

BS 1133-8:2011+A1:2016



BSI Standards Publication

Packaging code

Part 8: Guidance on wooden boxes,
cases and crates

bsi.

Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© The British Standards Institution 2016

Published by BSI Standards Limited 2016

ISBN 978 0 580 95095 7

ICS 55.160

The following BSI references relate to the work on this document:

Committee reference PKW/0

Drafts for comment 11/30197409 DC, 16/30345602 DC

Publication history

First published December 1943

Second edition, December 1950

Third edition, April 1981

Fourth edition, November 1991

Fifth (present) edition, December 2011

Amendments issued since publication

Date	Text affected
------	---------------

November 2016	A1 - See Foreword
---------------	-------------------

Contents

Foreword *iv*

1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Wood for packaging	5
5	Wood-based sheet materials	18
6	Other wood-based products used in packaging	20
7	Moisture in wood and the avoidance of problems in storage and use	24
8	Fastenings	32
9	Package design	49
10	International pictorial marking symbols for the handling of goods	58
11	Dangerous goods	59
12	Wooden case, crate and box styles	60
13	Dock pallets	74
14	Skid and rail design	76
15	Crates	80
16	Sawn wood boxes	83
17	Boxes and cases of plywood and other sheet materials	87
18	Metal edged plywood boxes and cases	89
19	Wirebound cases and crates	94
20	Legality of timber products on the market (EU Directive)	103
21	Wood packaging recycling	103
22	Phytosanitary requirements for imported and exported wood packaging	103

Annexes

Annex A (informative) Health and safety	104
Annex B (informative) Table sizes for skids, sills and rails	105

Bibliography 114

List of figures

Figure 1 – Exaggerated effect of drying shrinkage	31
Figure 2 – Common packaging fasteners	33
Figure 3 – Nail head types	34
Figure 4 – Nail plate	36
Figure 5 – Ring nail after ISO test	37
Figure 6 – Types of staples	41
Figure 7 – Nail and staple patterns, boards to battens, minimum edge distance	43
Figure 8 – Fastenings of sawn boards (good and bad practice)	44
Figure 9 – Reinforcing straps on a sill base	45
Figure 10 – Tensional strapping used on a small plywood case	46
Figure 11 – Reusable spring steel fastener	47
Figure 12 – Reusable spring wire fastener	48
Figure 13 – Coach screw	48
Figure 14 – Coach bolt	48
Figure 15 – Rope handle	57
Figure 16 – Webbing handle	57
Figure 17 – International 'sling here' symbol	58
Figure 18 – Steel lifting plate for slings	58
Figure 19 – International handling symbols relevant to wooden packages	59
Figure 20 – Style 1 – Girth battened case	61
Figure 21 – Style 1 – Girth battened case with panelled ends	62
Figure 22 – Style 1 – Girth battened case, battened ends, with single diagonal braces to sides and ends	63
Figure 23 – Style 1 – 1/R, girth battened case, battened ends, reinforced base	63

Figure 24 – Style 2 – Horizontally battened case, vertically battened ends	64
Figure 25 – Style 3 – Horizontally battened case, diagonally braced	64
Figure 26 – Style 4 – Vertically boarded case, internally battened	65
Figure 27 – Style 1 – Typical case sides	65
Figure 28 – Styles 2 and 3 – Typical case sides	67
Figure 29 – Style 4 – Typical case side	68
Figure 30 – Styles 1 and 2 – Typical case ends	69
Figure 31 – Style 3 – Typical case ends	70
Figure 32 – Style 4 – Typical case end	71
Figure 33 – Typical case base styles	72
Figure 34 – Typical case lids	73
Figure 35 – Stevedore dock pallet	75
Figure 36 – Pallet bridle	75
Figure 37 – Length of subspan	77
Figure 38 – Spliced skid	79
Figure 39 – Style 11 – Light-braced crate	81
Figure 40 – Style 12 – Horizontally semi-sheathed crate, externally battened	81
Figure 41 – Style 13 – Braced crate with vertical and horizontal sheathing	82
Figure 42 – Style 14 – Light crate with continuous bracing	82
Figure 43 – Style 21 – Basic boxes	83
Figure 44 – Style 22 – Combed tenon box	84
Figure 45 – Style 23 – Internally battened box	85
Figure 46 – Style 24 – Battened end box	85
Figure 47 – Style 25 – Panelled end box	86
Figure 48 – Style 26 – Battened top and base box	86
Figure 49 – Plywood box styles	88
Figure 50 – Style of metal edged boxes and cases	90
Figure 51 – Application of the tennon	92
Figure 52 – Relevant dimensions for the two stock styles of metal edging	92
Figure 53 – Foldable metal edging in use	93
Figure 54 – Dimensions of bifurcated rivets	94
Figure 55 – Allbound wrap before assembly	95
Figure 56 – Styles of allbound cases showing construction details	96
Figure 57 – End styles for allbound boxes	97
Figure 58 – Corner styles for allbound cases and crates	98
Figure 59 – Recessed pallet designs used with wirebound pallet cases and crates	99
Figure 60 – Style 53, wirebound pallet crate with horizontal binding wires	99
Figure 61 – Alternative styles of wraps (sides)	100
Figure 62 – Alternative lid styles for wirebound pallet cases and crates	102

List of tables

Table 1 – British grown softwoods and hardwoods suitable for packaging	7
Table 2 – Imported species suitable for packaging	10
Table 3 – Strength properties of clear softwoods	14
Table 4a – Strength properties of clear ^{A)} hardwoods	15
Table 4b – Compression strengths of main species	16
Table 5 – Equivalent appearance grades of wood for packaging	17
Table 6 – Types of wood-based sheet materials	22
Table 7 – Wood equilibrium moisture content (emc) in humid air	29
Table 8 – Moisture-related movement/distortion characteristics of timbers	31
Table 9 – Types of nail used in packaging	34
Table 10 – Acceptable loading modes for the different nail types	35
Table 11 – Safe working loads (withdrawal and shear) for single nail joints in pine species, using nails 2.65 mm diameter × 50 mm long with 35 mm pointside penetration	38

Table 12 – Conversion factors for alternative nail shank diameters	38
Table 13 – Approximate count (number of nails) per kg for nails	40
Table 14 – Staple sizes	42
Table 15 – Summary of journey hazards	50
Table 16 – Acid timber species	54
Table 17 – Degree of susceptibility to attack	55
Table 18 – Results of corrosion of four metals	55
Table 19 – Style number allocation covering the main styles of boxes, cases and crates	60
Table 20 – Plywood boxes	87
Table 21 – Bifurcated rivets for metal edged cases	94
Table 22 – Size limits for metal edged cases	94
Table 23 – Binding wire characteristics	102
Table 24 – Staple wire characteristics	102
Table A.1 – Adverse effects in softwoods and hardwoods	104
Table B.1 – Skid, sill and rail working loads	106
Table B.2 – Spliced skid, sill and rail working loads	110

Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, pages 1 to 116, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2011. It was prepared by Subcommittee PKW/0/-/11, *Packaging – Wood*, under the authority of Technical Committee PKW/0, *Packaging*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 1133 supersedes BS 1133-8:2011, which is withdrawn.

Information about this document

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags $\boxed{A1}$ $\boxed{A1}$. Minor editorial changes are not tagged.

BS 1133-8:2011 was a full revision of the standard, and introduced the following principal changes:

- a change of status from code of practice to guidance document;
- the introduction of a new Annex A on health and safety issues;
- the introduction of a new Annex B on tables of sizes for skids sills and rails.

Relationship with other publications

The packaging code now consists of the following parts:

- *Part 7.6: Paper and board wrappers, bags and containers – Moulded pulp packaging;*
- *Part 10.1: Metal containers – Tins and cans;*
- *Part 10.2: Metal containers – Metal drums;*
- *Part 15: Tensional strapping;*
- *Part 18: Packaging in glass;*
- *Part 19: Use of desiccants in packaging;*
- *Part 22: Packaging in plastics containers.*

Entry and dimensional requirements for pallet bases in cases and crates are covered worldwide by BS ISO 6780 and for Europe by BS EN 13382. The two do not conflict with each other but BS ISO 6780 allows additional pallet sizes which are used across Europe since there are few compatibility issues. However, individual local commercial contracts might not permit certain pallet types, materials or sizes.

Use of this document

As a guide, this part of BS 1133 takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

Presentational conventions

The guidance in this standard is presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Currently in preview, click buy full version

Currently in preview, click buy full version

1 Scope

This part of BS 1133 provides guidance for manufacturers, users and specifiers of wooden boxes, cases and crates for industrial, defence and other commercial applications.

This document contains guidance on wood species, sheet materials and fastenings likely to be encountered by UK manufacturers or export packers and gives guidance on the design of:

- a) industrial, defence and commercial cases and crates;
- b) ranges of smaller sawn wood boxes for general use;
- c) ranges of plywood and wood-based sheet boxes and cases;
- d) plywood cases of metal edge construction;
- e) wirebound boxes, crates and cases;
- f) warehouse storage containers.

This British Standard also gives brief guidance on sustainability and recycling.

Annex A contains health and safety information.

Annex B contains tables of sizes for skids sills and rails.

NOTE 1 Knowledge of engineering principles is needed to produce a design specification from the information given in certain tables, particularly in relation to large cases and crates.

NOTE 2 Much of the information in this British Standard might also be of value in other areas where wood is used in packaging and distribution, e.g. agricultural boxes and pallets.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments, applies).

BS EN 12246, *Quality classification of timber used in pallets and packaging*

BS EN 15733-2, *Moisture content of a piece of sawn timber – Part 2: Estimation by electrical resistance method*

BS EN 13246, *Packaging – Specification for tensional steel strapping*

BS EN 13427, *Packaging – Requirements for the use of European standards in the field of packaging and packaging waste*

BS EN 22872, *Complete, filled transport packages – Method for determination of resistance to compression*

BS EN 22874, *Complete, filled transport packages – Method of test for stacking using compression tester*

BS EN ISO 2234, *Packaging – Complete, filled transport packages and unit loads – Stacking tests using a static load*

BS EN ISO 4180, *Packaging – Complete, filled transport packages – General rules for the compilation of performance test schedules*

BS EN ISO 15867, *Intermediate bulk containers (IBCs) for non-dangerous goods – Terminology*

BS ISO 6780, *Flat pallets for intercontinental materials handling – Principal dimensions and tolerances*