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TEXTILE BAGS, SACKS AND WRAPPINGS

**B.S. 1133
PACKAGING CODE**

BRITISH STANDARDS INSTITUTION

B.S. 1133 : SECTION 9 : 1967

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PACKAGING CODE**

BRITISH STANDARDS INSTITUTION

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THIS SECTION of B.S. 1133, 'Packaging Code', having been approved by the Packaging Standards Committee, was published under the authority of the General Council on 31st May, 1967.

First published, 1943.

First revision, May, 1950.

Second revision, May, 1967.

The Institution desires to call attention to the fact that this Packaging Code does not purport to include all the necessary provisions of a contract.

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 9,000, fully indexed and with a note of the contents of each, will be found in the BSI Catalogue which may be purchased from BSI Sales Department. The Catalogue may be consulted in many public libraries and similar institutions.

This section of B.S. 1133 makes reference to the following British Standards:

B.S. 1214. Hessian sandbags and rot-proofed hessian sandbags.

B.S. 2087. Chemical requirements for textiles treated by certain preservative processes.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following B.S.I. references relate to the work on this standard:
Committee references P.117, P.118.
Draft for comment D63.12574.

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CO-OPERATING ORGANIZATIONS

The Packaging Standards Committee, under whose supervision this Packaging Code was prepared, consists of representatives from the following Government Departments and scientific and industrial organizations:

Association of Steel Drum Manufacturers
 Board of Trade
 British Carton Association
 British Jute Trade Federal Council
 British Paper Bag Federation
 British Paper and Board Makers' Association
 British Paper Box Federation
 British Plastics Federation
 *British Railways Board
 British Tin Box Manufacturers' Federation
 *Chemical Industries Association
 Collapsible Tube Manufacturers' Association
 Crown Agents for Overseas Governments and Administrations
 Envelope Makers' and Manufacturing Stationers' Association
 Fibreboard Packing Case Manufacturers' Association
 Food Manufacturers' Federation Incorporated
 Glass Manufacturers' Federation
 Institute of Packaging
 Institution of Production Engineers
 *Ministry of Technology
 Ministry of Transport
 Packaging Films Manufacturers' Association
 Paintmakers' Association of Great Britain
 Society of British Soap Makers
 Society of Motor Manufacturers and Traders Limited
 Timber Container Confederation

The Government department and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this section of the Packaging Code:

Association of Jute Spinners and Manufacturers
 British Jute Trade Research Association
 British Sugar Refiners' Association
 Compound Animal Feeding Stuffs Manufacturers' National Association
 Cotton Bag Manufacturers' Association
 Fertiliser Manufacturers' Association
 Incorporated National Association of British and Irish Millers Limited
 Indian Jute Mills Association
 Jute Sack and Bag Manufacturers' Association
 London Chamber of Commerce
 Ministry of Defence
 National Association of Corn and Agricultural Merchants Limited
 National Association of Sack Merchants and Reclaimers Limited
 National Farmers Union
 Textile Institute
 United Kingdom Jute Goods Association

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FOREWORD

B.S. 1133, 'Packaging Code,' was originally issued in December, 1943 to give guidance on the packaging of Service and other Government supplies. The Committees responsible for its preparation had to take into account both the war-time shortages of packaging materials and the exceptional hazards of transport; the Code was nevertheless used not only by Government departments and contractors but also by civilian packers.

The Packaging Standards Committee, after careful consideration, unanimously agreed that the Code, suitably amended to suit peacetime requirements, would continue to be of value to container makers and packers, and revisions of the various sections were undertaken. Section 9 was first revised in 1950.

This revision is a further measure to improve and bring up to date the original publication. The principal changes are to be found in Subsection A, 'Jute bags, sacks and wrappings.' A fuller general description of jute bags and considerations relating to handling, storage, branding and other aspects of packaging has been included. The illustrations have been improved and a clearer and more satisfactory method of calculating sack sizes in relation to the commodities to be packed has been incorporated.

The Packaging Code now consists of the following Sections all of which are published separately with the exception of Sections 1-3 which are published in one volume. It may be convenient for readers to know that a binder is available so that any two or more sections can be brought together under one cover.

Sections 1-3. Introduction to packaging.

Section 1 gives general guidance on the choice of containers, precautions to be taken in the packaging and choice of packaging methods, and notes relating to physical and statutory limitations and packing bay conditions. An appendix describes the categories of methods of packaging recommended by the Services. Section 2 gives recommendations in regard to the storage of packaging materials and deals with covered and open storage, weight limitations, fire hazards, dangerous goods and inspection.

Section 3 gives guidance on the addressing, marking and labelling of containers.

Section 4. Mechanical aids in package handling.

Describes briefly the many types of mechanical handling equipment suitable for the moving of packaging materials and filled packages in factories and warehouses. Also gives notes to assist users in selecting equipment and using it to the best advantage.

Section 5. Protection against spoilage of packages and their contents by micro-organisms, insects, mites and rodents.

Gives guidance on the avoidance of damage to packages and their contents from attack from moulds, bacteria, insects, mites and rodents.

Section 6. Temporary protection of metal surfaces against corrosion (during transportation and storage).

Gives guidance on the cleaning and drying of metal surfaces prior to the application of temporary (i.e. easily removable) protectives against corrosion and on the selection and application of the protectives. Performance specifications are included for seven types of protectives against corrosion together with methods of test.

Section 7. Paper and board wrappers, bags and containers.

Gives general guidance on the use of paper and board in the following forms: Wrapping papers, waxed paper, greaseproof paper, glassine, vegetable parchment, waterproof paper, wet strength paper, bags, envelopes, multiwall sacks, liners and linings, paperboard cartons and boxes, composites, moulded pulp, and fibreboard cases and drums. Methods of test are also given.

Section 8. Wooden containers.

Gives general information regarding the styles, design and construction of large framed wooden cases, nailed wooden cases, wirebound wooden boxes, plywood cases of battened and metal edged construction, plywood postal type boxes, wooden casks, plywood barrels, veneer casks, wooden crates, metal-lined cases and closures for returnable cases.

Section 9. Textile bags, sacks and wrappings.

Describes and defines materials and methods of stitching and closing jute bags. Cotton bags are also dealt with. Methods of baling and the jute materials to be used are described, and typical specifications are given.

Section 10. Metal containers.

Gives descriptions of the materials and construction for tins and cans, drums, crates, hampers and trays, collapsible tubes and composites. Includes many illustrations of types of containers and their closures. For tins and cans also describes decoration, testing, filling and closing. For collapsible tubes, covers sizes, weights, decoration, filling, and packaging for transport.

Section 11. Packaging felt.

Covers pressed felts and needle-loom felts for cushioning against shock. It describes 5 types of felt, and methods of proofing. Chemical requirements are specified, together with methods of test.

Section 12. Cushioning materials and suspension packing (excluding packaging felt).

Gives general information on cushioning, and describes cushioning materials in the form of cellular rubber, cellulose wadding, cotton waste, cork, corrugated and embossed papers, fibreboard, moulded pulp, paper shavings, plastics, rubberized hair, wood wool and miscellaneous cushioning materials. Methods of suspension packing with springs and rubber are described.

Section 13. Twines and cords for packaging.

Gives guidance on the types of twine and cords available for packaging and the purposes for which they may be used.

Section 14. Adhesive closing and sealing tapes.

Gives general guidance, with illustrations, on the uses and various properties of gummed tape and self adhesive tape available for packaging purposes.

Section 15. Tensional steel strapping.

Gives guidance on the use of tensional steel strapping for packaging purposes. It covers flat band and wire strapping and the machines used for applying both kinds of strapping.

Section 16. Adhesives for packaging.

Describes the characteristics and use of the principal types of adhesive used in packaging.

Section 17. Wicker and veneer baskets.

Gives general descriptions and definitions relating to wicker baskets and hampers and veneer baskets (chips) and punnets.

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Section 18. Glass containers.

Gives general guidance on the types of glass containers available for packaging and describes the factors to be considered when ordering or using them. Details of various forms of closures are also given.

Section 19. Use of desiccants in packaging.

Gives guidance on the use of desiccated packages, the factors governing the choice of desiccant, determination of quantity of desiccant and general considerations affecting this method of packaging.

Section 20. Packaging for air freight (excluding livestock).

Gives general guidance on the special problems of packaging for air freight in relation to different types of containers; also includes clauses on the general precautions to be taken in the carriage of machinery, fragile items, restricted articles, obnoxious cargo, and cargo susceptible to variations in temperature. Prohibited packaging materials, labelling and marking are also discussed.

Section 21. Transparent cellulose films, plastics films, metal foil and flexible laminates.

Gives general information and guidance on the manufacture, properties and uses of various forms of these four types of material.

Section 22. Plastics containers (in preparation).

NOTE 1. Where metric equivalents are stated the figures in British units are to be regarded as the standard. The metric conversions are approximate; more accurate conversions should be based on the tables in B.S. 350, 'Conversion factors and tables'.

NOTE 2. In place of the customary, but incorrect, use of the pound and kilogramme as units of force, the units called pound-force (abbreviation lbf) and kilogramme-force (abbreviation kgf) have been used in this standard. These are forces which, when acting on a body of mass one pound or one kilogramme respectively, give it an acceleration equal to that of standard gravity.

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SECTION 9

TEXTILE BAGS, SACKS AND WRAPPINGS

A. JUTE BAGS, SACKS AND WRAPPINGS

1. GENERAL

Jute in the form of cloth, sacks and bags is extensively used as a packaging material for a wide variety of commodities, particularly at stages prior to retail sale.

The material is woven on flat or circular looms by textile processes from a natural fibre with the basic qualities of strength and rigidity combined with a low extensibility; these properties ensure that the size and shape of the final package or container are maintained under a sustained load. Other recognized properties of jute material are its high tear-resistance, its substantial breaking load characteristics, and its durability which enables it to be used many times over with consequent savings in packaging costs.

a. Selection. Jute materials for packaging are of many descriptions and a great number of different structures. These range from a light wide-open mesh weave to the heaviest and closest of weaves.

For the packer, the choice of material depends on many factors including:

- (i) Nature of the contents to be packed.
- (ii) Conditions of storage.
- (iii) Means of handling and transportation.
- (iv) Impermeability of any secondary packaging materials.

Jute is a long-established form of packaging and a good deal of knowledge and experience has been accumulated on the type of material best suited for most commodities. When problems arise such as the introduction of new products on methods of handling, the packer should seek technical advice from his jute supplier.

Jute will perform its function for most purposes without any finishing treatment other than the various types of mechanical finish. If conditions of use are extremely arduous, however, a number of chemical proofing agencies may be applied to give better performance.

Where there is risk of percolation of fine powders or for the transport of moisture-sensitive materials, composite constructions of jute and paper or plastics film are recommended. These may be in bag or sheet form.

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b. Handling. The manual handling of jute packages offers no special difficulty as the rough texture of the material enables a good grip to be made. The recognized methods of manual handling should be followed. The strength and abrasion-resistance of jute packaging is also advantageous to mechanical handling and a wide range of appliances and equipment are now available to facilitate loading, stacking or destacking.

c. Storage. Jute materials are capable of withstanding normal stresses of weather and climate, and no difficulty should be experienced provided that the package contents do not themselves exert a degrading effect. Filled and empty sacks are best stored off the ground on a low platform in well constructed stacks in cool, dimly lit and well ventilated conditions. Storage for any length of time under direct sunlight should be avoided: this may cause surface fibres to become brittle although the tensile strength will be little affected unless the exposure to sunlight is unduly prolonged.

d. Stacking. Filled jute sacks may be stacked to a considerable height without bursting those in the lower tiers. The sacks should be built into a stack in a systematic building or brickwork pattern. Good stacking prevents localized stresses which may cause sack breakage. A useful feature to remember is that sacks have a coherence when stacked out of the vertical because of the non-slip surface of jute cloth.

e. Branding. Single or multi-colour printing of the customer's brand or directions to the consumer can be undertaken by sack manufacturers at relatively low cost.

2. NOMENCLATURE

For the purposes of this Code the following nomenclature applies:

a. Jute yarn, twist and cloth.

(i) *Jute yarn (thread).* The 'count' of jute yarn is defined as the weight in pounds of 14 400 yards (14 400 yards being the unit of measure, named 'spynle'). To convert to *Tex yarn count, multiply by 34.45.

(ii) *Jute twist.* Two or more strands of single yarn twisted together to form one thread, e.g. 4 ply 7 lb yarn, means 4 strands of 7 lb yarn twisted together.

*The Tex system is the way of designating yarn count recommended by the International Organization for Standardization for universal adoption. The yarn count in the Tex system is obtained by dividing the mass in grammes of a given length of yarn by its length in kilometres; the unit in this system is the tex.

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(iii) *Jute cloth* is specified by:

Width and length of piece required.

Weight (see definition in Clause 3).

Place of origin (e.g., Dundee, Calcutta).

Type of weave (e.g., hessian, tarpauling, bagging or sacking).

Porter (see definition).

Shots per inch in finished cloth (see definition of shot).

Finish and make up.

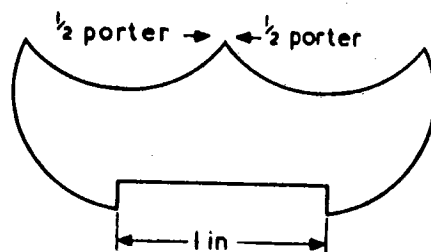


Fig. 1. Porter measure (1 porter = $\frac{37}{20}$ th in)

A. WARP. The threads of a fabric running lengthwise or parallel to the selvage.

Reed. A rectangular frame with vertical wires designed to keep the warp threads of a fabric evenly spaced during weaving.

Split. A space between the vertical wires of the reed, through which one or more warp threads are drawn.

Porter. The porter system is used for regulating and measuring the closeness of warp threads in jute fabrics. The 'porter measure' (sometimes called a 'porter glass' or 'porter gauge') is a length of $\frac{37}{20}$ th of one inch (47 mm) (see Fig. 1). To determine the porter of a jute fabric warp, first count the number of *single* threads occurring between the limits of the $\frac{1}{2}$ porter measure, i.e. in $\frac{37}{40}$ th inch (23.5 mm). Do this in a number of places across the warp and take the average. Let this average be N single threads, then, according to the type of weave, the porter may be calculated as follows:

Weave	Porter
Hessian	N
D.W. Bagging and tarpauling	$N \div 2$
Twilled sacking	$N \div 3$

The porter for 'Dundee' cloth refers to the thread spacing in the reed used in the loom and, owing to the width shrinkage which occurs during weaving and

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finishing, the warp threads are drawn slightly closer together in the final cloth. Thus the measured cloth porter will be slightly more than the stated porter. For example, a 10 porter 'Dundee' hessian has approximately 11 threads per inch (25.4 mm) in the reed and $11\frac{1}{2}$ per inch in the finished cloth.

The porter for 'Calcutta' cloth refers to the finished fabric. Hence the porter, weave and make (i.e. Dundee or Calcutta) should be mentioned together in designating the warp.

In this Section of B.S. 1133, 'Packaging Code', in Tables 1, 2, 3 and 4, threads per inch are recorded as well as porter.

Where it is desired to obtain cloth with an exact spacing of warp threads, it is better to specify the warp thread spacing directly in terms of threads per inch.

B. WEFT. The crosswise threads of a fabric, i.e., the threads that run from selvedge to selvedge.

Shot. One thread of weft yarn.

C. FINISH. *Jute cloth.*

The finishing of jute fabrics may be accomplished by:

Cropping.

Calendering or cylindering.

Chesting.

Mangling.

Cropping. A process whereby the short protruding fibres on cloth are removed by sharpened, spiral blades similar to those of a lawn mower.

Calendering or cylindering. A process whereby cloth, which may have been dampened, is run under pressure between two or more alternate steel and compressed-paper covered cylinders (bowls). One of the steel cylinders is usually heated. This process flattens the threads, and the machine in which the process takes place is known as a calender.

Chesting. A process whereby cloth after passing between all the bowls of a calender (usually five) from bottom to top, is wound upon itself on either of the two upper bowls and later stripped therefrom. This process reduces the size of the interstices between threads.

Mangling. A process whereby cloth, which has previously been calendered or cylindered, is rolled on a steel pin and rotated backwards and forwards under pressure a number of times between two steel bowls. Mangling closes the interstices between threads more effectively than chesting. The machine in which the process takes place is known as a mangle.

D. MAKE-UP. Jute cloth.

After finishing, or in the loom state (unfinished), jute cloth may be delivered either 'unmade up' or 'made up'. If 'unmade up', the pieces of cloth are secured in the condition in which they are delivered by the measuring machine, and in this form are known as 'loose' or 'loose for bags'.

'Made up' cloth may be:

- | | | |
|-------|--|---|
| (1) { | Crisped (C)
or
Full width (F.W.) | i.e. folded selvedge to selvedge.

i.e. not crisped. |
| (2) { | Rolled (R)
or
Lapped (L) | i.e. in rolls.

i.e. continuously laid backwards and forwards in predetermined lengths, usually 90 inches (2.29 m). |
| (3) { | Tied (T)
or
Stitched (S) | i.e. tied with string at two or more places round the circumference of the piece to maintain its shape.

i.e. secured by stitching at several places to maintain the shape. |
| (4) { | Marked
or
Labelled | i.e. stencilled with particulars of length (<i>L</i>) and width (<i>W</i>) or breadth (<i>B</i>), and any other particulars. |

'Make up' is usually designated by abbreviations; thus cloth specified:

C.R. & S. means Crisped, rolled and stitched;

L.F.W. & T. means: Lapped full width and tied.

'Cloth specified to be 'marked L & B' means that it is to be marked with the length and breadth.

b. Bags, sacks and wrappings.

Bags and sacks are normally described by the external measurements, weight and the material from which they are made. Where, however, accurate calculation of volume is required, it is essential to use internal measurements (see Clause 9).

(i) The words 'sack' and 'bag' are synonymous in the jute industry, but in this Code, 'sacks' usually refers to those made from twilled sacking, and 'bags' usually to those made from hessian, bagging or tarpauling.

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(ii) *Valves*. A valved bag or sack is provided with an opening in one corner only, through which the filling tube of the packing machine is inserted. Valved bags and sacks are, to a large extent, self-closing, but with certain commodities, internal or external sleeves are fitted to prevent both sifting and contamination of the contents. Types of valves commonly used are shown in Figs. 13 and 14.

(iii) *Bias tubing*. Considerable quantities of jute hessian are used for wrapping rolls and other shapes of various commodities such as linoleum, carpets, etc., for which sacks are not a suitable form of packing. Saving both in material and labour may be effected by using the hessian sewn up in the form of bias tubing. This permits an elasticity not present when jute hessian in the woven width is used. One width of bias tubing will give a snug fit to any one of a range of package sizes, giving a neat, smooth package. All widths of tubing adapt themselves readily to any length and almost any shape.

The method of use is as follows:

A. The tube from the roll is drawn over the package, rather like a sock, leaving sufficient to cover the bottom of the package. See Fig. 15.

B. The bottom end is gathered and tightly tied with wire by means of a special twisting tool. See Fig. 16.

C. The slack is then taken up at the other end of the packages and fastened similarly. See Fig. 17.

D. The tube is then cut off two to three inches beyond the wire tie. See Fig. 18.

c. *Yarn count*.

(i) *Cotton*. The 'count' of cotton yarn used for sewing jute bags and sacks is defined as the number of hanks of 840 yards (768 m) which weigh 1 lb (0.5 kg). Hence 8s cotton = $8 \times 840 = 6720$ yd/lb. (To convert into Tex yarn count, divide into 590.5).

(ii) *Flax and hemp*. The count of flax and hemp twine used for sewing jute bags and sacks is normally the same as the count of jute yarns and twist, but the linen count is also used (i.e. the Lea count).

'Lea' is defined as the number of hanks of 300 yards (274 m) which weigh 1 lb (0.5 kg)

Hence: Lea = $48 \div \text{lb/spynde}$,

e.g., $48 \div 16 \text{ lb/spynde} = 3 \text{ Lea}$.

(To convert 'Lea' into Tex yarn count, divide into 1654).

3. MATERIALS

The jute bags, sacks and wrappings provided for in this Code are made from the following jute cloths:

- a. *Hessian (plain weave)* (see Fig. 2).
- b. *Double warp (DW) tarpauling* (see Fig. 3). Tarpauling is a double warp, single weft, plain woven cloth of finer construction than bagging. *Tarpaulin* is a made up article usually made of tarpauling or other heavy cloth.
- c. *Double warp (DW) bagging* (see Fig. 4). Bagging is usually a coarser cloth than tarpauling.
- d. *Twilled sacking*, or simply *twill* (see Figs. 5 and 6). This is usually double warp. A fabric with a diagonal line in the weave running from selvedge to selvedge.

e. *Jute cloth, paper-lined*, i.e., laminated jute fabric and paper united by bitumen or other adhesive (see Table 7).

The weights quoted in this Code for hessians, tarpaulings, baggings and sackings, refer to the approximate weight of a linear yard of cloth averaged over a bulk delivery.

(i) *Hessians* of normal constructions (see Tables 1 and 2) are specified by width required, the average weight in ounces (1 oz = 28 g) per linear yard (0.914 m) of material of not less than 40 in (1.02 m) width, and place of origin.

For instance, '60 inch 6 oz/40 in 'Dundee' hessian' means that the cloth required will measure 60 inches (1.5 m) wide, weigh approximately 6 ounces (168 g) per linear yard (914 mm) of 40 inch (1 m) width material (i.e. 9 oz (252 g) per linear yard (914 mm) of 60 inch (1.5 m) width material) and be of 'Dundee' manufacture.

With hessians of construction other than normal, particulars of porter and shots require to be specified in addition.

(ii) *Tarpaulings, baggings and sackings* are usually specified by width required, porter, the average approximate weight per linear yard of whatever width is normal, and by the place of origin.

For instance, '45 inch 6/14/27 inch (or 45 inch 6/27/14 oz) 'Dundee' twilled sacking', means that the cloth required will measure 45 inches (1.12 m) wide, 6 porter construction, weight approximately 14 ounces (392 g) per linear yard of material 27 inches (686 mm) wide (i.e. 23.3 oz (652 g) per linear yard (914 mm) of 45 inch (1.12 m) width material) and be of 'Dundee' manufacture.

In many such cloths the shots per inch are normal and assumed (see Table 4). Shots per inch, however, must be specified in all cases where shotting other than normal is required.

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TABLE 1. DUNDEE HESSIANS*

The following are details of representative 'Dundee' hessians, but these cloths can be supplied in a wide variety of widths, weights, porters and shots.

Weight		Width		Porter	Shots	Threads per inch (per 25 mm) in finished cloth (approximately)	
						Warp	Weft
oz	g	in	m				
6	170	40	1.02	7	7½	8	7½
6½	184	40	1.02	7 or 7½ or 8	8½ 8 7½/8	8 8½ 9	8½ 8 7½/8
7	198	40	1.02	8	8½	9	8½
7½	213	40	1.02	8 or 8½ or 9	9½ 9 8½/9	9 10 10½	9½ 9 8½/9
8	227	40	1.02	9	10	10½	10
8½	241	40	1.02	9 or 10	11 10	10½ 11½	11 10
9	255	40	1.02	10	11	11½	11
9½	269	40	1.02	10	11½	11½	11½
10	283	40	1.02	10	12	11½	12
10½ and upwards	298	40	1.02	11	13	12½	13

* 'Dundee' porters are measured according to the reed put into the loom and 'Calcutta' porters in the finished cloth. This gives a difference of about half a thread per inch in the warp, thus 'Dundee' 10 porters are about equal to 'Calcutta' 10½ porters.

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TABLE 2. CALCUTTA HESSIANS*

The following are details of representative Calcutta hessians, but these cloths can be supplied in a variety of widths, weights, porters and shots.

Weight		Width		Porter	Shots	Threads per inch (per 25 mm) in finished cloth (approximately)	
						Warp	Weft
oz	g	in	m				
6	170	40	1.02	7	7½	7½/8	7½
6½	184	40	1.02	7 or 8	8 8	7½/8 8½/9	8 8
7	198	40	1.02	8 or 9	9 8	8½/9 10	9 8
7½	213	40	1.02	9	9	10	9
8	227	40	1.02	9	10	10	10
8½	241	40	1.02	9	10	10	10
9	255	40	1.02	9	10	10	10
9½	269	40	1.02	10 or 11	11 10	11 12	11 10
10	284	40	1.02	11	12	12	12
10½	298	40	1.02	11	12	12	12
11	312	40	1.02	11	12	12	12
11	312	45	1.14	11	12	12	12
12	340	40	1.02	11	12	12	12

* 'Dundee' porters are measured according to the reed put into the loom and 'Calcutta' porters in the finished cloth. This gives a difference of about half a thread per inch in the warp; thus 'Dundee' 10 porters are about equal to 'Calcutta' 10½ porters.

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TABLE 3. D. W. TARPAULING AND D.W. BAGGING

The following are details of representative D.W. tarpauling and D.W. bagging, but these cloths can be supplied in a wide variety of widths, weights, porters and shots.

Cloth	Weight		Width		Porter	Shots	Threads per inch (25 mm) in finished cloth (approximately)	
							Warp	Weft
Tarpauling	oz 12½	g 354	in 26	m 0.66	14	15/16	15½ double threads	15/16
Bagging	16	454	36	0.91	7	9	8 double threads	9

NOTE. D.W. tarpaulings and D.W. baggings are woven with two double threads (4 threads) in each split.

TABLE 4. TWILLED SACKING

The following are details of representative twilled sackings, but these cloths can be supplied in a wide variety of widths, weights, porters and shots.

Weight		Width		Porter	Shots	Threads per inch (25 mm) in finished cloth (approximately)	
						Warp	Weft
oz	g	in	m			double threads	
13	369	22	0.56	8 or 10	8 11	13 16	8 11
14	397	27	0.69	6	8	10	8
16	454	27	0.69	8	8	13	8
16	454	26	0.66	10 or 10	11 12	16 16	11 12
17½	496	29	0.74	10 or 10 or 12	11 12 12	16 16 19	11 12 12
20	567	28	0.71	10	12	16	12

NOTE. Twilled sackings are woven with three double threads (6 threads) in each split.

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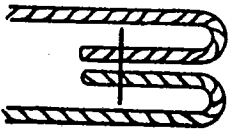
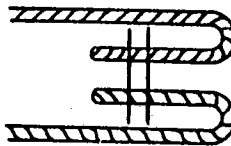
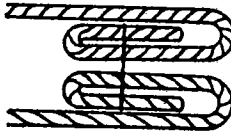
4. PROOFING

There are various treatments available for waterproofing, rot-proofing and for increasing the resistance to fire of jute materials. B.S. 2087, 'Chemical requirements for textiles treated by certain preservative processes', gives details of treatments for application to textiles which will afford some protection against degradation and rotting. The guidance of the manufacturer should be sought on this matter.

5. FABRICATION OF BAGS AND SACKS

a. Seaming and hemming. The seams and hems recommended in this Code are shown in Table 5.

TABLE 5. TYPES OF SEAMING AND HEMMING

Type of seam or hem	Type of stitching (See Table 6)	Diagram of seam or hem (shaded lines—cloth; plain lines—stitching)
A. Plain seams. Sewn through two thicknesses of cloth. Bag turned after sewing.	Union	
B. Plain seam double sewn. Sewn through two thicknesses of cloth. Bag turned after sewing.	Union	
C. Counterlaid seam. Sewn through four thicknesses of cloth. Bag turned after sewing.	Union	
D. Counterlaid seam double sewn. Sewn through four thicknesses of cloth. Bag turned after sewing.	Union	