

Packaging code —

Section 7: Paper and board wrappers, bags and containers —

Subsection 7.5 Fibreboard cases and fitments

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Packaging and Freight Containers Standards Policy Committee (PKM/-) to Technical Committee PKM/553, upon which the following bodies were represented:

- British Fibreboard Packaging Association
- PIRA
- Telecommunication Engineering and Manufacturing Association
- Timber Packaging and Pallet Confederation
- Timber Research and Development Association
- United Kingdom Tea Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Paper and Board Industry Federation
- Chemical Industries Association
- Electronic Components Industry Federation
- Her Majesty’s Stationery Office
- Ministry of Defence

This British Standard, having been prepared under the direction of the Packaging and Freight Containers Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 January 1991

© BSI 01-2000

First published as BS 1133:Section 7 December 1943
Second edition December 1952
Third edition May 1967
Fourth edition as BS 1133:Section 7:Chapter 7.5 May 1976
Fifth edition October 1981
Sixth edition as Subsection 7.5 January 1991

The following BSI references relate to the work on this standard:
Committee reference PKM/553
Draft for comment 88/39320 DC

ISBN 0 580 18516 8

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
0 Introduction	1
1 Scope	1
2 Definitions	1
3 Application	1
4 Carriage of dangerous goods	1
5 Materials	1
6 Construction	4
7 Types of case and internal fitments	6
8 Closing and sealing	7
9 General guidance on the choice of case	10
10 Storage of cases before use	11
Appendix A The International Fibreboard Case Code (IFCC)	12
Figure 1 — Single wall corrugated fibreboard	1
Figure 2 — Typical double wall corrugated fibreboard	1
Figure 3 — Typical triple wall corrugated fibreboard	1
Figure 4 — Recyclable packaging symbol	4
Figure 5 — Methods of taping cases	8
Table 1 — Details of flute forms	2
Table 2 — General guidance on fibreboard cases for home trade use	3
Table 3 — Recommended test methods for the determination of the properties of fibreboard and fibreboard cases	4
Table 4 — Appropriate methods of closure according to case type	9
Publication(s) referred to	Inside back cover

Foreword

This Subsection of BS 1133 has been prepared under the direction of the Packaging and Freight Containers Standards Policy Committee and supersedes BS 1133:Section 7:Chapter 7.5:1981 which is withdrawn.

BS 1133 was originally issued in December 1943, primarily to give guidance on the packaging of Service and other Government supplies. In practice, however, the code was used not only by Government departments and contractors but also by civilian packers and, accordingly, it was amended to suit commercial requirements. The Parts were later issued separately and new Sections were added as new materials and methods have been developed.

Various Sections of the code have been revised and the most recent revision of the whole of Section 7 was in 1967.

Since Section 7 had become large, it was then decided to subdivide it into a number of Subsections to be published separately.

This Subsection of BS 1133 dealing with fibreboard cases and fittings is intended to assist users in choosing the case most suitable for their purpose. In order to obtain a completely satisfactory result, however, it is essential to ensure technical cooperation at all stages between the user and the manufacturer of the package and also to have regard to the means of transport.

This revision updates the guidance on fibreboard cases for home trade use in the light of current practice, recognizes the publication of appropriate BS methods of test for the determination of the properties of solid and corrugated fibreboard and deletes material which is properly specification material from this guidance document.

The packaging code now 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 by micro-organisms, insects, mites and rodents;*
- *Section 6: Temporary protection of metal surfaces against corrosion during transportation and storage;*
- *Section 7: Paper and board wrappers, bags and containers;*
- *Subsection 7.1: Wrapping papers;*
- *Subsection 7.2: Bags and envelopes;*
- *Subsection 7.3: Cartons and boxes;*
- *Subsection 7.4: Fibreboard drums;*
- *Subsection 7.5: Fibreboard cases and fittings;*
- *Subsection 7.6: Moulded pulp packaging;*
- *Subsection 7.7: Composite containers;*
- *Section 8: Wooden containers;*
- *Section 10: Metal containers;*
- *Subsection 10.1: Tins and cans;*
- *Subsection 10.2: Metal drums;*
- *Subsection 10.3: Metal collapsible tubes;*
- *Section 12: Methods of protection against shock (excluding cushioning devices);*
- *Section 13: Twines and cords for packaging;*
- *Section 14: Adhesive closing and sealing tapes;*
- *Section 15: Tensional strapping;*

- *Section 16: Adhesives for packaging;*
- *Section 18: Glass containers and closures;*
- *Subsection 1: Terminology;*
- *Section 19: Use of desiccants in packaging;*
- *Section 21: Regenerated cellulose film, plastics films, aluminium foil and flexible laminates;*
- *Section 22: Packaging in plastics containers.*

Sections 9, 11, 17 and 20 have been withdrawn.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 16, 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.

0 Introduction

It is not possible in this code to give detailed guidance on the choice of a suitable fibreboard case for all articles and commodities likely to be packed and it is essential that each problem be considered on its merits by the user and case designer. The choice of a case is governed to a large extent by the character of the contents, their mass, fragility and shape; storage, handling and transport requirements and climatic conditions.

The requirements of automatic handling systems should also be taken into account.

1 Scope

This Subsection of BS 1133 gives guidance on fibreboard cases and fitments made wholly of solid or corrugated fibreboard. It does not cover combinations of fibreboard and other materials.

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 British Standard, the definitions given in BS 3130-1 and BS 3130-2 and BS 3203 apply, together with the following:

2.1

white top kraft

a kraft liner having a complete outer furnish of bleached kraft

2.2

mottled kraft

a kraft liner having an uneven density bleached kraft outer surface so that the base colour is visible in patches

3 Application

Fibreboard cases are suitable, both as inner and outer containers, for the transport of a wide variety of goods for home trade and export, if necessary with suitable fitments.

4 Carriage of dangerous goods

Purchasers of fibreboard cases for the carriage of dangerous goods need to be aware of the statutory and international regulations relevant to the journey to be undertaken.

5 Materials

5.1 Types of fibreboard

The following types of fibreboard are used for the construction of cases.

a) Solid fibreboard. Consists of two or more layers of board laminated together with an adhesive. The board used is called “container middles” and is made from recycled paper. Usually, one or both of the outer layers is kraft paper to give a smooth surface for appearance and printing purposes.

b) Corrugated fibreboard. Consists of one or more sheets of fluted paper (fluting) secured with an adhesive to two or more liners. There are three types:

1) Single wall corrugated fibreboard.

Board consisting of one sheet of fluted paper secured between two liners (see Figure 1).



Figure 1 — Single wall corrugated fibreboard

2) Double wall corrugated fibreboard.

Board consisting of two sheets of fluted paper secured between three liners (see Figure 2).

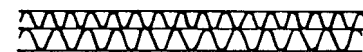


Figure 2 — Typical double wall corrugated fibreboard

3) Triple wall corrugated fibreboard.

Board consisting of three sheets of fluted paper secured between four liners (see Figure 3).

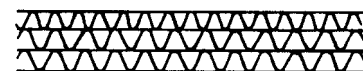


Figure 3 — Typical triple wall corrugated fibreboard

The types of flute form are given in Table 1.

Table 1 — Details of flute forms

Flute form	Approximate corrugations per metre	Approximate height of corrugations	Typical draw factors
		mm	
A flute	105 to 125	4.5 to 4.7	$1.55 \pm 5\%$
B flute	150 to 185	2.1 to 2.9	$1.33 \pm 5\%$
C flute	120 to 145	3.5 to 3.7	$1.44 \pm 5\%$
E flute	290 to 320	1.1 to 1.2	$1.27 \pm 5\%$

It is convenient when referring to generally available corrugated fibreboards to use the following abbreviations.

Kraft liner	K
Bleached kraft liner	BK
Test liner	T
Chip liner	C
Mottled kraft	MK
White top kraft	WTK

These abbreviations, with the flute designation A, B, C and E in conjunction with liner grammage can then be used to describe a corrugated fibreboard.

Each component material is described in turn, starting at the outside of the case and working inwards. The first number and letter(s) combination indicates the grammage of the outer liner and the type of material. After an oblique sign the next letter denotes the flute form and the next number and letter(s) combination, after a further oblique sign, describes the grammage and type of material of the inner liner of the case, for single wall board. Where double wall or triple wall boards are concerned, further flute form and liner descriptions are inserted, using the same notation and maintaining the order of component materials from the outside to the inside of the case (see examples).

Example 1

150K/A/150T

A flute, single wall corrugated fibreboard, outer liner 150 g/m² kraft liner, inner liner 150 g/m² test liner.

Example 2

200BK/B/125C/C/150K

BC flute, double wall corrugated fibreboard, outer liner 200 g/m² bleached kraft liner, middle wall 125 g/m² chip liner, inner liner 150 g/m² kraft liner.

NOTE The grammage and type of fluting should be agreed between customer and supplier to take account of any specific performance requirements.

5.2 Choice of materials

5.2.1 Flute form

In theory any of the flute forms listed in Table 1 may be used in single wall corrugated fibreboard and any combination of the forms could be used for double wall or triple wall corrugated.

In current practice single wall corrugated for outer containers will typically incorporate either B or C flute with E flute single wall corrugated fibreboard being used mainly for inner containers. Double wall corrugated is typically a combination of B and C flute or sometimes B and A while triple wall corrugated usually comprises combinations of A and C flute forms.

5.2.2 General purpose cases

Table 2 gives guidance on the selection of materials for the construction of general purpose cases intended for home trade use. The performance values given in Table 2 in relation to a given mass of contents are to some extent a compromise. For example a definite stacking requirement may dictate the Edge Crush Test (ECT) value required and so control the choice of material. Should protection and containment of the contents be the main requirements preliminary trials may indicate a material having a bursting strength as given in the table and such a material will usually result in the appropriate ECT value being met.

The choice between the types of corrugated fibreboard listed in Table 2 will depend on the actual packaging application. B flute is the most common flute form and gives a greater flat crush strength than C flute for a given weight of fluting medium. The surface quality of B flute board may be more suitable for high quality printing directly on the board.

C flute board contains more fluting medium per linear metre than B flute board and is thicker, both factors contributing to a higher top-to-bottom case compression strength.

C flute and double wall are more commonly used where cushioning properties are required. In addition double wall board gives very good stacking strength and resistance to side-wall bulge and will often be the better choice for the packaging of fragile products.