperature, for example volatilization of plasticizers, evaporation of lubricants, etc.

3.2 *Air pressure higher than normal*

High air pressure occurring in natural depressions and mines can have a mechanical effect on sealed containers.

4. Values of air pressure

The normal value of air pressure at mean sea-level is 101.325 kPa. Depending on meteorological conditions, air pressure at sea-level may vary from approximately 91% to 107% of the aforementioned value. Similar values of variation occur at altitudes above and below sea-level.

In areas above sea-level air pressure is lower than at sea-level, in areas below sea-level (natural depressions and mines) higher than at sea-level.

In the following Table I standard values of air pressure in round figures are given for different altitudes.

TABLE I

Normal air pressure related to altitudes above and below sea-level

Altitude (m)		Air pressure (kPa)
30 000		1.2
25 000		2.5
20 000		5.5
15 000		12.0
10 000		26.4
8 000		35.6
6 000		47.2
5 000		54.0
4 000		61.6
3 000		70.1
2 000		79.5
1 000		89.9
0	sea-level	101.3
- 400		106.2
- 1 000		113.9
- 2 000		127.8

Notes 1.- Values corresponding to the highest altitudes are given to take into account meteorological observation units and transportation by air.

2.- The altitude -400 m corresponds to the deepest natural depression in the world.

3.- For further information see ISO Standard 2533.