

Pallets for materials handling — Quality of fasteners for assembly of new and repair of used, flat, wooden pallets

ICS 55.180.20

National foreword

This British Standard reproduces verbatim ISO 15629:2002 and implements it as the UK national standard.

The UK participation in its preparation was entrusted by Technical Committee PKW/5, Primary and transport packaging, to Subcommittee PKW/5/34, Pallets, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Pallets for materials handling — Quality of fasteners for assembly of new and repair of used, flat, wooden pallets

*Palettes pour la manutention et le transport de marchandises — Qualité des
éléments de fixation pour l'assemblage et la réparation des palettes en bois*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15629 was prepared by Technical Committee ISO/TC 51, *Pallets for unit load method of materials handling*.

Annexes A, B and C of this International Standard are for information only.

Introduction

Efficient international transportation of products depends on both pallet strength and functionality, or fit, to the materials handling systems. Existing ISO standards address issues of strength and some issues regarding functionality of pallets. However, major issues related to the minimum material quality and manufacturing and repair workmanship are not addressed in current ISO standards. These factors may significantly impact the efficiency of international unit-load material handling.

In November, 1996, ISO TC 51 approved a new work item “Timber Pallets for Materials Handling — Quality of Component Assembly and Repair” and established WG 7 to prepare a document.

This International Standard contains recommended minimum acceptable quality levels for mechanical fasteners used in the assembly of wooden pallets. Mechanical fasteners commonly used for the assembly of wooden pallets are classified as nails, staples, bolts and screws. The type and properties of fasteners affect pallet performance.

This International Standard does not address safety problems, if any, associated with the use of these fasteners. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

This document addresses the current commercial difficulty in pallet manufacture, that there is no recognized means of defining pallet nails with regard to their quality and strength. Table 2 gives a guide as to strength qualities for nails which are typically used in construction of very strong pallets as opposed to pallets designed for light loads.

Actual nail diameter, profiles and strengths are the responsibility of the specifier and user who may find the full-scale pallet tests described in ISO 8611-1 of value.

In September 1999 it was decided to publish four related International Standards:

- ISO 15629:2002, *Pallets for materials handling — Quality of fasteners for assembly of new and repair of used, flat, wooden pallets*
- ISO 18333, *Pallets for materials handling — Quality of new wooden components for flat pallets*
- ISO 18334, *Pallets for materials handling — Quality of assembly of new, wooden, flat pallets*
- ISO 18613, *Repair of flat wooden pallets*

Pallets for materials handling — Quality of fasteners for assembly of new and repair of used, flat, wooden pallets

1 Scope

This International Standard gives guidelines on nails and staples used in the assembly of new and repair of used wooden flat pallets.

For the purposes of this International Standard the term fasteners applies to nails and staples only.

This International Standard is prescriptive and performance-based and contains physical descriptions of fasteners as well as minimum recommended performance levels.

For information on other fasteners such as bolts and screws used in pallets, see ISO 445.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 445, *Pallets for materials handling — Vocabulary*

ISO 12777-1, *Methods of test for pallet joints — Part 1: Determination of bending resistance of pallet nails, other dowel-type fasteners and staples*

ISO 12777-2, *Methods of test for pallet joints — Part 2: Determination of withdrawal and head pull-through resistance of pallet nails and staples*

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 445 apply together with the following.

3.1

fluted nail

round wire nail with thread-crests parallel to the nail shank

4 Nails and Staples

4.1 Classification

As used in pallets, nails are classified as plain- or smooth-shank, helical, annular ring, twisted or barbed. Staples have either round-wire or approximately square-wire legs, referring to the cross-sectional shape of the wire. Nails and staples shall be specified using at least nail wire diameter, length, thread type and point type. These and other characteristics which affect pallet nail and staple performance are listed in Table 1.

Table 1 — Physical and mechanical characteristics of nails and staples used in pallets

Nails — Shank profiles				Staples	
Plain (smooth)	Helical	Annular	Square twisted — barbed	Round wire	Square wire
Length nail (wire) diameter	Length nail (wire) diameter	Length nail (wire) diameter	Length nail (wire) diameter ^a	Length staple leg diameter	Length Staple leg width and thickness
Head diameter	Head diameter	Head diameter	Head diameter	Crown length	Crown length
—	Thread length	Thread length	—	—	—
—	Thread-crest diameter	Thread-crest diameter	Flute-crest diameter	—	—
—	Number of helixes	Number of rings	Number of helixes	—	—
—	Number of flutes	—	Number of flutes	—	—
Type of point	Type of point	Type of point	Type of point	Type of point	Type of point
Bending resistance	Bending resistance	Bending resistance	Bending resistance	Bending resistance	Bending resistance

^a The nail (wire) diameter is the thread crest diameter.

4.2 Measurement of physical characteristics

Methods of measuring the physical characteristics of nails and staples are described in annex A. When a complete assessment of fastener quality is required, separation resistance in accordance with ISO 12777-2 shall be determined by measuring both fastener shank withdrawal and head or crown pull-through. These tests shall include using wood specimens and specimen conditioning typical of those which occur during pallet use.

4.3 Minimum acceptable performance

The recommended minimum acceptable performance levels for nails and staples are specified in Table 2. Annex B is a correlation between the static bending resistance values reported in Table 2 and the MIBANT impact bend test as described in ISO 12777-1.

NOTE 1 Tests of joints containing multiple fasteners are described in ISO 12777-3.

NOTE 2 Pallet fasteners are sometimes coated. These coatings are intended to:

- increase corrosion resistance;
- improve separation resistance;
- improve drivability.

The effect of coatings on fastener performance shall be evaluated using tests described in ISO 12777-2.