

Classification of environmental conditions —

**Part 2: Environmental conditions
appearing in nature —**

Section 2.5 Dust, sand, salt mist

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the General Electrotechnical Standards Policy Committee (GEL/-) to Technical Committee GEL/15, upon which the following bodies were represented:

- Directorate of Telecommunications
- EEA (the Association of Electronics, Telecommunications and Business Equipment Industries)
- Electronic Components Industry Federation
- Ministry of Defence
- National Supervising Inspectorate
- Society of Environmental Engineers
- Society of Motor Manufacturers and Traders Limited

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National foreword

This Section of BS 7527 has been prepared under the direction of the General Electrotechnical Standards Policy Committee. It is identical with IEC Publication 721-2-5:1991 “*Classification of environmental conditions — Part 2: Environmental conditions appearing in nature. Dust, sand, salt mist*”, published by the International Electrotechnical Commission (IEC). For the purposes of this British Standard, any references to IEC page numbers in the text should be ignored.

Other Parts of this British Standard are as follows.

- *Part 1: Environmental parameters and their severities;*
- *Part 2: Environmental conditions appearing in nature;*
- *Section 2.1: Temperature and humidity;*
- *Section 2.2: Precipitation and wind;*
- *Section 2.3: Air pressure;*
- *Section 2.4 :Solar radiation and temperature;*
- *Section 2.6: Earthquake vibration and shock;*
- *Section 2.7: Fauna and flora.*
- *Part 3: Classification of groups of environmental parameters and their severities;*
- *Section 3.0: Introduction;*
- *Section 3.1: Storage;*
- *Section 3.2: Transportation;*
- *Section 3.3: Stationary use at weatherprotected locations;*
- *Section 3.4: Stationary use at non-weatherprotected locations;*
- *Section 3.5: Ground vehicle installations;*
- *Section 3.6: Ship environment;*
- *Section 3.7: Portable and non-stationary use.*

Cross-references

International Standard	Corresponding British Standard
	BS 7527 <i>Classification of environmental conditions</i>
IEC 721-1:1990	Part 1:1991 <i>Environmental parameters and their severities</i> (Identical)
IEC 721-2-2:1988	Section 2.2:1991 <i>Precipitation and wind</i> (Identical)

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

This section of IEC 721-2 is intended to be used as part of the background information when selecting appropriate severities of parameters relating to dust, sand and salt mist for product application. The severities given in IEC 721-1 should be applied.

More detailed information on dust, sand and salt mist characteristics may be obtained from specialist documentation, some of which is given in the list of references in Annex B.

1 Scope

This section of IEC 721-2 presents characteristics of dust, sand and salt mist appearing in nature, and describes the influences from these environmental factors to which products are liable to be exposed during storage, transportation and use. Although the effect of these factors is often closely associated with and at times enhanced by wind, the environmental factor of wind is not dealt with in this section but in IEC 721-2-2.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this section of IEC 721-2. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this section of IEC 721-2 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 721-1:1990-12, *Classification of environmental conditions — Part 1: Environmental parameters and their severities*.

IEC 721-2-2:1988, *Classification of environmental conditions — Part 2: Environmental conditions appearing in nature — Section 2: Precipitation and wind*.

3 General

Dust, sand, salt mist and related wind can have an effect on products in various ways, the most important being:

- ingress of dust into enclosures and encapsulations;
- deterioration of electrical characteristics, e.g. faulty contact, change of contact resistance, change of track resistance;
- seizure or disturbance in motion of bearings, axles, shafts and other moving parts;
- surface abrasion (erosion, corrosion);
- clouding of optical surfaces;

- contamination of lubricants;
- reduction of thermal conductivity;
- clogging of ventilating openings, bushings, pipes, filters, apertures necessary for operation, etc.

The presence of dust and sand in combination with other environmental factors such as water vapour can have harmful effects on products, e.g. corrosion and mould growth. Damp heat atmospheres cause corrosion in connection with chemically aggressive dust, and similar effects are caused by salt mist contained in the air.

Effects of ion-conducting and corrosive dusts, e.g. de-icing salts, may have to be considered.

4 Natural dust and sand environments

4.1 Classification of dust and sand

The following definitions of dust and sand are based on different aerodynamic behaviour:

- dust may be defined as particulate matter of unspecified origin or composition and of size ranging from 1 µm to 150 µm. Particles of less than 75 µm diameter can remain suspended in the atmosphere for very long periods by natural turbulence of the air;
- sand is the term applied to segregated unconsolidated accumulation of detrital sediment, consisting essentially of rounded grains of quartz. The term is applied in sedimentary petrology to grains of size between 100 µm and 1 000 µm. Particles greater than 150 µm diameter are unable to remain airborne unless continually subjected to strong natural or induced air-flows or turbulence;
- smoke or fumes are dispersive systems in air consisting of particles below 1 µm.

4.2 Properties of dust and sand environments

4.2.1 Types of dust and sand

The main constituent of many dusts and sands occurring in nature is quartz, causing damaging effects experienced by products in deserts and similar dusty regions. The salient feature of quartz is its hardness, a property which can result in rapid wear or damage to products, particularly moving parts. However, erosion of material requires that the dust and sand are combined with a high velocity air stream or an extensive period of time.

Other important characteristics of this type of dust are that it is non-absorbent and chemically inert while other types present in combination with moisture or gases in the atmosphere may have corrosive effects on metals.