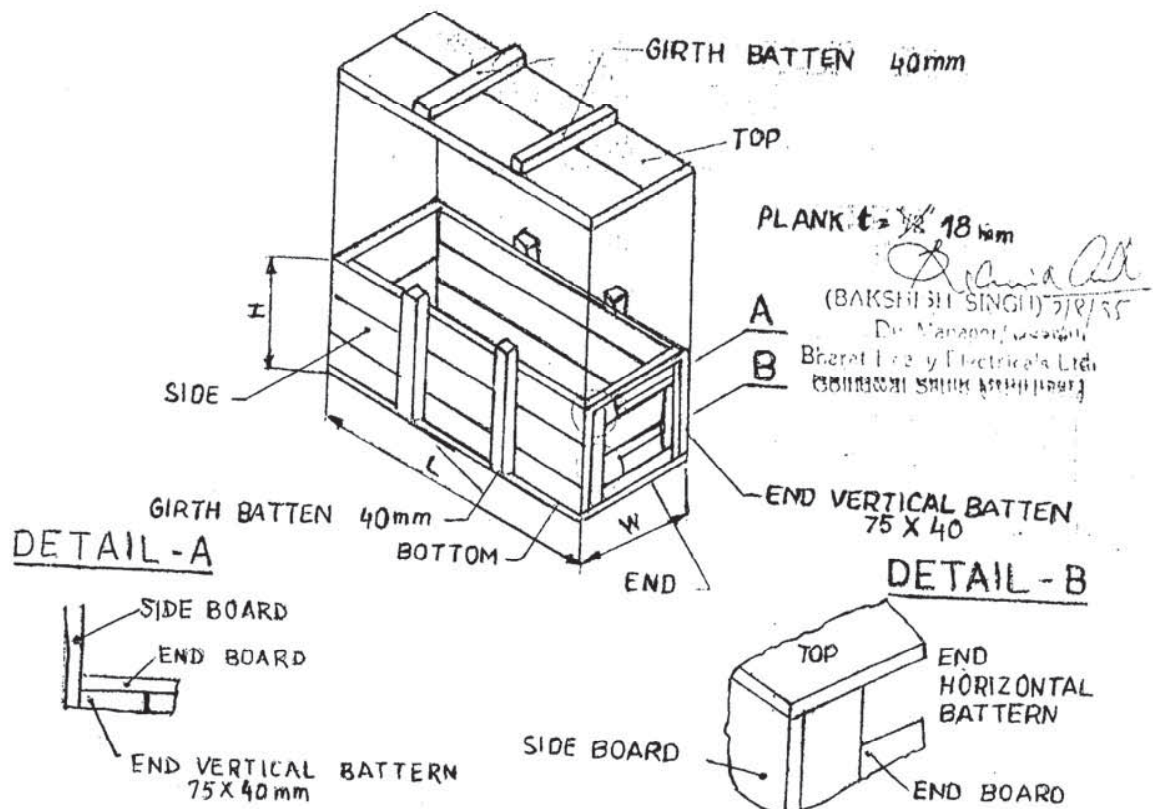




Box Type No 2A is added.
 24/8/2002

NOTES:-

1. ALL DIMENSIONS ARE IN mm.
2. L, W, H ARE INNER DIMENSIONS OF THE BOX.

TYPE NO				
	L	W	H	
1A	320	250	260	
1	320	250	430	
2	430	370	430	
2A	500	450	550	

	BHEL –IVP-Goindwal Quality Department Technical Delivery Conditions	DOC NO TDC:WOODENBOX: Rev:06 Rev date: 18.08.2018
Product: : Assembled Wooden boxes and loose wooden planks		

1. General:

This TDC lays down instructions for supply of assembled wooden boxes and loose wooden planks at industrial valves plant for transportation of the valves/wall blowers/Loose Components & other finished products.

2. Wood Species:

The following wood species can be used for Wooden boxes/planks:

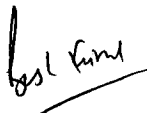
Coniferous Wood:

Trade Name	Botanical Name
Fir	Abies pindrow
Deodar	Cedrus deodara
Chir	Pinus roxburghil
Kali	Pinus wallichians
Khasi Pine	Pinus khasya
Spruce	Picea smithiana boiss

Non Coniferous Wood:

Trade Name	Botanical Name
Rubber wood	Hevea brasiliensis
Salai	Boswellia serrata
Bahera	Terminalia bellirica
Jaman	Syzygium cumini
Lendi	Lagerstroemia parviflora
Mango	Hangifera indica
Machilus(Kalamavu)	Machilus macrantha
Irul	Xylis xylocarpa
Irulbaken	Hopes
Karumarudu	Terminalia tomentosa
Murtenga	Bursera serrata
Nangal	Mesua ferrea
Pillamarudu	Terminalia paniculata
Sal	Shorea Robusta

Any other species of wood as per Groups I, II of IS 6662 will also be accepted.

	BHEL –IVP-Goindwal Quality Department Technical Delivery Conditions	DOC NO TDC:WOODENBOX: Rev:06 Rev date: 18.08.2018
Product: : Assembled Wooden boxes and loose wooden planks		

3. Compliance With Standards:

Assistance has been derived from the following standards in the preparation of this specification.

BHEL Corporate Packing Standard No.. : AA 51402 for non-coniferous wood

BHEL Corporate Packing Standard No.. : AA 51401 for coniferous wood

IS 1326-1992: Non-Coniferous Sawn Timber (Baulks & Scantling)

IS 5966-1993: Non-Coniferous Timber in Converted Form for General Purposes

IS: 190 – 1991 Grade I:Coniferous Sawn Timber (Baulks & Scantling)

IS: 6662 – 1993 : Timber Species Suitable For Wooden Packaging Groups I & II

4. Requirements:

- 4.1 Wooden boxes shall be duly provided with a 70 GSM (Colourless/Transparent) Multi Layered Cross Laminated Polythene Film Specification No: AA51420 on inner surface of four sides of box & inner surface of top cover using blue nails to protect the valves from outside rain water or condensing moisture. The length of blue nails shall be 16mm.
- 4.2 Wherever 2 pieces of Cross laminated poly film are used, the joint shall have an overlap of minimum 20 mm. The film used for top cover shall project outside on 4 sides by at least 100 mm and shall be nailed properly on sides. The film is not required for the base of the boxes.
- 4.3 Corner plates and sling plates made of mild steel sheet measuring as per drawing shall be used.
- 4.4 Two consecutive planks shall be joined by lap joint as per drawing.
- 4.5 The dia. of the nails shall be 3.15mm. The length of the nails shall be 65mm wherever two planks of 25mm thickness are joined and 85mm wherever a 25mm planks is joined to a 50mm plank. The extra length of nail after nailing in both planks shall be bend properly. Nailing should be done in such a way that head of nail shall be outside the box. Distance between any two nails shall not be more than 100mm.

5. Dimensions and Tolerances:

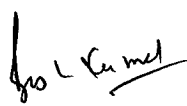
Width, thickness and length of all components of wood used in wooden boxes shall be as specified in drawing/Purchase Order. Dimensional tolerances shall be as follows:

Width: +/- 5mm

Thickness : +2/-1 mm (for thickness less than 20 mm)

+3/-1 mm (for thickness $\geq$ 20 mm)

Length: +/- 2% of total length or 25 mm whichever is lower.



Page 2 of 5

	BHEL –IVP-Goindwal Quality Department Technical Delivery Conditions	DOC NO TDC:WOODENBOX: Rev:06 Rev date: 18.08.2018
Product: : Assembled Wooden boxes and loose wooden planks		

6. Moisture Content:

The timber shall have moisture content as stated below within a depth of 15mm from the surface excluding a length of 300 mm from each end at the time of inspection. The moisture content will be determined in accordance with IS: 287

October to June : 30%
July to September (Rainy season) : 40%.

7. Permissible Defects:

- 7.1 Brashness, splits across the grains, shakes, cups, twist, insect attack, centre heart in planks are the defects which are not acceptable.
- 7.2 **Bow:** Shall be permissible upto a maximum of 2mm for 300mm
- 7.3 **End Splits:** The largest end splits at each end shall be measured and the length added together. The added lengths of these shall not exceed 60 mm per meter run of the piece.
- 7.4 **Live / Dead Knots:** A maximum of 5 Knots/m length are permissible; however, the knots shall not be so grouped or located as to affect the strength of the piece. Knots above 35mm. diameter are not permissible. Major axis of the knot shall be taken as the diameter of this knot.
- 7.5 **Surface Cracks:** Surface cracks with a depth of 10% subjected to maximum of 10 mm are permissible. A continuous crack of any depth all along the length is not permissible.

8. Certificate:

The supplier shall furnish a certificate with each lot/consignment in support of the species of the wood, moisture content, size of the nails used, GSM of polythene used, dimension report of one piece per type per lot and any special information which the tenderer feel is essential for the quality of the packing boxes.

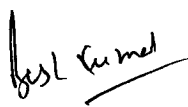
9. Identification and Marking:

The boxes shall be marked/painted in order to identify the source of supply on one of two small side faces.

- SUPPLIER NAME:
- BOX TYPE:
- BOX SERIAL NO.:
- SUPPLIER INVOICE NO.:

Following marking has to be done using paint/ink & stencil on one long side face-

- CONSIGNEE :
- INVOICE NO.:
- OA NO./WO. NO.:



BHEL –IVP-Goindwal
Quality Department
Technical Delivery Conditions

DOC NO TDC:WOODENBOX:
Rev:06
Rev date: 18.08.2018

Product: : Assembled Wooden boxes and loose wooden planks

- CASE NO.:
- MATERIAL/QTY:
- WEIGHT:
- FROM :BHEL/GOINDWAL/TARN TARAN

The ink shall be non-fading/indelible and non-washable by water.

Loose planks supplied by supplier as per PO shall be done colour coding on one end as per colour allotted to supplier.

10. Inspection: Supplier shall submit inspection report as per below format for one box of each type per lot of supply:

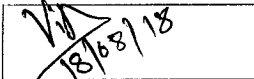
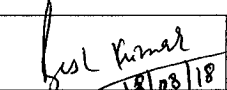
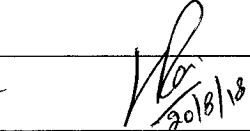
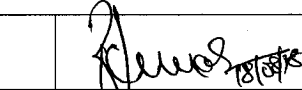
Inspection Format for wooden boxes and planks:									
Date of inspection:					Box inspection format no: Wooden box insp:001				
Supplier name									
Supplied batch details									
Observed dimensions									
Box type	L	W	H	C	D	Dimension	LENGTH	width	Thickness
						Plank			
						Resting Beam			
						others			
SN	Type of check		Remarks						
1	Polythene film								
2	Corner and sling plates								
3	Planks overlapping								
4	Moisture content								
5	Size of nails used								
6	Defect details (If found above permissible limit as per clause No. 7)								
7	Identification and Marking								
8	Other remarks(If any)								

	BHEL –IVP-Goindwal Quality Department Technical Delivery Conditions	DOC NO TDC:WOODENBOX: Rev:06 Rev date: 18.08.2018
Product: : Assembled Wooden boxes and loose wooden planks		

11. AUDIT CHECKS AT BHEL:

BHEL reserves the right to carry out audit checks for wood species, polythene film confirmation to standard, nails size, Corner & Sling plate material & dimension, planks & overall box dimensions. Items found defective during check at BHEL will be rejected.

 18/08/18	 18/08/18	 20/8/18	 18/08/18	 20/8/18
Vikas Kumar	Rajesh Kumar	Harpreet Rai	Rakesh Kumar	S R Kenny
Sr. Engr/QM	Dy Mgr/CML	Sr DGM/CML	Sr DGM/MM	AGM/QM &HSE
Prepared by		Reviewed by		Approved by



CORPORATE PURCHASING SPECIFICATION

AA51401

Rev No. 03

PAGE 1 of 6

CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSES

1.0 GENERAL:

This specification governs the quality requirements of Coniferous timber supplied in the form of planks, battens beams and sleepers. The coniferous timber differs from non-coniferous (broad leave) timber in its gross appearance, anatomical structure and properties. In general, it works more easily under the tools and can be easily nailed.

2.0 APPLICATION:

Used for general packing purposes.

3.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no National standard covering this material. However, assistance has been derived from the following National standards:

IS: 190 – 1991 Grade I : Coniferous Sawn Timber (Baulks & Scantling)

IS: 6662 – 1993
Groups III & IV : Timber Species Suitable For Wooden Packaging

4.0 TERMINOLOGY:

For the purpose of this specification, the definitions given in IS: 707 (Glossary of terms applicable to timber and timber products) shall apply except for the beam which is defined as follows:

Beam is defined as converted timber whose cross-sectional dimensions exceed 50mm in both directions.

5.0 SPECIES:

Shall be as stated on the order. Some standard species are:

<u>Trade Name</u>	<u>Botanical Name</u>	<u>Abbreviation</u>
Fir	Abies pindrow	FIR
Deodar	Cedrus deodara	DEO
Chir	Pinus roxburghil	CHR
Kali	Pinus wallichians	KAL
Khasi Pine	Pinus khasya	KPI
Spruce	Picea smithiana boiss	SPR

Revisions:

Cl. 6.2.2 of MOM of WG – (T&PM)

APPROVED:INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(T&PM)

Rev No.03

Amd No.01

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt:01-10-1995

Dt:02-05-2002

Year:2018

HEP, Bhopal

Corp.R&D

MAR. '80

CORPORATE PURCHASING SPECIFICATION



6.0 DIMENSIONS AND TOLERANCES:

6.1 Sizes:

Width, thickness and length of timber shall be clearly stated on the order.

6.2 Tolerances:

6.2.1 Width : 50 to 250 mm Tolerance : +3 mm

6.2.2 Thickness: 20 to 250 mm Tolerance: +3 mm
- 1 mm

6.2.3 Length:

Standard length : 1 to 12 metres in multiples of 0.5 metre
Tolerance : $\pm 2\%$ or ± 25 mm whichever is less.

Note:

1.0 Measurements:

1.1 When nominal sizes are ordered, length, width and thickness shall be measured on the basis of accepted sizes. Plus tolerances shall not be added while computing the volume.

1.2 The measurements of length, width, thickness and computation of volume shall be as follows:

- a) The length shall be measured in metres in midline of a piece. The fractions of a metre shall be rounded off to the nearest lower 10 mm.
- b) The width shall be measured at the narrowest place in millimetres and shall be rounded off to the nearest lower one millimetre.
- c) The thickness shall be measured at the narrowest place in millimeters and shall be rounded off to the nearest lower one millimeter.
- d) The volume shall be computed in cubic meters correct to three places of decimal on the basis of accepted sizes

2.0 Single sampling plan based on IS: 2500 shall be followed.

7.0 MOISTURE CONTENT:

The timber shall have moisture content as stated below within a depth of 15mm from the surface excluding a length of 300mm from each end at the time of inspection. The moisture content will be determined in accordance with IS: 287

October to June : 30%

July to September (Rainy season): 40%



CORPORATE PURCHASING SPECIFICATION

AA51401

Rev No.03

PAGE 3 of 6

8.0 FREE FROM DEFECTS:

Timber shall be free from the following defects:

Brashness, splits across the grain, shakes, spring, twist, insect attack, any kind of decay (rot), any sign of Infection, open centre heart, centres heart on planks and any other defect.

Defects to the extent specified below are permissible. These defects shall be measured in accordance with IS: 3364.

8.1 Bow:

Shall be permissible up to a maximum of 2 mm for 300 mm length.

8.2 Cud:

Shall be permissible up to a maximum of 6 mm for 300 mm width

8.3 Centre heart:

Shall be permissible only on sleepers when it is not further than 35 mm from the nearest edge. This does not apply to beams of cross sections above 200 X 200 mm.

8.4 Wane:

- a) For sections up to and including 150 X 150 mm:

Shall be permissible upto 1/5 of the width on the broad face subject to a maximum of 70 mm and upto 1/3 of the width on the narrow face subject a maximum of 50 mm, provided that one broad face is completely free from this defect. The wane shall be measured at its deepest part

- b) For sections above 150 X 150 mm:

The cumulative lengths of waness on all the sides should not be more than one length of the piece.

8.5 End splits:

The longest end split at each end shall be measured and the lengths added together. The total length of these shall not exceed 80mm per meter run of the piece.

8.6 Live knots:

8.6.1 Knots on the surface:

- a) Up to & including 25 mm diameter:

A maximum of 5 knots/meter length are permissible. However, the knots shall not be so grouped or located as to affect the strength of the piece.

- b) Over 25mm and up to and including 70 mm diameter:

A maximum of 2 knots/metre length are permissible.

CORPORATE PURCHASING SPECIFICATION



8.6.2 Knots on the edges:

- a) Up to and including 10 mm diameter and for full thickness:

A maximum of 2 knots/metre length are permissible

- b) Over 10 mm and up to & including 50 mm diameter and for less than half thickness:

A maximum of 2 knots/metre length are permissible.

8.7 Dead knots:

- a) Below 10 mm diameter:

A maximum of 3 knots/metre length are allowed provided that the knots are not so grouped or located as to affect the strength.

- b) From 10 mm to up to and including 25mm diameter:

A maximum of 2 knots allowed to the extent of 1 knot/metre length.

- c) Above 25 mm diameter:

Not allowed

Note: (For clauses 8.6 & 8.7): Major axis of the knot should be taken as the diameter of the knot

8.8 Surface cracks:

Surface cracks with a maximum depth of 10% of the thickness are permissible. A continuous crack of any depth all along the length is not permissible.

8.9 Sap Wood:

Permissible up to a maximum of 12 percent of the cross sectional area.

9.0 END COATING:

Timber shall be coated with any of the following effective compositions upto a distance of 80 mm from each end

- 9.1 Thick coal tar or bituminous paint.

- 9.2 Resin and lamp black (10:1) melted, mixed and applied hot.

- 9.3 Hardened gloss oil.

- 9.4 Paraffin wax.

- 9.5 Molasses and lime (3:1).

- 9.6 Geru/Yellow clay



CORPORATE PURCHASING SPECIFICATION

AA51401

Rev No.03

PAGE 5 of 6

10.0 INSPECTION AT SUPPLIER'S WORKS:

Whenever specified, tests and inspection are to be conducted in the presence of BHEL's representative. BHEL representative shall have free access at all times while work on the contract is being performed to all parts of the manufacturer works. The manufacture shall offer BHEL's representative all reasonable facilities, without charge, to satisfy the latter that the material is being furnished in accordance with this specification.

The manufacturer shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works the manufacturer, shall make necessary arrangements for carrying out the prescribed tests elsewhere. The manufacturer shall notify BHEL in advance about the readiness of the material for inspection and testing. BHEL reserves the right to test the material at BHEL's Works and the final acceptance of the material shall be based on these test results

11.0 TEST CERTIFICATES:

Three copies of test certificate shall be supplied unless otherwise stated on the order.

In addition, supplier shall ensure to enclose one copy of test certificate along with their dispatch documents to facilitate quick clearance of the material.

The test certificate shall have the following information:

AA51401 (Rev.No. 03): CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSES

BHEL order No.:

Supplier's References:

Type & Specie:

Treatment, if any:

Results of Dimensional Inspection:

Moisture content:

Defects as per clause 8.0:

Size:

Quantity supplied:

12.0 MARKING:

The timber shall be marked/painted with the following:

AA 514 01

BHEL order No. :

Supplier's Name :

Size & Quantity :

CORPORATE PURCHASING SPECIFICATION



13.0 REJECTION AND REPLACEMENT:

If the material does not conform to the requirements of this specification or found defective during further processing, such material shall be rejected not withstanding any previous certification of satisfactory testing and/or inspection. The supplier shall under take to replace the rejected consignment at his own cost and the rejected material shall be taken back by the supplier after fulfilling the commercial terms and conditions.

14.0 REFERRED STANDARDS:

The following is the list of the latest standards, as published by the respective issuing bodies, referred to in this specification.

- | | | |
|-------------|-------------|-------------|
| 1) IS: 190 | 2) IS: 287 | 3) IS: 707 |
| 4) IS: 2500 | 5) IS: 3364 | 6) IS: 6662 |



CORPORATE PURCHASING SPECIFICATION

AA51402

Rev No. 03

PAGE 1 of 5

NON-CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSES

1 GENERAL

This specification governs the quality requirements of Non-Coniferous Timber supplied in the form of planks, battens, beams and sleepers.

2 APPLICATION

Used for general packing purposes.

3 COMPLIANCE WITH NATIONAL STANDARDS

There is no National standard covering this material. However, assistance has been derived from the following National standards:

- IS 1326-1992: Non-Coniferous Sawn Timber (Baulks & Scantling)
- IS 5966-1993: Non-Coniferous Timber in Converted Form for General Purposes
- IS 6662-1993 Groups I & II: Timber Species Suitable For Wooden Packaging

4 TERMINOLOGY

For the purpose of this specification, the definitions given in IS 707 (Glossary of terms applicable to timber and timber products) shall apply except for the beam which is defined as follows:

Beam is defined as converted timber whose cross-sectional dimensions exceed 50mm in both directions.

5 SPECIES

Shall be as stated on the order- Some standard species are:

Trade Name	Botanical Name
Rubber wood	Hevea brasiliensis
Salai	Boswellia serrata
Bahera	Terminalia bellirica
Jaman	Syzygium cumini
Trade Name	Botanical Name
Lendi	Lagerstroemia parviflora
Mango	Hangifera indica
Machilus(Kalamavu)	Machilus macrantha
Irul	Xylis xylocarpa
Irulbaken	Hopes
Karumarudu	Terminalia tomentosa
Murtenga	Bursera serrata
Nangal	Mesua ferrea
Pillamarudu	Terminalia paniculata
Sal	shorea robusta

Revisions:

Clause 6.2.3 of MOM of WG (T&PM)

APPROVED:

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(T&PM)

Rev No.03

Amd No. 03

Reaffirmed

Prepared
HEP, Bhopal

Issued
Corp.R&D

Dt. of 1st Issue
01-03-1980

Dt:01-10-1995

Dt:

Year:2018



Silver oak	Grevillea robusta
Tada(Dhaman)	Grewia tillifolia

Any other species of wood as per Groups I & II of IS 6662 may also be ordered.

6 DIMENSIONS AND TOLERANCES

6.1 Sizes

Width, thickness and length of timber shall be clearly stated on the order.

6.2 Tolerances

6.2.1 Width: 50 to 250 mm, Tolerance: ± 3 mm

6.2.2 Thickness: 20 to 250 mm, Tolerance: $+3$ mm
 -1 mm

6.2.3 Length

Standard length : 1 to 12 metres in multiples of 0.5 metre

Tolerance : $\pm 2\%$ or ± 25 mm whichever is less.

Note

1) Measurements

1.1) When nominal sizes are ordered, length, width and thickness shall be measured on the basis of accepted sizes. Plus tolerances shall not be added while computing the volume.

1.2) The measurements of length, width, thickness and computation of volume shall be as follows:

- The length shall be measured in metres in midline of a piece. The fractions of a metre shall be rounded off to the nearest lower 10 mm.
- The width shall be measured at the narrowest place in millimetres and shall be rounded off to the nearest lower one millimetre.
- The thickness shall be measured at the narrowest place in millimetres and shall be rounded off to the nearest lower one millimetre.
- The volume shall be computed in cubic metres correct to three places of decimal on the basis of accepted sizes.

2) Single sampling plan based on IS 2500 shall be followed.

7 MOISTURE CONTENT

The timber shall have a moisture content as stated below within a depth of 15mm from the surface excluding a length of 300mm from each end at the time of inspection. The moisture content will be determined in accordance with Appendix-A of IS 287.

October to June : 30%

July to September (Rainy season) : 40%

8 FREE FROM DEFECTS

Timber shall be free from the following defects:

Brashness, splits across the grain, shakes, spring, twist, insect attack, any kind of decay (rot), any sign of infection, open centre heart, centre heart on planks and any other defect.

Defects to the extent specified below are permissible. These defects shall be measured in accordance with IS 3364.

8.1 Bow

Shall be permissible upto a maximum of 2mm for 300mm length.



CORPORATE PURCHASING SPECIFICATION

AA51402

Rev No. 03

PAGE 3 of 5

8.2 Wane

- a) For sections upto and including 150 X 150 mm:

Shall be permissible upto 1/5 of the width on the broad face subject to a maximum of 60mm and upto 1/3 of the width on the narrow face subject a maximum of 40mm, provided that one broad face is completely free from this defect. The wane shall be measured at its deepest part.

- b) For sections above 150 X 150 mm

The cumulative lengths of waness on all the sides should not be more than one length of the piece.

8.3 End splits

The longest end split at each end shall be measured and the lengths added together. The total length of these shall not exceed 60mm per metre run of the piece.

8.4 Live knots upto 35mm diameter

A maximum of 5 knots/metre length are permissible. However, the knots shall not be so grouped or located as to affect the strength of the piece.

Live knots above 35mm diameter are not permissible.

8.5 Dead knots

- a) Below 10mm diameter

A maximum of 3 knots/metre length are allowed provided that the knots are not so grouped or located as to affect the strength.

- b) From 10mm to upto and including 25mm diameter

A maximum of 2 knots allowed to the extent of 1 knot/metre length.

- c) Above 25mm diameter

Not allowed.

Note: (For clauses 8.4 & 8.5): Major axis of the knot should be taken as the diameter of the knot.

8.6 Surface cracks

Surface cracks with a depth of 10% subject to a maximum of 10mm are permissible. A continuous crack of any depth all along the length is not permissible.

8.7 Sap wood

Permissible upto a maximum of 12 percent of the cross sectional area.

9 END COATING

Timber shall be coated with any of the following effective compositions upto a distance of 80mm from each end.

- 9.1 Thick coal tar or bituminous paint.

- 9.2 Resin and lamp black (10:1) melted, mixed and applied hot.

- 9.3 Hardened gloss oil.

- 9.4 Paraffin wax.

- 9.5 Molasses and lime (3:1).

- 9.6 Geru/Yellow clay.



10 INSPECTION AT SUPPLIER'S WORKS

Whenever specified, tests and inspection are to be conducted in the presence of BHEL's representative. BHEL representative shall have free access at all times while work on the contract is being performed to all parts of the manufacturer works. The manufacturer shall offer BHEL's representative all reasonable facilities, without charge, to satisfy the latter that the material is being furnished in accordance with this specification.

The manufacturer shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works the manufacturer shall make necessary arrangements for carrying out the prescribed tests elsewhere. The manufacturer shall notify BHEL in advance about the readiness of the material for inspection and testing.

BHEL reserves the right to test the material at BHEL's Works and the final, acceptance of the material shall be based on these test results.

11 TEST CERTIFICATES

Three copies of test certificate shall be supplied unless otherwise stated on the order.

In addition, supplier shall ensure to enclose one copy of test certificate along with their dispatch documents to facilitate quick clearance of the material.

The test certificate shall have the following information:

- AA51402, Rev.No.03 : NON-CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSES
- BHEL order No. :
- Supplier's References :
- Type & Specie :
- Treatment, if any :
- Results of Dimensional Inspection :
- Moisture content :
- Defects as per clause 8 :
- Size :
- Quantity supplied :

12 MARKING

The timber shall be marked/painted with the following:

- AA51402
- BHEL order No.
- Supplier's Name
- Size & Quantity

13 REJECTION AND REPLACEMENT

If the material does not conform to the requirements of this specification or found defective during v further processing, such material shall be rejected notwithstanding any previous certification of satisfactory testing and/or inspection. The supplier shall under take to replace the rejected consignment at his own cost and the rejected material shall be taken back by the supplier after fulfilling the commercial terms and conditions.



CORPORATE PURCHASING SPECIFICATION

AA51402

Rev No. 03

PAGE 5 of 5

14 REFERRED STANDARDS

The following is the list of the latest standards, as published by the respective issuing bodies, referred to in this, specification.

- 1) IS 287
- 2) IS 707
- 3) IS 1326
- 4) IS 2500
- 5) IS 3364
- 6) IS 5966
- 7) IS 6662

**CORPORATE PURCHASING SPECIFICATION**

AA 514 20

Rev. No. 02

PAGE 1 OF 4

MULTILAYERED CROSS LAMINATED POLYETHYLENE FILM**1.0 GENERAL:**

This specification governs the quality requirements of multilayered cross laminated polyethylene film. The cross lamination gives qualities of extra toughness, together With flexibility and lightness coupled with good weather resistance to ultra violet rays.

2.0 APPLICATION:

Used for packing and allied purposes.

3.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian Standard covering this type of material.

4.0 AVERAGE WEIGHT, DIMENSIONS AND TOLERANCES:**4.1 Average weight & Sizes:**

Average weight (G.S.M), Width and Length shall be as stated on the order.

4.2 Average Weight & Tolerance:

45, 60, 70, 90, 105, 120, 150, 200, & 250 GSM with a tolerance of $\pm 10\%$.

4.3 Width and tolerance:**4.3.1 Preferred widths:**

900, 1000, 1500, 2000, 2500, 3000 and 3660 mm.

4.3.2 Tolerance on width:

Width, mm		Tolerance($\pm$) mm
Above	Upto & Includ.	
900	1250	8
1250	2500	20
2500	3000	40
3000	3660	50

Revisions :
As per e-mail dt. 4-08-2008 from Shri.Gopal Bhat,
SDGM, Bhopal

APPROVED:
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE- WG (T&PM)

Rev. No. 02	Amd. No.	Reaffirmed	Prepared BHOPAL	Issued Corp. R&D	Dt. of 1st Issue 1st October 1995
Dt.: 01.11.2008	Dt:	Year:			

AA 514 20	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 02		
PAGE 2 OF 4		

5.0 MANUFACTURE:

The film shall be comprised of several layers of plastic film placed criss-cross over one another and bonded by a special cold-roll technique. Film shall be resistant to most of organic & inorganic chemicals.

‘BHEL’ emblem of size A40 shall be embossed by thermostatic control on the film at an interval of 1000 mm along the length of the film.

The colour of the emblem shall be Air Craft Blue (Shade No. 108) as per IS: 5 or Black / Red.

One vertical heat sealing joint will be acceptable for films between 1200 mm and 2400 mm at the interval of 1200 mm width.

Two vertical heat sealing joint will be acceptable for films above 2400 mm at the interval of 1200 mm width.

6.0 APPEARANCE AND FINISH:

The film shall be uniform in colour, texture and finish. And also shall be free from pinholes, undispersed raw material, streaks and foreign particles and holes, tears or blisters. The edge shall be free of nicks and cuts to unaided eye.

7.0 COLOUR:

Unless otherwise specified, the film shall be supplied in Natural Colour (essentially colourless) for 45 GSM, yellow colour for 70 GSM & Blue colour for 90 GSM. Any other colour can also be ordered, if agreed mutually.

For film of other average weights, colour shall be as stated on the order.

8.0 ODOUR:

The film shall be free from any objectionable odour.

9.0 TEST METHOD:

Unless otherwise specified, the test shall be conducted in accordance with the relevant methods of IS : 2508.

10.0 TEST SAMPLES:

One Square metre (1 sq.m) of ordered thickness shall be supplied for testing purpose.



CORPORATE PURCHASING SPECIFICATION

AA 514 20

Rev. No. 02

PAGE 3 OF 4

11.0 PHYSICAL PROPERTIES:

Substance (GSM): 45, 50, 60, 70, 90, 105, 120, 150, 200, & 250.

Tolerance: $\pm 10\%$.

12.0 MECHANICAL PROPERTIES:

12.1 Tensile Strength at Break:

Direction N/mm^2 , min.

Direction - I 35

Direction - II 37

12.2 Elongation at Break:

Direction - I 500 percent, min.

Direction - II 400 percent, min.

12.3 Tear Resistance in/grams (ASTM – D 1922):

GSM 45 60 70 90 105 120 150 200 250

Direction I 800 1800 1800 2150 2500 3200 3500 4500 5500

Direction II 650 1500 1500 1950 2000 2000 2500 3500 4500

13.0 INSPECTION AT SUPPLIERS' WORKS:

Whenever specified, tests and inspection are to be conducted in the presence of BHEL'S representative.

BHEL'S representative shall have free access at all times while the work on the contract is being performed, to all parts of the manufacturer's works.

The manufacturer shall offer BHEL's representative all reasonable facilities without charge to satisfy the latter that the material is being furnished in accordance with this specification. The manufacturer shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities do not exist at his works, the manufacturer shall make necessary arrangements for carrying out the prescribed tests elsewhere.

The manufacturer shall notify BHEL's representative in advance about the readiness of the material for inspection and testing.

BHEL reserves the right to test the material at BHEL's works and the final acceptance of the material shall be based on these test results.

AA 514 20	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 02		
PAGE 4 OF 4		

14.0 TEST CERTIFICATES:

Three copies of test certificates shall be supplied unless otherwise stated on the order.

In addition, the supplier shall ensure to enclose one copy of the test certificate along with their dispatch documents to facilitate quick clearance of the material. The test certificate shall bear the following information:

AA 514 20: Multilayered Cross Laminated Polyethylene Film.

Rev. No. 02

BHEL Order No.

Batch / Lot No.

Results of dimensional inspection.

Test results of clauses 11 and 12.

15.0 PACKING AND MARKING:

To be supplied in bundles / packages suitably packed to prevent damage during transit and storage.

AA 514 20

BHEL Order No.

Manufacturer’s name and grade

Batch No. / Lot No. and date of manufacture

Average weight, Width, Length and colour

Net weight of the Bundle / Package

16.0 REJECTION AND REPLACEMENT:

In the event of any film proving defective during the course of preparation, testing, subsequent use, etc such material shall be rejected notwithstanding any previous certification of satisfactory testing and / or inspection.

The supplier shall under take to replace the rejected film at his own cost and the rejected material shall be taken by the supplier after fulfilling the commercial terms and conditions.

17.0 REFERRED STANDARDS (Latest Publications Including Amendments) :

1. IS: 5 2. IS: 2508 3. ASTM - D 1992