



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 : Timber Species Suitable For Wooden Packaging
Groups III & IV

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	Abiespindrow	FIR
Deodar	Cedrusdeodara	DEO
Chir	Pinusroxburghil	CHR
Kali	Pinuswallichians	KAL
Khasi Pine	Pinuskhasya	KPI
Spruce	Piccasmithianaboiss	SPR

Revisions:
Cl. 6.2.2 of MOM of WG – (T&PM)

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

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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:

- 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 millimeters and shall be rounded off to the nearest lower one millimeter.
- 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 2mm for 300mm length.

8.2 Cud:

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

8.3 Centre heart:

Shall be permissible only on sleepers when it is not further than 35mm 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 70mm and upto 1/3 of the width on the narrow face subject a maximum of 50mm, 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 25mm 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 70mm 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 10mm diameter and for full thickness:

A maximum of 2 knots/metre length are permissible

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

A maximum of 2 knots/metre length are permissible.

8.7 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 up to 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 8.6 & 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 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.

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

AA 101 66

Rev. No. 06

PAGE 1 OF 3

GALVANIZED STEEL SHEET, GRADE 120 GPD/GC

1.0 GENERAL:

This specification governs the quality requirements of plain and corrugated galvanized steel sheets, grade 120 GPD/GC produced by hot-dip process.

2.0 APPLICATION:

Used for general purpose, such as paneling and roofing.

3.0 CONDITION OF DELIVERY:

Annealed or normalized and galvanized.

The sheets shall be supplied plain or corrugated as specified in BHEL order.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

Material shall comply with the requirements of the following National standards and also meet the requirements of this specification:

IS:277-2003, Gr.:120 GPD/GC: Galvanized steel sheet (Plain and corrugated)

5.0 DIMENSIONS AND TOLERANCES:

Sizes:

The material shall be supplied to the dimensions specified in BHEL order. Standard sizes shall be selected from IS:277.

Plain sheets shall be ordered on the basis of length, width and thickness.

Corrugated sheets shall be ordered on the basis of length, thickness, depth, pitch and number of corrugations.

5.2 Tolerances:

The tolerances on sheets and coils shall comply with IS : 513 as detailed below:

5.2.1 Length:

- 0 mm
- + 15 mm or 0.5 percent of length whichever is greater.

5.2.2 Diagonal:

The diagonal distances between the opposite corners of any sheet shall not differ by more than 20mm.

5.2.3 Width:

- 0 mm and + 10 mm.

Revisions :

CI. 27.6.12 OF MOM OF MRC-S&GPS

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (S&GPS)

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Year: 2013

BHOPAL

Corp. R&D

AUGUST, 1976

5.2.4 Mass:

The tolerance on mass of individual sheets shall be $\pm 10\%$ and tolerance on mass of each bundle of sheets shall be $\pm 5\%$.

5.2.5 Corrugations (When specified):

On depth	: ± 2.5 mm	Average of 4 measurements.
On pitch	: ± 5.0 mm	
On over all width after corrugations	: ± 25 mm	

6.0 MANUFACTURE :

The steels or coils used for galvanizing shall conform to the requirements of Gr.: O for corrugated and DD for plain of IS:513 or IS: 1079 and shall be either annealed or normalized. However, for corrugated sheets the maximum phosphorus content may be 0.09 percent.

Galvanizing shall be carried out by first pickling the black sheets or by cleaning the cold rolled coils in line and then dipping them in a bath of molten zinc at a temperature suitable to produce a complete and uniformly adhesive coating of zinc. The zinc ingots used for galvanizing shall conform at least to grade Zn 98 of IS:209.

7.0 FREEDOM FROM DEFECTS :

Galvanized plain sheets, corrugated sheets and coils shall be reasonably flat and free bare spots, holes, tears and other harmful defects.

Coils, however, may contain some abnormal imperfections which render a portion of the coil unusable since the imperfections in the coil can not be removed as in the case of cut lengths.

8.0 TEST SAMPLES:

8.1 Bend Test (For plain sheets):

Test pieces, 230 mm long and 75 to 100 mm wide, shall be cut both along and across the direction of rolling. Bend test pieces shall be selected at the rate of one set of 2 for every 1000 sheets or part thereof. Bend test shall not be conducted for corrugated sheets.

8.2 Coating Test:

One set of three samples, each 50 x 50 mm or 50 mm diameter shall be selected at random from one sheet for every 1000 galvanized sheets or part thereof. In the case of galvanized sheets produced from black sheets, one set of three samples shall be taken, two from an extremities of a diagonal and one from the middle of the sheet whereas in the case of galvanized sheets produced from cold rolled coils, one set of three samples shall be cut, one being from the middle of the width of sheet and one each from each side of sheet and in no case closer than 75 mm from the edge of the sheet.

9.0 BEND TEST (FOR PLAIN SHEETS):

Test samples prepared in accordance with clause 8.1 above shall withstand bending through 180° round a mandrel having a diameter equal to the number of times the thickness of the sheet specified in the table below without peeling or flaking of zinc.

Thickness of sheet, mm	* Mandrel diameter
Over 0.16 and upto & incld. 0.30	4
Over 0.30 and upto & incld. 1.60	3
Over 1.60 and upto & incld. 5.00	2

* Expressed as the number of times the thickness of sheet.



CORPORATE PURCHASING SPECIFICATION

AA 101 66

Rev. No. 06

PAGE 3 OF 3

10.0 ZINC COATING TEST:

Single Test:

One test sample bearing the lightest mass of coating out of the three test samples selected under clause 8.2 above, shall be used and the mass of the zinc coating when determined by the method given in IS:6745 shall not be less than 100 g/m².

The mass of coating shall represent the total mass of zinc, both sides inclusive.

11.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied.

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 101 66, Rev 06: Galvanized steel sheet, Grade 120 GPD/GC

BHEL Order No,

Supplier's name,

Identification No

Dimensional inspection

Results of bend and zinc coating tests.

Note: Material procured, supplied and certified as AA 101 66, Rev 05/IS:277, Gr.:120 GPD/GC and comply with the requirements of this specification is acceptable.

12.0 PACKING AND MARKING:

Sheets shall be securely packed in waterproof paper or hessian cloth and securely tied round with hoop iron and with wooden battens underneath to prevent the sheets from corrosion and damage during transit.

A metal label shall be securely attached to each bundle and shall bear the following information :

AA 101 66: Galvanized steel sheets, grade 120 GPD/GC

BHEL Order No,

Supplier's Name

Consignment and Identification No,

Size and Weight.

13.0 REFERRED STANDARDS (Latest Publications Including Amendments) :

1. IS : 209 2. IS : 277 3. IS : 513 4. IS : 1079 5. IS:6745



TSD 6208 B

PLANT STANDARD BHOPAL

BP 085 14 99

Rev. No. 03

PAGE 1 OF 4

SUPERSEDES
BP 085 14 99 (Rev.02)

TECHNICAL DELIVERY CONDITIONS FOR WOODEN PACKAGINGS

1. SCOPE :

This standard stipulates the technical delivery conditions for packing cases, crates, shooks and cradles manufactured as per drawings, covering requirements of species of timber, constructional features, tolerances, permissible defects, moisture content and marking etc.

2. COMPLIANCE WITH NATIONAL STANDARDS:

Assistance has been derived from the following Indian Standards in preparing this specification.

IS : 5247 (Part 2) - 1982 : Specification For Converted
(Reaffirmed: 2000) (Conifers) Packing Cases & Crates.

IS : 190-1991 : Specification For conifer-
(Reaffirmed: 2000) Soft Timber (Baulks Scantlings).

IS : 6662 -1993 : Specification For Timber
(Reaffirmed: 1998) Species Suitable For Wooden Packaging.

3. SPECIES:

Timber Species shall be stated on the order.

Some standard species are :

Trade Name	Botanical Name	Abbreviation
Fir	Abies Pindrow	FIR
Deodar	Cedrus deodara	DEO
Chir	Pinus roxburghii	CHR
Kail	Pinus Wallichiana	KAL
Khasi Pine	Pinus Khasya	KPI

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Rev. No. : 03

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TSD 6209 A

PLANT STANDARD BHOPAL

BP 085 14 99

Rev. No. 03

PAGE 2 OF 4

4. CONSTRUCTIONAL FEATURES:

4.1 Packagings shall be manufactured as per BHEL drawing.

4.2 Dimensions of wood used shall be as below :

4.2.1 Planks

Thickness : 25, 40 and 50 mm.
Width : 140, 150, 175, 200, 225 & 250mm

NOTE

(i) Planks below 150 mm width are not to be used in plain packing cases, except that, maximum two number of planks with a width of 75 mm and above, can be used for adjustment of dimension of each shook. But in no case these are to be used in the ends.

(ii) In T & G packing Cases the minimum finished width of plank should not be less than 140 mm.

4.2.2 Battens/Scantlings/Beams:

Thickness : 50, 75, 100, 150, 200, 250 & 300 mm

Width : 75, 100, 150, 200, 250, 300 mm

4.3 In case of tongue and groove packing cases/shooks, plaining is to be done as per Drawing supplied along with the order.

4.4 For plain packing cases/shooks, maximum gap allowed between planks is 3 mm.

For Tongue and Groove joint packing cases/shooks, the maximum gap shall be :-

- 2 mm for lengths upto 2000 mm.
- 3 mm for lengths above 2000 mm.

4.5 Arrangement of nailing is to be done as per drawing supplied along with the order. Nails should be at least 25 mm away from the knot.

4.6 Hardware, excluding wire nails, shall be supplied by BHEL.

5. TOLERANCE:

5.1 For Timber Used in manufacture of packagings:

Thickness : + 3 or -1 mm
Width : + or -3 mm

NOTE:

The **negative** tolerance should not be in more than 20X of total quantity of planks, battans & beams.



TSD 6209 A

PLANT STANDARD BHOPAL

BP 085 14 99

Rev. No. 03

PAGE 3 OF 4

5.2 For Packing Cases/Shooks/Crates/Cradles:

Length/Width/Height : Upto 1830 mm : .+ 5 or - 0mm
From 1831 to 3050 mm: +10 or - 0 mm.
From 3051 to 4570 mm: +15 or - 0 mm.
Above 4571 mm ~~or~~ +20 0 mm.

6. PERMISSIBLE DEFECTS:

6.1 Timber shall be free from cracks, rotten wood and infected wood when examined visually.

6.2 Defects to the extent specified below are permissible.

6.2.1 Live Knots:

6.2.1.1 Knots on the surface:

a) Upto & Including 25mm 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.

b) Over 25 mm and upto and incld. 100mm diameter :

A maximum of 2 Knots/metre length are permissible.

6.2.1.2 Knots On The Edges:

a) Upto and incld. 10mm diameter and for full thickness:

A maximum of 2 Knots/metre length are permissible.

b) Over 10 mm & upto & incld. 50 mm diameter & for full thickness and upto 100 mm diameter & 60X Thickness :

A maximum of 2 knots/metre length are permissible.

6.2.2 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 upto and incld. 25 mm diameter:

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

c) Above 25 mm diameter:

Not allowed.

NOTE:

For the purpose of this standard the definitions given in IS : 707 (Glossary of Terms Applicable to Timber and Timber Products) shall apply.



TSD 6209 A

PLANT STANDARD BHOPAL

BP 085 14 99

Rev. No. 03

PAGE 4 OF 4

7. MEASUREMENTS:

- 7.1 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.
- 7.2 The measurement of length, width, thickness and computation of the volume shall be made as follows. A steel tape scale with a least count of 1.0 mm shall be used, for the measurement.
- 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 10mm.
 - 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 millimetres and shall be rounded off to the nearest lower one mm.
 - d) The volume shall be computed in cubic metres correct to three places of decimal on the basis of accepted sizes.

8. MOISTURE CONTENT:

The packing wood shall have moisture content as stated below within a depth of 15 mm 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 Appendix -A of IS : 287, 1993. (Reaff. 1998)

Nov. to April : 30% max.
May to Oct. : 40% max.
(Rainy Season)

9. MARKING :

- 9.1 Supplier should do colour coding allotted to them for identification on each shook/case.
- 9.2 The individual packing case/shook should bear at the edge (thickness), the TFC No. as per the scheme given below in visible paint, in letter size of 20 mm to 35mm.

For example Drg.No.TFC - 120.

It should be written.

For Top - TFC 120 T.
For Base - TFC 120 B.
For Side - TFC 120 S

- 9.3 Wherever cases are supplied in assembled condition the TFC should be painted on right hand corner inside the box.



BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
QUALITY PLAN FOR- CONIFEROUS TIMBER FOR GENERAL PACKING
(IS-190 GRADE-I)

1/2

Page 1 of 2
 DATED: 04.01.2013

QUALITY PLAN NO. CDC-01 Rev-01

SL. NO	COMPONENT	CHARACTERISTICS	TYPE OF CHECK	QUANTAM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	INSPECTION AGENCY	REMARKS
1	Wooden Planks / Battens / Beams for packing purposes	Type of species or Trade Name	V	100%	AA 51401 / PO	AA 51401 / PO	TC	Third Party or BHEL	
		Dimension a) Length b) Width c) Thickness	M	As per Single Sampling Plan	AA 51401 / PO	AA 51401 / PO	TC	Third Party or BHEL	TC to be submitted as per Single Sampling plan
		Visual Defects a) Bow b) Cup c) Centre Heart d) Knots e) Wane f) Surface Crack g) End Splits	V/M	As per Single Sampling Plan	IS-190 Grade-I	IS-190 Grade-I	TC	Third Party or BHEL	TCS to be submitted as per Single Sampling plan
		End Coating	V	100%	AA 51401	AA 51401	TC	Third Party or BHEL	
		Moisture Content	T	As per Single Sampling Plan	AA 51401	AA 51401	TC	Third Party or BHEL	TC to be submitted as per Single Sampling plan

Abbreviation: V - Visual, M- Measurement, T- Testing

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BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL

QUALITY PLAN FOR- CONIFEROUS TIMBER FOR GENERAL PACKING
(IS-190 GRADE-I)

Page 2 of 2

SINGLE SAMPLING PLAN FOR NORMAL INSPECTION (AS PER IS -2500)

Lot or Batch size (In Nos.)	Inspection Level	Sample Size
2 to 8	I	2
9 to 15	I	2
16 to 25	I	3
26 to 50	I	5
51 to 90	I	5
91 to 150	I	8
151 to 280	I	13
281 to 500	I	20
501 to 1200	I	32
1201 to 3200	I	50

Note : Lot or Batch size indicates material supplied in one Truck

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