भारतीय मानक

Indian Standard

IS 7698 : 2023

सब्ज़ियों के लिए वापसी योग्य लकड़ी के टोकरे — विशिष्टि

(दूसरा पुनरीक्षण)

Returnable Wooden Crates for Vegetables — Specification

(Second Revision)

ICS 55.160

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

December 2023 **Price Group 5**

Timber and Timber Stores Sectional Committee, CED 09

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Timber and Timber Stores Sectional Committee had been approved by the Civil Engineering Division Council.

As a complementary effort to grow more food campaign, the conservation of food products assume great importance. This Indian Standard on crates for vegetables, like cabbage, spring greens, etc was first published in 1975 and then revised in 1983.

In this revision, the following changes have been incorporated;

a) Raw material grade has been revised as per change in the respective standard;
b) Marking clause has been updated;
c) Sampling clause has been updated;
d) BIS certification marking clause has been updated;
e) References to various Indian Standards have been updated; and
f) Additional requirement of ECO-Mark has been added.

A scheme of labelling environment friendly products known as ECO-Mark has been instituted at the instance of the Ministry of Environment, Forests and Climate Change, Government of India. The ECO-Mark is administered by the Bureau of Indian Standards (BIS) under the *Bureau of Indian Standards Act*, 2016 as per the Resolution No. 71 dated 21 February 1991 and Resolution No. 425 dated 20 October 1992 published in the Gazette of the Government of India. For a product to be eligible for ECO-Mark, it shall also carry the Standard Mark (ISI Mark) of BIS besides meeting additional environment friendly requirements. For this purpose, the Standard Mark of BIS would be a single mark being a combination of the ISI Mark and the ECO-Mark. Requirements to be satisfied for a product to qualify for the BIS Standard Mark for eco-friendliness will be optional. Manufacturing units will be free to opt for ISI Mark alone also.

The ECO criteria is based on the Gazette Notification No. 170 dated 16 May 1996 for wood substitutes as environment friendly products published in the Gazette of Government of India, as revised/amended from time to time.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

This standard contributes to the Untied Nations Sustainable Development Goal 9 ‘Industry, innovation and infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation’.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

RETURNABLE WOODEN CRATES FOR VEGETABLES — SPECIFICATION

(Second Revision)

1 SCOPE

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 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 303 : 1989	Plywood for general purposes — Specification (*third revision*)
IS 707 : 2011	Timber technology and utilization of wood, bamboo and cane — Glossary of terms (*third revision*)
IS 723 : 1972	Specification for steel countersunk head wire nails (*first revision*)
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
IS 6662 : 1993	Timber species suitable for wooden packaging — Specification (*second revision*)
IS 6703 : 1972	Glossary of wooden packaging terms

3 TERMINOLOGY

For the purpose of this standard, the following definitions, in addition to those given in IS 707 and IS 6703 shall apply.

3.1 Objectionable Knots

3.1.1 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 200 mm 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.

3.1.2 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 200 mm 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.

4 DIMENSIONS

4.1 Crates

The maximum, overall dimensions of the crate shall be as follows, subject to the tolerances given in **4.3**:

Length	500 mm
Width	300 mm
Depth	350 mm

4.2 Wooden Components

The maximum dimensions of wooden components of the crate shall be in accordance with Table 1 subject to the tolerances given in **4.3**.

Table 1 Dimensions of Components

(*Clause* 4.2)

Sl No.	Component	Number of Pieces Required for Making	Dimensions mm × mm × mm
(1)	(2)	(3)	(4)
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 a cross section)	350 × 50 × 50

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

4.3 The dimensions specified in **4.1** and **4.2** shall be subject to the tolerances given below:

Sl No.	*Dimensions*	*Tolerances* mm
(1)	(2)	(3)
i)	Internal dimensions	± 3
ii)	Thickness	± 1
iii)	Width of boards	± 2
iv)	Length of boards and corner posts	± 3

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

5 MATERIALS

5.1 Timber

Timber used in the construction of the crate shall be of any of the species given under Group II and III of Annex A of IS 6662.

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

5.1.2 Any other suitable timber not included in Group II and III of Annex A of IS 6662 may be used as agreed to between the manufacturer and the purchaser.

5.1.3 For ECO-Mark, only suitable species of wood from sources other than natural forests such as social forestry plantations etc shall be used subject to prior agreement for the species between the purchaser and the supplier.

5.1.4 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.

5.1.5 Plywood of nominal thickness 4.0 mm conforming to BWR grade of IS 303 may also be used for sides and ends.

6 CONSTRUCTION

6.1 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.

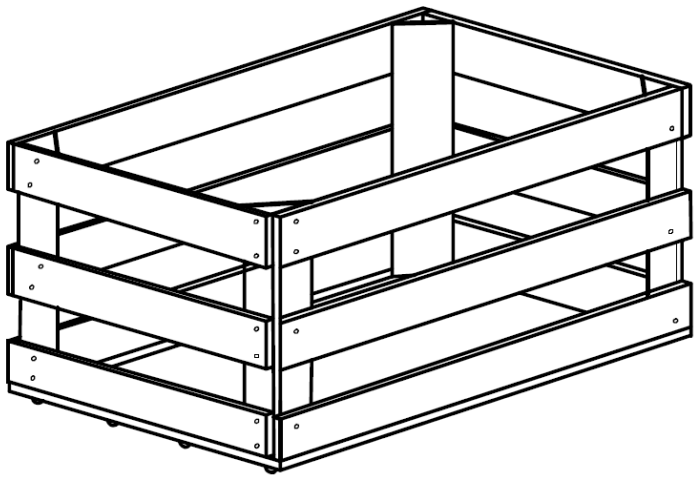

FIG. 1 VEGETABLE CRATE

Table 2 Nailing

(*Clause* 6.1)

Sl No.	Components Being Assembled	Nails			
		Number of Nails at 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

6.2 Nails

Nails used in the manufacturers of boxes shall be of the clout headed type (*see* IS 723).

6.3 If the additional battens mentioned in **4.4** 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.

6.4 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.

6.5 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.

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

7 PERFORMANCE TEST

7.1 Dragging Test

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

7.2 Drop Test

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

8 SAMPLING

8.1 Unless otherwise agreed to between the purchaser and the supplier, the procedure given in **8.2** to **8.5** shall be followed for sampling of the crates.

8.2 Lot

The number of crates produced from the same group of timber under the same conditions shall constitute a lot.

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 may be followed.

8.3 The number of crates to be examined for material defects (*see* **5**), dimensions (*see* **4**) and constructional requirements (*see* **6**) shall be according to col (2) and col (3) of Table 3.

8.4 For each performance test (*see* **7**) 20 samples shall be drawn from a lot size of 1 000 or part thereof.

Table 3 Scale of Sampling and Criteria for Conformity

(*Clauses* 8.3 *and* 8.5)

Sl No.	Lot Size	Sample Size	Permissible Number of Defective Samples
(1)	(2)	(3)	(4)
i)	Up to 300	10	1
ii)	301 to 500	15	2
iii)	501 to 1 000	20	3
iv)	1 001 and above	25	4

8.5 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 **8.3**, shall not exceed the corresponding number given in col (4) of Table 3; and

b) Not more than one crate fails to satisfy the requirements for each performance test.

9 ADDITIONAL REQUIREMENTS FOR ECO-MARK

9.1 General Requirement

9.1.1 Crates shall conform to the requirement specified in this standard.

9.1.2 The manufacturer shall produce to BIS, the environmental consent clearance from State Pollution Control Board as per the provisions of the *Water* (*Prevention and Control of Pollution*) *Act*, 1974 and *Air* (*Prevention and Control of Pollution*) *Act*, 1981, *Water* (*Prevention and Control of Pollution*) *Act*, 1981 and *Water* (*Prevention and Control or Pollution*) *Cess Act*, 1977 along with the authorization, if required under the *Environment* (*Protection*) *Act*, 1986, while applying for ECO-Mark appropriate with enforced Rules and Regulations of Forest Department.

9.2 Specific Requirement

Crates shall conform to the specific requirements given for ECO-Mark under relevant clauses of this standard.

NOTE — The manufacturer shall provide documentary evidence by way of certificate or declaration to Bureau of Indian Standards, while applying for ECO-Mark.

10 MARKING

10.1 The crates shall be legibly and indelibly marked on the central board of the ends with the following details:

a) Name and Trade-mark of the fabricators;
b) Capacity of crates in kg;
c) Species of timber;
d) Batch No./Lot No.;
e) Date of fabrication; and
f) Criteria for which the crate has been labelled as ECO-Mark.

10.2 BIS Certification Marking

The product(s) may be marked with Standard Mark as per the conformity assessment schemes governed by the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations made thereunder. The details of conditions for the license may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 7.1)

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 a 6 m distance from its initial position. The crate if closed shall then be turned by 90º 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.

ANNEX B

(*Clause* 7.2)

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 m on a level concrete surface. Immediately after completion of the above test, the crate shall be examined for any visible failure.

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Timber and Timber Stores Sectional Committee, CED 09

Organization	*Representative(s)*
Forest Research Institute, Dehradun	DR RENU SINGH **(*Chairperson*)**
Bamboo Society of India, Bengaluru	SHRI V. P. HIREMATH SHRI U. T. ALVA (*Alternate*)
Central Public Works Department, New Delhi	CHIEF ENGINEER (CSQ) SUPERINTENDENT ENGINEER (TAS) (*Alternate*)
Chhattisgarh Rajya Van Vikas Nigam Limited, Raipur	SHRI R. K. SHARMA SHRI B. K. SINHA (*Alternate*)
CSIR - Central Building Research Institute, Roorkee	SHRI MICKY M. DELBEHRA DR BANTI GEDAM (*Alternate*)
Directorate of Standardization, Ministry of Defence, Dte. of Standardization Government, New Delhi	DR K. C. GUPTA SHRI JITENDRA KUMAR (*Alternate*)
Federation of Indian Plywood and Panel Industry, New Delhi	SHRI AJAY BALDAWA
Forest Research Institute, Dehradun	REPRESENTATIVE
Himachal Pradesh Forest Corporation Limited, Shimla	MANAGING DIRECTOR EXECUTIVE DIRECTOR (*Alternate*)
Indian Council of Forestry Research and Education, Dehradun	DIRECTOR GENERAL
Indian Plywood Industries Research and Training Institute, Bengaluru	SHRI UDAY D. NAGAMMANAVAR DR NARSIMHAMURTHY (*Alternate*)
Institute of Wood Science and Technology, Bengaluru	DR M. P. SINGH DR S. R. SHUKLA (*Alternate* I) SHRI VEER SINGH GAUTAM (*Alternate* II)
Karnataka State Forest Industries Corporation Limited, Bengaluru	MANAGING DIRECTOR
Kerala Forest Research Institute, Thrissur	DR SREEKUMAR V. B. DR SHWETA B. KUKRETI (*Alternate*)
Madhya Pradesh Rajya Van Vikas Nigam Limited, Bhopal	SHRI A. K. PATIL
Mazagon Dock Limited, Mumbai	SHRI P. DHANRAJ SHRI KIRAN PRALHAD RAJPUT (*Alternate* I) SHRI GOURAV KUMAR (*Alternate* II)
Military Engineer Services, Engineer-in-Chief's Branch, Integrated HQ of MoD (Army), New Delhi	SHRIMATI RIVOO MAHENDRU SHRI S. K. MISHRA (*Alternate*)

Organization	*Representative(s)*
Ministry of Environment Forest and Climate Change, New Delhi	DR SUNEESH BUXY SHRI SANJAY KUMAR CHAUHAN (*Alternate*)
Naval Dockyard, Mumbai	SHRI PRABHAKAR GANPAT MIRASHI SHRI ARAVIND YASHAWANT MHATRE (*Alternate*)
North East Cane and Bamboo Development Council, Guwahati	DR SHAILENDRA CHAUDHARI
Rubber Research Institute of India, Rubber Board, Kottayam	SHRI P. ARUMUGAM SHRI UMASANKAR G. (*Alternate*)
Wood Technology Association, Yamuna Nagar	SHRI S. C. JOLLY SHRI MANOJ GWARI (*Alternate*)
In Personal Capacity (*606 B, I Block, III Stage UVCE Layout, WOC Road, Basaveshwaranagar, Bengaluru*)	SHRI T. K. DAMODARAN
In Personal Capacity (*Hasiru Bhavana, Doresanipalya Forest Campus, Vinayakanagar Circle, J.P. Nagar, 5th Phase, Bengaluru*	DR O. K. REMADEVI
BIS Directorate General	SHRI ARUN KUMAR S., SCIENTIST 'E'/DIRECTOR AND HEAD (CIVIL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI PRADEEP SINGH SHEKHAWAT
SCIENTIST 'D'/JOINT DIRECTOR
(CIVIL ENGINEERING), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: CED 09 (21642).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. CHANDIGARH. CHENNAI. COIMBATORE. DEHRADUN. DELHI. FARIDABAD. GHAZIABAD. GUWAHATI. HIMACHAL PRADESH. HUBLI. HYDERABAD. JAIPUR. JAMMU & KASHMIR. JAMSHEDPUR. KOCHI. KOLKATA. LUCKNOW. MADURAI. MUMBAI. NAGPUR. NOIDA. PANIPAT. PATNA. PUNE. RAIPUR. RAJKOT. SURAT. VISAKHAPATNAM.

Published by BIS, New Delhi