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Indian Standard
SPECIFICATION FOR
NON-RETURNABLE WOODEN BOXES FOR
HORTICULTURE PRODUCE

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SPECIFICATION FOR NON-RETURNABLE WOODEN BOXES FOR HORTICULTURE PRODUCE

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Indian Standard

SPECIFICATION FOR NON-RETURNABLE WOODEN BOXES FOR HORTICULTURE PRODUCE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 August 1980, after the draft finalized by the Wood and Wood Products Containers Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 The non-returnable wooden boxes are used as 'orchard' boxes for the overall process of picking, storage and final sales for fruits, like apples, pears, cherries, grapes, leechies, etc. These non-returnable boxes are generally convenient as pre-packed produce in bulk.

0.3 The boxes are designed in such a way as to avoid any damage to the contents particularly when the boxes are used for storage. The gap between component battens of the boxes are generally restricted to 6 mm, apart from 15 mm allowed for entering all fingers in lifting.

0.4 The use of this standard will help in preserving fruit produce and guide all concerned of use of these boxes.

1. SCOPE

1.1 This standard specifies material and constructional details of non-returnable wooden boxes for horticulture produce up to a maximum mass of 20 kg of contents.

2. TYPES

2.1 The following types of boxes shall be used:

Type 1—Non-returnable wooden box with corner posts, of nailed or stitched construction (*see* Fig. 1).

Type 2—Non-returnable wooden box with raised ends and exterior battens, of nailed construction (*see* Fig. 2).

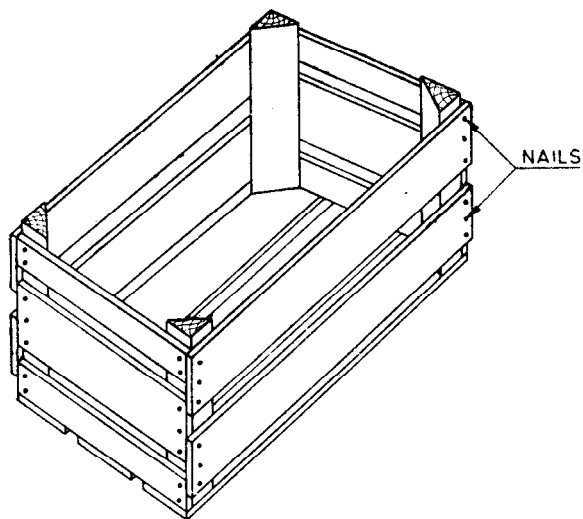
3. DIMENSIONS

3.1 Boxes — The dimensions of the boxes shall be as agreed between the purchaser and the supplier for different type of fruits.

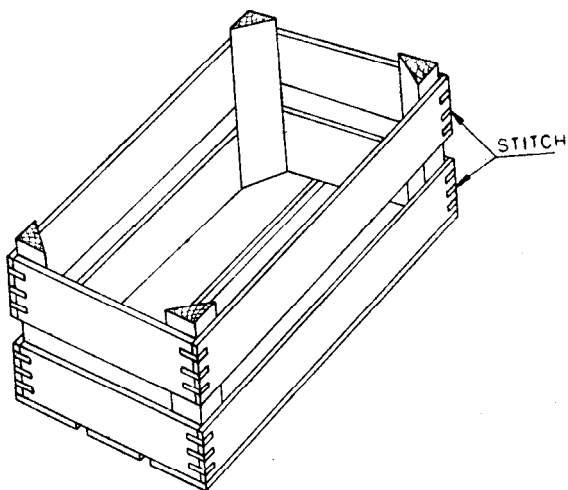
3.2 Tolerances — The dimensions of wooden components of boxes shall be governed by the following tolerances:

Thickness of planks ± 1 mm

Width of planks ± 2 mm



IA Nailed Box



IB Stitched Box

FIG. 1 NON-RETURNABLE WOODEN BOX WITH CORNER POSTS

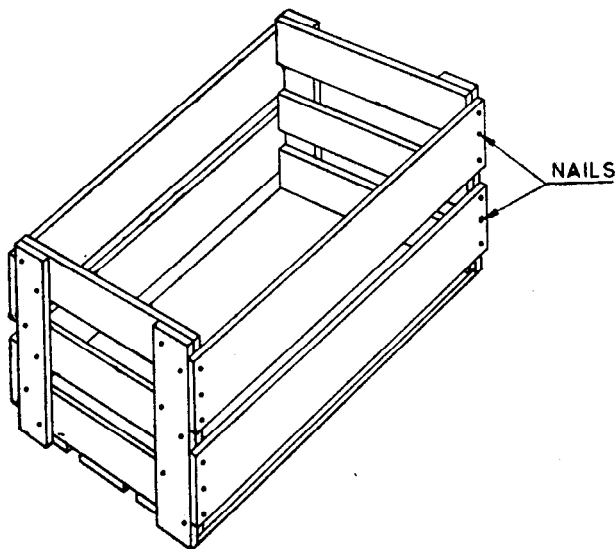


FIG. 2 NON-RETURNABLE WOODEN BOX WITH RAISED AND EXTERIOR BATTENS (NAILED)

4. MATERIALS

4.1 The timber used in the construction of the boxes shall have a moisture content not exceeding 18 percent. It shall be sound and reasonably free from large knots, cross-grain and defects that materially weaken the box.

4.2 A list of timber species suitable for the manufacture of wooden boxes for apples and other produce, are given in Appendix A.

5. CONSTRUCTION

5.1 The boxes shall be constructed as illustrated in Fig. 1A and 1B or Fig. 2 according to the type and construction ordered by the purchaser.

5.2 The gaps between the upper end planks and the end planks immediately below the upper end planks shall be not less than 15 mm. All other gaps between planks shall be not greater than 6 mm.

5.3 In case of nailed box, the nails through battens into ends shall be clinched.

5.4 In case of stitched box the stitching wire shall be steel wire galvanized or otherwise rendered rust resistant. Stitches shall be positioned as shown in Fig. 1B.

6. ORDERING

6.1 The following information shall be supplied by the purchaser when ordering for the boxes in accordance with this specification.

6.1.1 Whether type 1 boxes with corner posts or type 2 boxes with raised ends are required.

6.1.2 When type 1 boxes are ordered whether these are to be of nailed or stitched construction.

7. PERFORMANCE TEST

7.1 Boxes ready for use shall be subjected to the following tests:

- a) *Drop Test*— The samples as selected in accordance with **8.2** shall be filled with the equivalent mass of contents and each box shall be subjected to two drops from a height of 1 m. The method of tests shall be as prescribed in IS : 7028 (Part IV)-1973*.
- b) *Stack Load Test*— The samples shall be selected in accordance with **8.3** and shall be filled with equivalent mass of contents before the test. The filled boxes shall be stacked to a height of 2 m and for a period of 24 hours. The test shall be carried out in as prescribed in IS : 7028 (Part I)-1973†.

7.2 The boxes after each individual test shall not show any evidence of cracking of serious rupture.

8. SAMPLING

8.1 For inspection of dimensions, the number of samples to be drawn for various lot sizes shall be as prescribed in Table 1.

**TABLE 1 SAMPLE SIZE AND CRITERIA FOR CONFORMITY
FOR DIMENSIONAL INSPECTION**

LOT SIZE (1)	SAMPLE SIZE (2)	ACCEPTANCE NO. (3)
Up to 300	8	1
301 „ 500	13	1
501 „ 1 000	20	2
1 001 „ 3 000	32	3
3 001 and above	50	5

*Performance test for complete, filled transport packages : Part IV Vertical impact drop test.

†Performance test for complete, filled transport packages : Part I Stack load test.

3.2 For drop test the number of boxes to be selected shall be two if the lot size is less than 1 000 boxes and three otherwise.

3.3 For stack load test adequate number of boxes shall be selected so that two stacks each of 2 m height can be made for lot sizes of less than 1 000 boxes and three stacks otherwise.

3.4 In case of dimensions, the lot shall be accepted if the number of failures of boxes does not exceed the number given in col 3 of Table 1. In case of performance testing no box shall show any evidence of failure as given in 7.2.

9. MARKING

9.1 The boxes shall be marked at a suitable place with the name or trade-mark of the fabricator.

9.2 The boxes may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements for that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers, or processors, may be obtained from the Indian Standards Institution.

APPENDIX A

(Clause 4.2)

TIMBER SPECIES SUITABLE FOR NON-RETURNABLE WOODEN
BOXES FOR HORTICULTURE PRODUCE

SL No.	BOTANICAL NAME	TRADE NAME
1.	<i>Abies pindrow</i> Spach.	Fir
2.	<i>Ailanthus</i> sp.	Gokul
3.	<i>Ailanthus excelsa</i> Roxb.	Maharukh
4.	<i>Albizia lebbek</i> Benth.	Siris
5.	<i>Alstonia scholaris</i> R. Br.	Chatian
6.	<i>Anthocephalus cadamba</i> Mig.	Kadam
7.	<i>Antiaris toxicaria</i> Leschen	Upas
8.	<i>Canarium strictum</i> Roxb.	White dhup
9.	<i>Cedrela toona</i> Roxb.	Toon
10.	<i>Duabanga sonneratioides</i> Ham.	Lampati
11.	<i>Elaeocarpus tuberculatus</i> Roxb.	Rudrak
12.	<i>Endospermum</i> sp.	Bakota
13.	<i>Ficus</i> sp.	Fig
14.	<i>Lophopetalum wightiamum</i> Arn.	Banati
15.	<i>Picea smithaiana</i> Boiss.	Spruce
16.	<i>Pinus roxburgii</i> Sargent.	Chir
17.	<i>Populus</i> sp.	Poplar
18.	<i>Salmalia malabarica</i> Schott & Endle	Semul
19.	<i>Sapium baccatum</i> Roxb.	Seleng
20.	<i>Trewia nudiflora</i> Linn.	Gutel