

Packaging code —

Section 19: Use of desiccants in packaging

UDC 621.798.02:66.047.8

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- British Plastics Federation
- Chemical Industries Association
- Export Packing Service Ltd.
- Institute of Packaging
- Ministry of Defence
- Timber Packaging and Pallet Confederation
- Coopted member

This British Standard, having been prepared under the direction of the Packaging and Freight Containers Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 December 1986

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First published December 1953
First revision July 1968
Second revision December 1986

The following BSI references relate to the work on this standard:
Committee reference PKM/584
Draft for comment 84/41479 DC

ISBN 0 580 15454 8

Amendments issued since publication

Amd. No.	Date of issue	Comments

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Foreword

This Section of BS 1133 was first issued in 1953, revised in 1968 and has now been revised to take into account current recommendations on desiccant quantities. This edition of the code supersedes BS 1133-19:1968, which is withdrawn.

A list of the current Sections of the packaging code is given below and the importance of preventing access of moisture to the content of the packages is stressed in these. One of the methods of minimising the effect of moisture is the use of the desiccants in conjunction with materials of very low water vapour permeability and this Section has been prepared to give guidance on this subject.

The packaging code consists of the following Sections all of which are published separately with the exception of Sections 1 to 3 which are published in one volume.

- *Sections 1 to 3: Introduction to packaging;*
- *Section 4: Mechanical aids in package handling;*
- *Section 5: Protection against spoilage of packages and their contents from attack by micro-organisms, insects, mites and rodents;*
- *Section 6: Temporary protection of metal surfaces against corrosion (during transport and storage);*
- *Section 7: Paper and board wrappers, bags and containers;*
- *Section 7-7.1: Wrapping papers;*
- *Section 7-7.2: Bags and envelopes;*
- *Section 7-7.3: Cartons and boxes;*
- *Section 7-7.5: Fibreboard cases;*
- *Section 8: Wooden containers;*
- *Section 9: Textile bags, sacks and wrappings;*
- *Section 10: Metal containers;*
- *Section 11: Packaging felt;*
- *Section 12: Cushioning materials (excluding packaging felt);*
- *Section 13: Twines and cords for packaging;*
- *Section 14: Adhesive closing and sealing tapes;*
- *Section 15: Tensional strapping;*
- *Section 16: Adhesives for packaging;*
- *Section 17: Wicker and veneer baskets;*
- *Section 18: Glass containers and closures;*
- *Section 18-1: Terminology;*
- *Section 21: Regenerated cellulose film, plastics film, aluminium foil and flexible laminates;*
- *Section 22: Packaging in plastics containers.*

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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.

1 Scope

This Section of BS 1133 gives guidance on the use of desiccants in packaging for general use.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Section of BS 1133 the following definitions apply.

2.1

desiccant

a material possessing a high affinity for water vapour and used to control relative humidity in sealed packages

2.2

dunnage

any hygroscopic material within the barrier other than the packaged item, e.g. packing or blocking materials, instrument cases, etc.

2.3

hygroscopic

capable of exchanging water vapour with the surrounding atmosphere. Exchange will continue until an equilibrium is reached and this is dependent upon the conditions of temperature and relative humidity of the atmosphere. Hygroscopicity is a reversible process, the hygroscopic material absorbing or desorbing water vapour to maintain equilibrium with the surrounding atmosphere

3 General

Dampness in the atmosphere encourages corrosion and the growth of moulds and bacteria even when liquid water is absent.

Steps can often be taken to reduce the deleterious effect of moisture on a packaged article by such means as the application of a temporary protective against corrosion (see BS 1133-6) to a metal surface or the proofing of textiles. However such direct protection is not practicable for all articles, for example, for certain electrical components or scientific and optical instruments. A method of providing protection in such cases is by using a completely sealed package. There may, however, still be damp air inside the container and moisture may be given off by the cushioning or bracing material used to hold the articles in position; moreover, few materials used in making sealed packages are completely resistant to the penetration of water vapour and a certain amount of moisture will reach the article through the walls of the package. Additionally temperature fluctuations can cause unacceptable humidity levels within the package without any change in absolute humidity (see 4.1).

4 Humidity

4.1 Moisture in air

Air naturally contains moisture in the form of vapour. The quantity of moisture present in a unit volume is known as the absolute humidity. At any particular temperature, air can hold only a limited amount of water vapour, the higher its temperature the more water vapour it can hold. Air containing as much water vapour as it can hold is said to be saturated. If saturated air is cooled, it will give up by condensation just enough of its moisture as liquid water to leave it saturated at the lower temperature.

The maximum quantity of moisture which can be held in vapour form by atmospheric air is determined by the temperature. Maxima for a whole range of temperatures have been accurately determined and are published as hygrometric tables and charts.

4.2 Relative humidity

Normally air is only saturated with water vapour when it is in close contact with liquid water. The actual amount of water vapour present in air (i.e. the absolute humidity), expressed as a percentage of the amount the air contains when saturated at the same temperature and pressure, is called relative humidity (r.h.). For example, if 1 m³ of air contains 5 g of water vapour and that air, if saturated at the same temperature and pressure, contains 20 g of water vapour, then the relative humidity of the air, expressed as a percentage, is:

$$\frac{5}{20} \times 100 = 25 \%$$