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मानक

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Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7698 (1983): returnable wooden crates for vegetables  
[CED 9: Timber and Timber Stores]



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Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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IS : 7698 - 1983

*Indian Standard*  
SPECIFICATION FOR  
RETURNABLE WOODEN CRATES  
FOR VEGETABLES  
( *First Revision* )

UDC 621.798.12 : 674.61 : 635.1/8



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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

*Indian Standard*  
 SPECIFICATION FOR  
 RETURNABLE WOODEN CRATES  
 FOR VEGETABLES  
 ( *First Revision* )

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*Indian Standard*  
SPECIFICATION FOR  
RETURNABLE WOODEN CRATES  
FOR VEGETABLES  
( *First Revision* )

**0. FOREWORD**

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 30 August 1983, 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** As a complementary effort to the grow more food campaign, conservation, of food products assume great importance. The Wood and Wood Products Containers Sectional Committee envisaged that a separate Indian Standard on crates for vegetables, like cabbage, spring greens, etc, would go a long way in the conservation of these essential food materials from spoilage.

**0.3** In selecting dimensions for boxes, consideration has been given to the growing use of pallets for materials handling for through transit specified in IS : 4300-1967\*. The nominal and external base dimensions are 500 × 300 mm, which would provide a pressure food on the 1 000 × 1 200 mm pallets, allowing for bowing of the filled boxes and facilitating placement of the boxes on the pallets.

**0.4** This standard was first published in 1975. It has been revised to up-date it with the latest information available. In the revised version, the major changes include incorporation of an additional clause on terminology, increase in moisture content of wood used in the construction of crates from 15 to 18 percent, and inclusion of a limit for contents in the box. The number of crates to be examined for different lot size has also been modified.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, final value, observed or calculated,

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\*Specification for box pallets for through transit of goods.

expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## 1. SCOPE

**1.1** This standard specifies the dimensions, materials and constructional requirements and the methods of sampling and test for vegetable crates for use on a returnable basis.

## 2. TERMINOLOGY

**2.0** For the purpose of this standard, the following definitions, in addition to those given in IS : 707-1976† and IS : 6703-1972‡ shall apply.

### 2.1 Objectionable Knots

**2.1.1** A live knot shall be considered objectionable if its diameter along the major axis exceeds 50 percent of the width of a board or batten, subject to a maximum of 75 mm, provided such knots are not more than one for a length of 20 cm of boards or battens or are situated within 25 mm from a place through which a nail will be driven, either in the shook or when the case is assembled.

**2.1.2** A dead knot shall be considered objectionable if its diameter along the major axis exceeds 6 mm in the case of an unplugged knot or 25 mm in the case of a glued and plugged knot, provided such knots are not more than one for a length of 20 cm of the boards or battens or are situated within 25 mm from a place through which a nail will be driven, either in the shook or when the case is assembled.

## 3. DIMENSIONS

**3.1 Crates** -- The maximum, overall dimensions of the crate shall be as follows, subject to the tolerances given in 3.3 :

Length	500 mm
Width	300 mm
Depth	350 mm

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\*Rules for rounding off numerical values (*revised*).

†Glossary of terms applicable to timber technology and utilization.

‡Glossary of wooden packaging terms.



**3.2 Wooden Components** — The maximum dimensions of wooden components of the crate shell be in accordance with Table 1 subject to the tolerances given in 3.3.

**TABLE 1 DIMENSIONS OF COMPONENTS**

SL No.	COMPONENT	NUMBER OF PIECES REQUIRED FOR MAKING	DIMENSIONS
(1)	(2)	(3)	(4)
			mm × mm × mm
i)	End boards	6	300 × 75 × 6
ii)	Side boards	6	500 × 75 × 6
iii)	Bottom boards	4	500 × 75 × 10
iv)	Interior corner posts	2 (to be made into 4 parts of $\Delta$ cross section)	350 × 50 × 50

NOTE — The dimensions in this table are actual dimensions after allowing for sawing allowances.

**3.3 Tolerance** — The dimensions specified in 3.1 and 3.2 shall be subject to the tolerances given below:

	<i>Tolerance</i> mm
Internal dimensions	±3
Thickness	±1
Width of boards	±2
Length of boards and corner posts	±3

**3.4** If specified by the purchaser, additional battens may be provided internally on bottom and sides.

## 4. MATERIALS

**4.1 Timber** — Timber used in the construction of the crate shall be of any of the species given under group II and III of Appendix A of IS : 6662-1980\*.

**4.1.1** The timber shall be seasoned to a moisture content not exceeding 18 percent and the inclination of the grain shall not exceed 1 in 10. The timber shall be free from centre heart (pith), insect attack, any kind of decay (rot), objectionable knots, warping, splits and any other defects which will reduce the strength or usefulness of the crate.

\*Specification for timber species suitable for wooden packaging (*first revision*).

Pin holes ( dead infestation ) shall be permissible provided they are not of powder post beetles and are scattered ( non-concentrated ).

4.1.2 Any other suitable timber not included in group II and III of Appendix A of IS : 6662-1980\* may be used with the prior approval, in writing, of the purchaser.

4.1.3 As far as possible, only one species of timber should be used in the manufacture of any one crate. However, where different species are required to be used, the species shall be selected from the same group. In no circumstances for any one crate different species of different groups shall be employed.

4.1.4 Plywood of thickness  $4.0 \pm 0.2$  mm conforming to CWR grade of IS : 303-1975† may also be used for sides and ends.

## 5. CONSTRUCTION

5.1 The bottom, side and end boards shall be fixed to corner posts as illustrated in Fig. 1. Nailing shall be in accordance with Table 2.

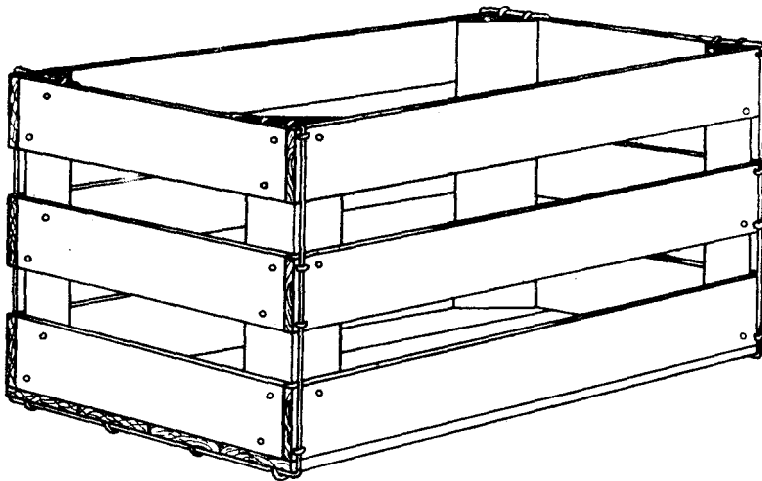


FIG. 1 VEGETABLE CRATE

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\*Specification for timber species suitable for wooden packasing ( *first revision* ).

†Specification for plywood for general purposes ( *second revision* ).

**TABLE 2 NAILING**  
( Clause 5.1 )

SL No.	COMPONENTS BEING ASSEMBLED	NAILS			
		Number of Each Joint	Total Number	Length mm	Gauge mm
(1)	(2)	(3)	(4)	(5)	(6)
i)	Side boards to posts	1	12	30	2.0
ii)	Side boards to end	1	12	30	2.0
iii)	Bottom boards to end	2	16	30	2.0
iv)	End boards to posts	2	24	30	2.0
v)	Side boards to bottom	6	12	30	2.0

**5.2 Nails** — Nails used in the manufacturers of boxes shall be of the clout headed type ( see IS : 723-1972\* ).

**5.3** If the additional battens mentioned in 3.4 are provided, bright nails of 25 mm length and 1.8 mm gauge shall be used as required and they shall be clinched along the grain.

**5.4** The ends of the crate shall be wired with 3 mm galvanized or other rust-resistant crescent wire. The ends of the crescent wire shall be turned in on the top of the end of the box about 50 mm from the side. The wire shall be affixed by stapling with suitable size of staples. At each end of the box there shall be 4 staples on each side and on the bottom, and 4 staples on the top.

**5.5** The crates shall be provided with a suitable lid or cover and a lining inside in order to protect the contents from pilferage without adversely affecting the airing of the contents as agreed to between the purchaser and the supplier.

**5.6** The mass of the contents and the box shall not exceed 20 kg.

## 6. PERFORMANCE TEST

**6.1 Dragging Test** — When the crates ready for use are tested in accordance with the test method prescribed under Appendix A, they shall not show any evidence of damage which may spoil the contents intended to be packed.

**6.2 Drop Test** — When the crates ready for use are tested in accordance with the test method prescribed under Appendix B, they shall not show any evidence of damage which may spoil the contents intended to be packed.

\*Specification for steel countersunk head wire nails ( first revision ).

## 7. SAMPLING

**7.1** Unless otherwise agreed to between the purchaser and the supplier, the procedure given in 7.2 to 7.5 shall be followed for sampling of the crates.

**7.2 Lot** — The number of crates produced under the same conditions shall constitute a lot.

**7.2.1** For ascertaining the conformity of the lot to the requirements of this standard, crates shall be examined from each lot and shall be drawn at random. To ensure randomness of selection, IS : 4905-1968\* may be followed.

**7.3** The number of crates to be examined for material defects ( see 4 ) dimensions ( see 3 ) and constructional requirements ( see 5 ) shall be according to col 1 and 2 of Table 3.

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**TABLE 3 SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY**

LOT SIZE	SAMPLE SIZE	PERMISSIBLE NUMBER OF DEFECTIVE SAMPLES
(1)	(2)	(3)
Up to 300	10	1
301 to 500	15	2
501 to 1 000	20	3

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**7.4** For each performance test ( see 6 ) 20 samples shall be drawn from a lot size of 1 000 or part thereof.

**7.5 Criteria for Conformity** — The lot shall be considered in conformity with the requirements of this standard if the conditions given below are satisfied:

- a) The number of crates found defective for any one or more of the characteristics given under 7.3, does not exceed the corresponding number given in col 3 of Table 3; and
- b) Not more than one crate fails to satisfy the requirements for each performance test.

## 8. MARKING

**8.1** The crates shall be marked on the central board of the ends with the following details:

- a) Name and trade-mark of the fabricators; and
- b) Date of fabrication.

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\*Methods for random sampling.

### 8.1.1 The crates 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 of 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.

## A P P E N D I X A

( Clause 6.1 )

### DRAGGING TEST

**A-1.** The crate shall be filled to its nominal capacity by vegetables or any other equivalent materials simulating the mass and nature of the specified contents, and all wiring, stapling, etc, shall be done in the same manner as for regular transit. The crate shall then be placed on a level concrete surface or smooth rod and dragged horizontally to 6 metre distance from its initial position. The crate if closed shall then be turned by 90° on the same axis and will be dragged back to its initial position. The above cycle shall be repeated 10 times and immediately after completion of the above test, the crate shall be examined for any visible damage.

## A P P E N D I X B

( Clause 6.2 )

### DROP TEST

**B-1.** The crate shall be filled to its nominal capacity by vegetables or any other equivalent material simulating the mass and nature of the specified contents, and all wiring, stapling, etc, shall be done in the same manner as for regular transit. The crate shall then be dropped twice from a constant height of 1 metre on a level concrete surface. Immediately after completion of the above test, the crate shall be examined for any visible failure.

( Continued from page 2 )

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# INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

## Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

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