

Packaging code

Section 15. Tensional strapping

Code de l'emballage
Section 15. Bandes tendues

Verpackungsleitfaden
Abschnitt 15. Spannbänder

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/572, upon which the following bodies were represented:

Adhesive Tape Manufacturers' Association
British Fibreboard Packaging Association
British Footwear Manufacturers' Association
British Paper and Board Industry Federation
British Plastics Federation
British Ports Association and the National Association of Ports Employers
British Steel Industry
British Steel Industry (Wire Section)
British Telecommunications plc
British Tensional Strapping Association
Cordage Manufacturers' Institute
Department of Trade and Industry
Food and Drink Federation
Her Majesty's Stationery Office
Ministry of Defence
Packaging and Industrial Films Association
Packaging Distributors' Association
Pira (the Research Association for the Paper and Board, Printing and Packaging Industries)
Pressure Sensitive Manufacturers' Association
Soap and Detergent Industry Association
Timber Packaging and Pallet Confederation

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 Standards Board and comes into effect on 28 June 1991

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First published December 1943
Second edition July 1949
Third edition April 1967
Fourth edition February 1975
Fifth edition November 1985
Sixth edition June 1991

The following BSI references relate to the work on this standard:
Committee reference PKM/572
Draft for comment 90/39663 DC

ISBN 0 580 19488 4

Amendments issued since publication

Amd. No.	Date	Text affected

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Foreword

This revision of this Section of BS 1133, which has been prepared under the direction of the Packaging and Freight Containers Standards Policy Committee, supersedes BS 1133 : Section 15 : 1985, which is withdrawn. Section 15 was first published in 1943 and subsequently revised in 1949, 1967, 1975 and 1985. This revision takes account of the tensional strapping currently available.

The information given in this Section is intended as a general guide. Tensional strapping has such varied applications that the particular type and strength of strapping and its method of use has to be related to the individual circumstances, and no detailed guidance can be given.

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 transport 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 fitments
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 14 Adhesive closing and sealing tapes
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

Section 9 'Textile bags, sacks and wrappings', Section 11 'Packaging felt', Section 17 'Wicker and veneer baskets' and Section 20 'Packaging for air freight excluding livestock' were withdrawn as obsolete. Section 13 'Twines and cords for packaging' is obsolescent.

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

Guide

1 Scope

This Section of BS 1133 gives guidance on the selection and use of steel and non-metallic tensional strapping. The term steel strapping covers flat band strapping and wire of round, oval or flat section. Non-metallic strapping covers weftless tapes and extruded thermoplastics tapes.

NOTE 1. BS 4853 specifies the breaking strength and dimensional tolerances of steel strapping and gives guidance on surface finishes of steel strapping. BS 6975 specifies the dimensional tolerances and tensile properties of thermoplastics and weftless (textile) strapping and gives guidance on surface finishes available.

NOTE 2. The titles of the publications referred to in this standard are listed on the inside back cover.

2 General

2.1 Applications

Tensional strapping is applied to packages by semi-automatic, automatic, or automated equipment (see clause 4) and tied or sealed while under tension. It may be applied to wooden boxes, crates, solid and corrugated fibreboard packaging cases, bundles, bales, palletized and unitized loads, to manufacturing processes, and as a safety factor in internal handling, e.g. temporary banding.

2.2 Purpose

Many of the recommendations set out in other Sections of BS 1133 provide for the use of tensional strapping, applied correctly, as an integral part of the container or package. Some reasons for this are as follows:

- (a) it reinforces and strengthens packages, protecting them against the hazards of transportation, thus assisting and ensuring safe arrival at destination;
- (b) it allows economies to be effected in load constructions and on other packaging materials;

(c) it renders the contents of the packages less liable to pilferage;

(d) it may be used as a method of closure or of reinforcing the closure.

In addition, certain conditions experienced in handling and transit require the use of strapping as an additional safeguard, e.g. load restraint.

NOTE. Some grades of tensional steel strapping are also designed to be used for mechanical lifting purposes (see BS 4853).

2.3 Choice of strapping

In determining the size, number and type of straps to be used, consideration should be given to the shape, size and distribution of mass of the package or load, the material from which it is made, and the handling, storage and transport conditions likely to be encountered.

3 Materials

3.1 Steel strapping

BS 4853 specifies the types of steel strapping available. Table 1 gives the available surface finishes for the various types of steel strapping.

3.2 Non-metallic strapping

3.2.1 General

BS 6975 specifies the types of non-metallic strapping available.

3.2.2 Weftless strapping

Weftless strapping consists of continuous strands of high tensile textile material laid side by side, and bonded together with suitable adhesives. Thickness varies according to the density of yarn used in its construction.

Weftless strapping is generally available in widths from 6 mm to 25 mm.

Table 1. Surface finishes for tensional steel strapping

Surface finish	Cold rolled	Hot rolled	Wire	Stainless steel
Natural		×	×	×
Bright	×			×
Blued	×			
Blued and waxed	×			
Painted	×	×		
Painted and waxed	×			
Electro-zinc galvanized	×	×		
Hot-dipped galvanized	×	×		
Close-wiped galvanized			×	
Copper coated			×	
Printed	×	×		

NOTE. This table, whilst intended to be helpful and informative, does not guarantee that the particular size, quality and finish desired is in normal commercial production and users are advised to check with their supplier before ordering.



3.2.3 Thermoplastics strapping

Thermoplastics strapping is an extrusion, generally of rectangular cross section, in which high tensile strength has been developed by orientation.

Thermoplastics strapping is generally available in widths ranging from 5 mm to 25 mm and various thicknesses.

3.2.4 Surface finishes

Table 2 gives the available surface finishes for the different types of non-metallic strapping.

4 Types of equipment

The types of equipment generally available and the types of strapping with which they are normally used are listed in table 3. There is a full range of options with various degrees of mechanization with additional options, if required.

The advice and guidance of manufacturers are offered freely in evaluating the requirements of a given strapping application and recommending suitable systems. Within the types of equipment set out in table 3 there are obviously special features designed for specialized applications as well as secondary factors which will enhance standard equipment. Suppliers will provide the detailed information upon which a choice can be made.

Semi-automatic, automatic and automated types of strapping equipment are classified as follows.

(a) *Semi-automatic*. Machinery, generally static, which does not have a fixed track for feeding strapping around the article to be strapped. Feeding is by hand, the machine operator placing the leading end of a strap into the mechanism so that the remaining operations of the cycle, i.e. tensioning, sealing and cutting off, can be completed.

(b) *Automatic*. Machinery with a fixed track for feeding the strapping. All operations of the complete strapping cycle are carried out on activation of the start control.

(c) *Automated*. Automatic machinery with additional electronic or other controls and a powered method of presenting packs to the strapping machine. An automated system could be capable, without the presence of an operator, of controlling the input flow of packs, strapping them at the correct points for the requisite number of straps to be applied (at predetermined positions), activating the strapping machine and ejecting the strapped pack. Automation is a control system of variable sophistication, according to the requirements of the user and the strapping application.

Table 2. Surface finishes for non-metallic tensional strapping

Surface finish	Wetless strapping		Thermoplastics strapping	
	Viscose	Polyester	Polypropylene	Polyester
Natural	×	×	×	×
Coloured	×	×	×	×
Smooth	×	×	×	×
Embossed			×	×
Plain	×	×	×	×
Printed	×	×	×	×

Table 3. Types of equipment

Equipment	Cold rolled	Hot rolled	Wire	Stainless steel	Wetless	Thermoplastics
Hand operated	×	×	×	×	×	×
Power assisted, portable	×	×		×	×	×
Fully powered, portable	×	×		×		×
Semi-automatic machines	×		×			×
Automatic machines	×		×		×	×
Automated machines	×		×			×
Semi-automatic pack compression	×					×
Automatic machines with pack compression	×				×	×
Custom built automatic systems	×					×

NOTE. Suppliers should be consulted to advise on the suitability of strapping to meet the requirements of specific application equipment.