

	TD-218 Rev.00	<b>PLANT STANDARD HYDERABAD</b>	<b>HY 049 05 69</b>
			<b>REV.NO. 05</b>
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### SEAWORTHY PACKING FOR EXPORT ORDERS

**1.0 SCOPE:**

This standard specifies the seaworthy packing methods for export orders.

**2.0 PACKING WOOD:**

2.1 The timber used shall be of non-coniferous type as per specification HY51463 for Beams & Runners.

2.2 Ply Wood planks as per specification IS:303 Gr. "MR" Type A,B are used for the Sides, Top & Bottom of the Packing Cases.

3.0 The packing cases are covered with GI sheet on outside for sides and top; inside for bottom as per the Sketch-I.

**4.0 PACKING CASES:**

4.1 Categorisation of Packing Cases:

The packing cases are categorised as follows:

4.1.1 Open packed consignment. Packing subjected to BHEL approval.

4.1.2 Closed packing cases:

a) All the export seaworthy packing of the items shall be covered with GI sheet covering as per the sketch – I enclosed.

b) Any other special or export seaworthy packing (improvement or equivalent to the above) shall be subjected to BHEL Engg & QC approval).

4.2 Packing procedure for closed packing cases:

4.2.1 Inner surfaces of the sides & bottoms, outer surfaces of top of all the categories of closed packing cases shall be covered with hessain bitumen coated polyethylene kraft paper/HDPE Tarpaulin 150 GSM weight (refer sketch 1).

4.2.2 Adequate battens (lined with water proof bitumenised paper/HDPE Tarpaulin 150 GSM together with rubber sheet) shall be provided at appropriate places to prevent the movement of equipment/component inside the packing cases.

<b>Revisions :</b> Revised Clauses 2.2, 8.01 and Sketch - I. Deleted Clause 8.10.			<b>Issued :</b> <b>STANDARDS ENGINEERING DEPARTMENT</b>		
<b>Rev.No. 05</b>	<b>Amd.No.</b>	<b>Reaffirmed</b>	<b>Prepared</b>	<b>Approved</b>	<b>Dt.of 1<sup>st</sup> Issue</b>
<b>Dt.APR.2001</b>	<b>Dt.</b>	<b>Year :</b>	VNR, KSN	DGM (E&CC)	DEC.1989

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### 4.3 Sealed Packing:

4.3.1 Components, sub-assemblies and assemblies sensitive to climatic conditions shall be packed seal tight wherever required.

All the openings of the sensitive components, sub-assemblies and assemblies shall be blanketed to prevent the ingress of dust and moisture wherever required.

4.3.2 The components, sub-assemblies and assemblies are completely covered with 2 layers of polyethylene sheet. All sharp corners and edges are to be protected by rubber mats to prevent the polyethylene sheet from damage. Excelsior, corrugated cardboard, felt or other hygroscopic materials shall not be used. The top surface of the case shall be free from dents to prevent rain water pockets.

**Note:** Seal tight packing case shall not be opened during transportation till destination. Therefore customs authorities and shipping agents shall be informed in advance of the arrival of item. Suitable arrangements shall be made with the authorities for customs clearance.

4.3.3 Certain special precautions are required for sealtight packing of Turbogenerator rotor and the same are specified in product standard no. TG 55507.

5.0 Turbogenerator stator is a special open consignment and the same shall be packed in accordance with product standard TG 55506 for compliance.

### 6.0 DESICCANT:

6.1 Desiccant (silicagel to spec IS:3401) is filled into dust free, air permeable linean bags. Silicagel bags inside the packing consignments such as boxes with or without sealed polyethylene sheets excluding Turbogenerator rotor and and stator need not be arranged in any particular way. However, these silicagel bags shall be arranged in a particular way as specified in the respective product standards/drawings for Turbogenerator rotor and stator.

### 6.2 Desiccant Quantity for Components:

The desiccant quantity depends on the dimensions of the polyethylene sheet as well as transit and storage time.



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**T A B L E - 1**

Desiccant Quantity in units of TROCKEN EINHEITN (TEH)  
(Drying Effectiveness Unit) (1 TEH = 35g)

Transit & Storage time	Upto 1 month	Upto 3 months	Upto 6 months	Upto 12 months
Parameters				
i) Sealed packages				
a) For 1m <sup>2</sup> surface area of sealed polyethylene sheet for Turbogenerator rotor.	14 TEH (450 g)	-	42 TEH (1470 g)	-
b) For 1m <sup>2</sup> surface area of sealed polyethylene sheet for other components.	-	9 TEH (315 g)	18 TEH (630 g)	36 TEH (1260 g)
c) For each kg of wood within sealed polyethylene sheet.	8 TEH (260 g)			
d) For each kg of foam rubber or other padding material within sealed polyethylene sheet.	1 TEH (35 g)			
e) For 1m <sup>3</sup> of air within the case.	15 TEH (525 g)			
ii) For closed packing cases without sealtight packing and special open consignment like Turbogenerator stator.				
a) For 1m <sup>3</sup> of air within the case.	15 TEH (525 g)			

6.3 Humidity indicators shall be fixed wherever specified in product standards, packing drawings.

## 7.0 SURFACE PROTECTION:

### 7.1 Volatile Corrosion Inhibitor (VCI) Paper:

Un-protected surfaces of steel and cast iron components, tools, bearings, shaft seals etc., are covered with VCI paper. VCI paper has been impregnated with corrosion inhibitors which by evaporation and chemical conversion, protect metals in an enclosed area against corrosion.

7 m<sup>2</sup> VCI paper is necessary for 1m<sup>3</sup> of packed item approximately.

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## 7.1.1 Application limitations:

VCI paper shall not be used for components made aluminium, aluminium alloys as well as zinc, copper, brass, cadmium and silver.

7.2 VCI powder is sprinkled inside the piping components and ends shall be protected with end covers as specified in plant standards, drawings.

## 8.0 GENERAL INSTRUCTIONS:

8.01 For packing and despatch of components, plant standard No. HY 0490572 – ‘Code of practice for storage, handling, packing and despatch of components’ shall be applicable.

8.02 For storage of different products and their components, plant standard no. HY 0490564 – ‘Code of practice for storage of different products and their components’ shall be applicable.

8.03 For handling, storage and preservation, plant standard no. HY 0490570 – ‘Instructions on handling, storage, preservation, represervation and transport of export order components at works and site, shall be applicable.

8.04 For nitrogen blanketing of heat exchangers, plant standard no. HY 0490562 – Preservation of heat exchangers prior to shipment’ shall be applicable.

8.05 All openings of components shall be blanketed to prevent the ingress of dust and moisture.

8.06 All packing cases shall contain a packing list inside a waterproof envelope. In addition, a copy of packing list will be kept in a metallic pocket outside the case.

8.07 All markings on the case shall be made of waterproof materials to prevent obliteration during transit.

8.08 All concerned designers shall identify the packing cases including direct despatch (DD) items as per the categories of packing indicated in clause 4. Components requiring special packing not included in this standard shall be covered by product standards.

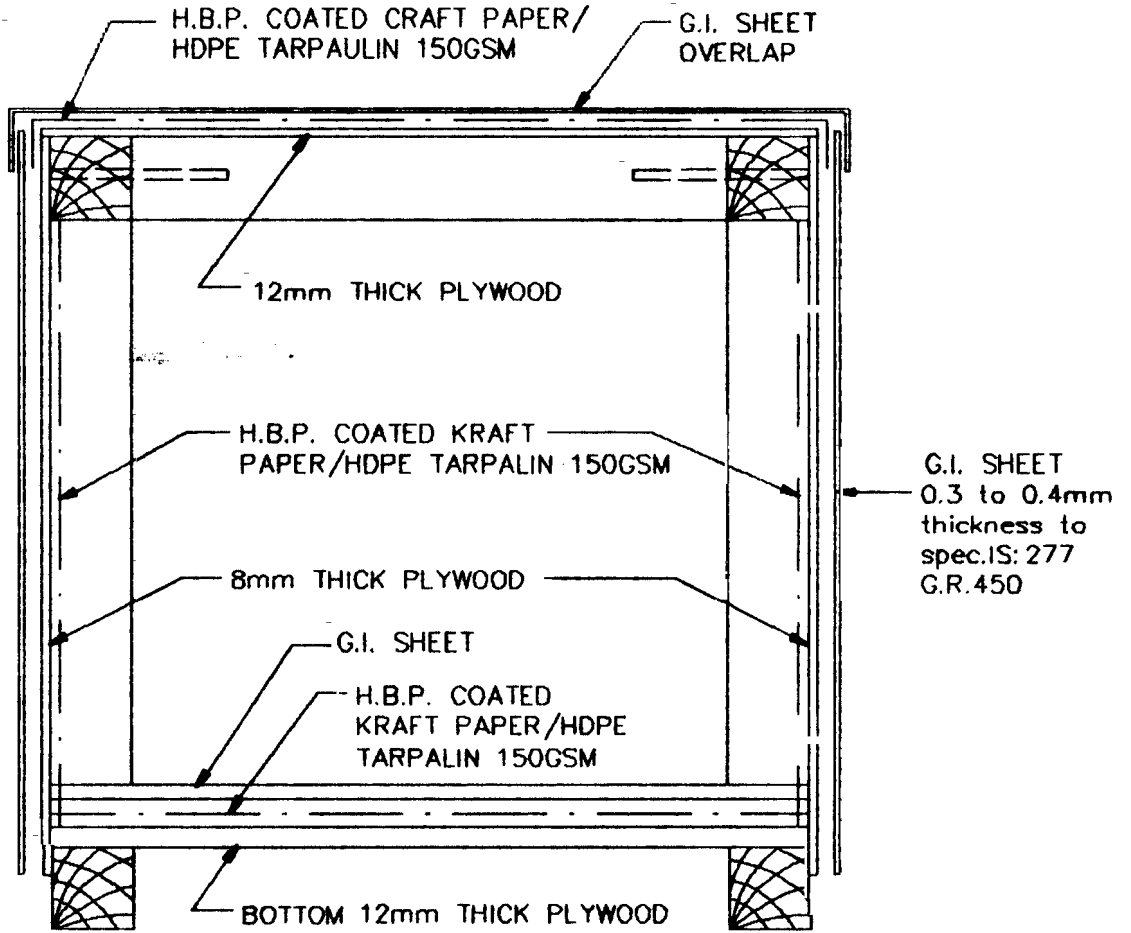
Suitable instructions for packing of DD items shall be incorporated in the purchase orders as per relevant product standards.

8.09 The details of packing materials are indicated in Sketch-I.

8.10 The following details shall be marked on the packing case:

- a) W.O. No.
- b) Case No.
- c) Net weight
- d) Gross weight
- e) Dimensions of box
- f) Markings showing:
  - i) Upright position.
  - ii) Sling position
  - iii) Storage position (P, Q, R, S)
  - iv) Fragile components
  - v) Any other special markings required by the customer

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CLOSED PACKING CASE WITH  
G.I.SHEET SHOWING LAYERS  
OF PACKING MATERIALS

SKETCH-I



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**NON-CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSES**

**1. GENERAL:**

This specification governs the quality of non-coniferous timber supplied in the form of planks, battens, beams and sleepers.

**2. APPLICATION:**

Used for the manufacture of packing cases/crates.

**3. COMPLIANCE WITH NATIONAL STANDARDS:**

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

IS: 399 – 1963 : Classification of commercial timbers and their zonal distribution.

IS: 1326 – 1992 : Specification for non-coniferous sawn timber (Baulks and Scantlings)

IS: 5966 – 1993 : Specification for non-coniferous timber in converted form for general purposes.

IS: 6662 – 1993 : Timber species suitable for wooden packaging - Specification.

**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 below.

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

**5. SPECIES:**

The species of non-coniferous timber shall be as per annexure I.

<b>Revisions:</b> Cl. No. 11 added. Cl. No. 3, 7.1 & 12 revised. Cl. No. 7.4 Deleted.			<b>Issued :</b> <b>STANDARDS ENGINEERING &amp; IPR COORDN. DEPARTMENT</b>		
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<b>Dt. NOV. 09</b>	<b>Dt.</b>	<b>Year</b>	<b>VNR</b>	<b>DGM(E&amp;CC)</b>	<b>MAY. 90</b>

**6. DIMENSIONS AND TOLERANCES:**

**6.1 Sizes:** Width, thickness and length of timber shall be clearly stated on the order/drawing.

**6.2 Tolerance:**

**6.2.1 Width:**

Width, mm	Tolerance, mm
50, 75, 100	+ 3
125, 150, 200, 225, 250	{ + 6 - 3

**6.2.2 Thickness:**

<u>Thickness, mm</u>	<u>Tolerance, mm</u>
20, 25, 35, 40, 50	+ 3
75, 100, 125, 150, 175, 200, 250	{ + 6 - 3

**6.2.3 Length:**

Standard length:

1 to 12 metres in multiples of 0.5 metre.

Tolerance:

± 2% or ± 50 mm whichever is less.

Note: The minus tolerances for width, thickness and length shall not be permitted in more than 10% of the timber supplied.

**7. SEASONING AND MOISTURE CONTENT:**

**7.1 Timber for packing purpose other than export orders:**

The timber shall have a moisture content of 30% maximum for planks and battens and 35% maximum for beams within a depth of 15 mm from the surface excluding a length of 30 cm from each end, at the time of inspection any time in the year. The moisture content will be determined in accordance with IS:287, IS:11215. This does not apply to timber procured in sleeper form for further conversion.

**7.2 Timber for packing purpose for export orders:**

The moisture content shall not exceed the maximum of 18%.



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**7.3** The moisture content % shall be specified in the order.

**8. FREEDOM FROM DEFECTS:**

Timber shall be free from the following defects:

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

The extent to which defects are permitted are given in Annexure II.

**9. END COATING:**

Timber shall be coated with any of the following effective compositions, upto a distance of 80 mm from each end or 20 mm more than the longest split, whichever is higher.

**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).

**10. END STRAPPING:**

Timber above 200 mm x 200 mm cross section shall be strapped with steel clamps to prevent end splitting.

**11. TREATMENT OF WOOD:**

Supplier shall ensure the following:

All wood packaging material used in packaging of export consignments are required to be rendered free from all pests either by heat treatment or by fumigation with Methylene Bromide as per ISPM-15 (International Standards for Phytosanitary Measures) by the accredited fumigation agencies recognised by the Government. Supplier should submit certificate to that extent.

The treated wood packaging material shall carry prescribed treatment mark as per ISPM-15 in addition to standard markings of ISPM-15 on his material.



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**12. CERTIFICATES:**

The supplier shall furnish a certificate with each lot/consignment in support of the type of species, treatment (Fumigation/Chemical) and moisture content.

**13. MARKING:**

The timber shall be marked/painted in order to identify the source of supply in accordance with our instructions.



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**ANNEXURE - I**

**SPECIES OF NON-CONFEROUS TIMBER RECOMMENDED FOR HEAVY PACKING  
CASES/CRATES**

Sl. No.	Botanical Name	Standard Trade Name	Local Names	Abbreviated Symbol
1.	<u>Fagara burdrunga</u>	MULLILAM	MUTTILAM (Tamil), RHETSA (Telugu); BEPULI (Uudu)	MUY
2.	Careya arborea	KUMBI	KUMBHI (Assam & Bengali), KAMBI (Hindi)	KUM
3.	Syzygium Cumini	JAMAN	JAMUN (Hindi & MP); JAMUK (Assam); JAM (Bengali); KUDA (Koli); JAMU (Oriya); JAMBU (Gujarati); NERLU, NERULA (Kannada); JAMBUL (Marathi); NAVAL (Malayalam & Tamil); NEREDU (Telugu)	JAM
4.	Apha – namixis Polystachya	PITRAJ	BOGA, AMARI (Assam); LOCHUNI, LOSHUNE (Bengali); RAKTATOHIDA (Marathi), MULLUMUTTAGA (Kannada); KARAGIL (Malayalam), VEKKALI, VELLAKONGU (TAMIL)	PIT
5.	Albizzia procera	SAFID-SIRIS	SAFED- SIRIS (Hindi); SIT (Andamans); KOROI (Assam & Bengali); TENTHRA (Koli); DHALASIRISH (Oriya); KINHAI, KILAI (Marathi); GURER (MP); KARANGRO (Gujarati); BELLATI, SALVAGAI (Kannada); VELLAVAKA (Malayalam); VELVAGAI (Tamil); TELLACHINDUGA (Telugu)	SSI
6.	Terminalia bellirica	BAHERA	BAHERA (Hindi & Marathi); BHAIRA (Punjabi); BHOMARA (Assam); LUMPUNG (Koli); BAHADA (Oriya); BAHETA (Gujarati); THARE, TARE, TARI (Kannada); BAHELA (Marathi); THANNI (Malayalam ); TANI (Tamil & Telugu)	BAH
7.	Logerstroemia parviflora	LENDI	ASIDH, DHAURI'SIDA (Hindi); MECHI (Assam); SIDHA (Bengali & Oriya); GARASEKRE (Koli); BURI – DHAMERO (Nepali); LENDIA – SENHA (Marathi); KALIASAJA, LENDI (MP) BONDARO (Gujarati); NANAGU (Malayalam); PEIKADUKKAI (Tamil); CHENNANGI (Kannada & Telugu)	LEN

Sl. No.	Botanical Name	Standard Trade Name	Local Names	Abbreviated Symbol
8.	Acrocarpus Fraxini folius	MUNDANI	MANDANE (Nepali); BELANJI (Kannada); KURANYAN, MALAVEPPU (Malayalam); MALAMKOMAI (Tamil)	MUN
9.	Dysoxylum Mala baricum	WHITE CEDAR	BILIDEVADARI (Kannada); VELLA – GIL (Malayalam & Tamil)	WCE
10.	Mangi fera India	MANGO	AM (Hindi & Assam); AMB (Punjabi); ULI (Koli); AMBA (Oriya & Marathi); MAVU (Kannada) MAMARAM (Tamil); MAMIDI (Telugu)	MAN
11.	Lagerstroemia Speciosa	JARUL	AJHAR (Assam); GARASEKRE (Koli); PUNIPATULI (Oriya); NIRMARUTHU (Malayalam); POOMARUTHU, PUMARUDU (Tamil)	JAR
12.	Adina Corodifolia	HALDU	HALDU, KARAM (Hindi); TARAK COPA (Assam); RANGKAT (Bengali) KUMBHA (Koli); KURUMA (Oriya); HALDU, HEDU (Marathi); KARAM (MP); HALWDWAR, HALDWAN (Gujarathi); HEDDI, YETAGAL, YETTAGA (Kannada); BIMBU (Malayalam); KADAMBERI, MANJAKADAMBAI (Tamil); HALDAWA (Urdu); BANDARU (Telugu)	HAL
13.	Dipterocarpus Indicus	GURUJAN	GARJAN (Assam); YENNEMARA (Coorg); KALPAYINI, KALPINE (Malayalam); ENNEY, VELLAYINI (Tamil); KALPINE (Kannada); GURGAL (Urdu).	GUR
14.	Lagerstroemia Lonceolata	BENTEAK	Nana (Gujarati & Marathi); NANDI, BENDEKU (Kannada); VENTEAK (Malayalam); BETHEKKU, VENTHEKHU (Tamil); BILLINANDI, BOLULTAR (Telugu)	BEN
15.	Dipterocarpus macrocarpus	HOLLONG	HOLLONG (Assam)	HON
16.	Mitragyna Parvifolia	KAIM	GURI, KALAM, PHALDU (Hindi); HAMSABETI (Koli); MITUKUNIA (Oriya)	KAM



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Sl. No.	Botanical Name	Standard Trade Name	Local Names	Abbreviated Symbol
17.	Terminalia procera	WHITE BOMBWEE	DADAM (Andaman)	WBO
18.	Artocarpus hirsuta	AINI	HEBBALASU, HEBHULSINA (Kannada); PATHPHANAS (Marathi); AINIPILAVU (Malayalam); AINIPILA ANJILI (Tamil)	ANI
19.	Terminalia Myriocarpa	HOLLOCK	PANISAG (Nepali)	HOL
20.	Protium Serratum; Bursera Serreta	MURTENGA	ERRA KARRA (Telugu)	MUR
21.	Grewia- Ti Lifolia	DHAMAN	TADA (Telugu); DADSAL, THADSAL (Kannada); CHADACHI (Malayalam) THADACHI (Tamil); PEDDA JANA (Telugu)	DHA
22.	Albizialebeck	KOKKO	SIRIS (Hindi & Oriya); SARIN, SHRIN (Punjabi); HIRIH (Assam); SIRISH (Bengali); CHICHOLA (Marathi); BAGE (Kannada); VAKA (Malayalam); VAGAI (Tamil); DIRISINAM (Telugu)	KOK
23.	Holoptelea- Intergrifolia	KANJU	KANJU, PAPRI (Hindi); KUMKAR, RAJAIN (Punjabi); ANJAN (Bengali); CHIBIL, DHAURANJO (Oriya); PAPARA (Marathi); CHILWAL, CHIROL, KARANJI (MP) THAPSI (Kannada); AVAL (Malayalam) AYILI (Tamil)	KAJ
24.	Schimawallichy Choisy	CHILAUNI	GOGRA, MAKRISAL (Assam)	CHL
25.	Xylixyclocarpa	IRUL	KONGRA, TANGAN (Oriya); SURIA (Marathi); SAURIYA (MP) JAMBE (Kannada); IRUL (Tamil), KONDATANGEDU (Telugu)	IRU
26.	Hopea	HOPEA	BOGIMAR (Kannada); IRUMBOGAM (Malayalam); VELLAI – GONGU (Tamil)	HOP
27.	Teriminalia- tomentosa	LAUREL	ASNA, SAIN (Hindi); AISAN (Punjabi); HATANA (Koli); PUCCASAJ (Nepali); SAHAJA (Oriya); AIN, SADAR, SAJ (MP) KARUMARUDU (Malayalam); KARIMARUDU, MATTI (Tamil); NALLAMADDI (Telugu)	LAU

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Sl. No.	Botanical Name	Standard Trade Name	Local Names	Abbreviated Symbol
28.	Shorea robusta	SAL	SAKHU, SAL, SAKHUA (Hindi); SARJAM (Koli); RAIGAL –A SARGI (Oriya)	SAL
29.	Mesua ferrea	MESUA	GANGANE (Andaman); NAHOR (Assam); NAGESWAR, NAGKESAR (Bengali); NAGESWAR (Oriya); NAGASAMPIGI (Kannada); CHURULI (Malayalam); NANGAL, NANGU (Tamil); NAGAKESARI (Telugu)	MES
30.	Terminalia paniculata	KINDAL	HONAL, HONAGALU (Kannada); KINDAL (Marathi); PILLAMARUDU (Malayalam & Tamil); NALLAPULAGA (Telugu)	KIN
31.	Grevillea robusta	A CUNN	SILVER OAK	SOA

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**ANNEXURE -II**

**PERMISSIBLE DEFECTS**

Sl. No.	Defects	Extent Permissible
1.	BOW	Shall be permissible upto a maximum of 2 mm for 300 mm length of the piece.
2.	CUP	Shall not be permissible.
3.	END SPLITS	The longest end split at each end shall be measured and the lengths added together. The total length of the longest end split shall not exceed 60 mm per metre of the length of the piece.
4.	KNOTS	Live knots measuring from 20 to 35 mm in diameter and dead knots measuring upto 15 mm in diameter shall be permissible provided they are not so numerous or so grouped or located as to affect unduly the strength of the pieces.
5.	BORER HOLE  (DAED INFE- STATION)	Borer holes (dead infestation) shall be permissible, on one face only provided such holes are not deeper than 10 mm and are well scattered
6.	SAP WOOD WANE	Shall be permissible.
7.	WANE	Wane shall be permissible upto 1/5 of the width on a broad face, subject to a maximum of 60 mm and upto 1/3 of the width on the narrow face provided that one broad face and one narrow face is completely free from this defect. Wane shall not be present in more than 30% of the total number of pieces accepted at any one time.
8.	CROSS GRAIN	Shall be permissible upto a maximum deviation of 1 in 10.
9.	SURFACE CRACK	Depth of the deepest crack on any one face (excluding the ends) shall be permissible upto a maximum of 2 mm in case of planks and beams upto 50 mm thick, 3 mm for beams above 50mm and upto 100mm thick and 6mm for beams above 100mm thick. A continuous crack of any depth, all along the length, is not permissible.



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**CODE OF PRACTICE FOR STORING, HANDLING,  
PACKING AND DESPATCH OF COMPONENTS**

**1.0 SCOPE:**

This standard covers technical instructions for packing and despatch of components. The related packing materials are indicated in Annexure 1. This standard supersedes company standard HY0490301 Rev.01.

**2.0 PACKING CASE:**

2.1 Packing cases for special components like rotor, casings and other items shall be designed by central packing design cell based on the component drawing and the fixing and supporting methods indicated by engineering department.

2.2 The wood for packing cases shall conform to plant purchase specification no. HY51463 and HY51461.

2.3 Suitable stiffeners, steel brackets at corners, sides and for lifting shall be fixed to the packing case, wherever required.

**2.4 Nailing procedure:**

2.4.1 In the case of nailing two or more layers of the board together, having total thickness not exceeding 7.5 cm, the nail end shall be bent 0.9 cm or more to the direction making a right angle to the timber grain.

2.4.2 Nailing must be carried out carefully by arranging nails zigzag so as not to cause cracking of the planks. Further, each nail must be driven adequately so that its head shall not protrude above the plank surface or excessively sink below the board surface.

**3.0 ORIGINAL PACKING CASES:**

Care shall be taken while opening the packing cases at the stores receipt stage. The despatch from stores (DS) items like valves, precision instruments, condenser tubes etc. shall be despatched in the original packing cases received from supplier to avoid damage during transit, wherever possible.

**Revisions:**

Annexure I & II added.

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**Dt. NOV. 95**

**Dt.**

**Year:**

**CDC**

**DGM (EC)**

**AUG. 1994**



**4.0 RIGDITY OF COMPONENTS IN THE CASE:**

4.1 The movement of components in the packing case shall be arrested by fixing suitable wooden sections at proper places.

**5.0 STABILITY OF THE CASE IN THE WAGON:**

The movement of case in the wagon shall be arrested by providing necessary wooden support and suitable lashing.

**6.0 PROTECTION AGAINST INGRESS OF MOISTURE:**

Component shall be wrapped with VCI paper, waxed paper polythene sheet as applicable for the components/ products. 2 bags of indicating type silicagel in bleached and finished plain weave cloth bag each containing 0.5 Kg/m<sup>3</sup> volume of the case shall be placed in the packing case, wherever required.

**7.0 MEASURING INSTRUMENTS & DELICATE ITEMS:**

7.1 Temporary preservative shall be applied on the unpainted surfaces. The instruments shall be wrapped with waxed paper and packed preferably in the original packing/ thermocol boxes with suitable cushioning.

7.2 Glass instruments shall be covered with suitable cushioning material and preferably packed in original packing cases/ thermocol boxes.

7.3 Pressure gauge connections shall be protected with plastic caps.

7.4 The packing shall be fastened with adhesive tape and placed in a wooden case with cushioning material.

7.5 Fragile items shall be packed in separate boxes.

**8.0 PUMPS, ELECTRIC MOTORS, VENTILATORS ETC.**

8.1 The components of pumps, electrical motors, ventilators etc. Shall be cleaned to remove the preservative, dust etc and re-preserved.

8.2 Spare bearings shall be cleaned and then preservative grease shall be applied. The bearing shall be packed in cartons. Heavier bearings shall be packed in wooden cases.

**9.0 LOOSE PARTS LIKE FASTENERS, PIPE UNIONS ETC:**

9.1 These items shall be suitably preserved and wrapped in waxed paper. The items shall be packed in corrugated boxes.





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9.2 Loose parts pertaining to one individual group shall be packed in one fibreboard corrugated box as far as possible.

9.3 Fibre board boxes shall be packed in wooden boxes.

**10.0 PIPES, FLATS, ANGLES:**

10.1 Pipe and flange end covers:

10.1.1 The pipe end covers (external) for pipe sizes 6-610 mm O.D shall be as per plant standard HY7790962.

10.1.2 The flange end covers (external) for flange sizes ID=45mm, OD=70mm to ID=530mm, OD=600mm shall be as per plant standard HY7790963.

10.1.3 The stub end covers (external) for stub sizes 16.3 mm OD to 83 mm OD shall be as per plant standard HY7790964.

10.1.4 The pipe end covers (internal) for pipes on nom. Size 9 mm to 75mm shall be as per plant standard HY7790965.

10.1.5 Protective caps shall be provided for pipe/flange ends.

10.2 Steel tubes for general purpose upto and including 50 mm dia shall be bundled with 2 stranded mild steel wire. The steel wire dia shall not be lesser than 2 mm.

10.2.1 The recommended bundling places are as per table below:

Product weight	Upto 200 Kg.	>200 ≤300 Kg.	>300≤500	>700≤1000 Kg.
Number of bundling places	3	4	7	8

10.2.2 Steel tubes above 50 mm dia shall be shipped loose.

**10.3 Special purpose and heat exchanger tubes & pipes:**

10.3.1 Suitable rust preventive shall be applied to the items as per HY0490563.

10.3.2 The gross weight of the standard case for HE tubes shall not exceed 1500 Kg.

10.3.3 **U Tubes:**

10.3.3.1 U tubes shall be packed in moisture proof cases. Cloth bags of silicagel shall be placed in the case as per clause 6.



10.3.3.2 Longitudinal & transverse movement of tubes within the case shall be avoided by providing soft packing.

10.3.3.3 A horizontal layer of tubes shall be separated by polythene sheet.

10.3.3.4 Vertical rows of tubes shall be separated by wooden spacers to avoid rubbing and movement of tubes.

10.3.3.5 The two legs of the inner most U tube shall be separated by wooden spacers.

#### **10.4 FIN TUBES:**

10.4.1 Suitable cushioning material and soft pads shall be provided inside the case on all the sides.

10.4.2 Soft pads shall be kept between two horizontal layers of the tubes.

10.4.3 Spacers of soft material shall be kept between the 2 adjacent vertical rows to avoid interlocking of tubes.

10.5 Brass rods shall be wrapped with polythene sheet and packed in longitudinal boxes.

10.6 Straight lengths like bars, flats, angles shall be bundled with annealed steel wire of diameter 3 to 6 mm.

#### **11.0 IDENTIFICATION:**

The tag number as per completion schedule shall be painted on metal tag and tied with thin wire or tack welded to the individual items being despatched.

#### **12.0 PACKING SLIP HOLDER:**

The packing slip shall be fixed on the packing case at suitable location. The packing list shall be sealed in a polythene bag against the ingress of moisture and placed in the packing slip holder.

#### **13.0 MARKING:**

13.1 The following data shall be marked on two opposite sides of the case with waterproof black paint.

- a) BHEL and sender's address
- b) Company Monogram
- c) Consignee's full and correct address
- d) Identification number of the case



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- e) Net weight and gross weight of the case
- f) Rough dimensions of the case in cm
- g) Position of slings or chains for handling
- h) Indication of top of the case
- i) Name of the consignment (eg: "Instrument Panel", "Middle part MP casing", "Miscellaneous" etc.)
- j) Special remarks wherever applicable (eg: "Turbine rotor with care", "Glass instruments with care" etc.)
- k) The remark "NOT TO BE LOOSE SHUNTED", wherever applicable.
- l) Storage instruction code

e.g. P - Storage in a totally enclosed shed under controlled conditions.

Q - Storage in a totally enclosed shed.

R - Storage in a shed having roof but no side walls.

S - Storage in open yard on elevated platform/ wooden sleepers.

**14.0 HANDLING:**

Procedure for handling shall be as per HY0490571.

**15.0 NOTE:**

The following are the related documents on packaging and despatch of components.

- 15.1 OMI 064 - Procedure for packing and despatch of finished products.
- 15.2 AA 0232601 - Pictorial markings for handling, labling of goods in general.
- 15.3 AA 0232801 - Technical information on loading and transportation of consignments by railway wagons.
- 15.4 AA 0232802 - Loading particulars of standard railway wagon broad gauge and metre gauge.
- 15.5 AA 0232803 - Standard moving dimensions on indian railways broad gauge and metre gauge (for bogie goods stock).
- 15.6 HY0490563 - Code of practice for preservation of different products and their components
- 15.7 HY0490564 - Code of practice for storage of different products and their components.
- 15.8 HY0490571 - Procedure for handling of components.
- 15.9 HY0490569 - Seaworthy packing for export orders.
- 15.10 HY51463 - Non - conifer timber for general packing purposes.



- 15.11 HY51461 - Rubber wood for general packing purposes.
- 15.12 HY0490562 - Preservation of heat exchangers prior to shipment
- 15.13 HY0490570 - Instructions on handling, storage, preservation, reprereservation and transport of export order components at works and sites
- 15.14 HY0490571 - Procedure for handling of components

TABLE - 1

**PACKING MATERIALS**

Sl. No.	Description	IS No. and Grade	BHEL Spec./ Std. No.
1.	Waxed grease proof paper 0.3mm thkx900mmx100 mtrs	IS: 3962	AA51407
2.	Packing paper water proof bitumen laminated type 1	IS: 1398 Type 1	AA51410
3.	Polythene coated bitumen hessian kraft paper	IS: 1398 Type 3	AA51409
4.	Pressure sensitive adhesive tapes with poly-propylene plastic base	IS:13262	AA51412
5.	Pressure sensitive adhesive cloth	IS: 3687	AA51411
6.	Cotton tape for electrical purpose	IS: 1923	AA23107
<b><u>CUSHIONERS</u></b>			
7.	Wood wool	IS:1707	AA51404
8.	Rubberised coir sheets	IS: 8391	AA51415
9.	Woolen felt hard (Proofed) (Grey colour)	IS: 1719	AA23121
10.	Polythelene air bubbled film	IS:12787/89	HY78489



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Sl. No.	Description	IS No. and Grade	BHEL Spec./ Std. No.
11.	Rubber sheets	IS: 638 Gr. 1 Type A	AA59001
12.	Expanded polysterele (Thermocol) sheet	IS: 4671 Type- 2	AA51416
<b><u>BINDING &amp; FIXING MATERIALS</u></b>			
13.	MS binding wire galvanised		AA10110
14.	Hot rolled steel strip (baling)	IS: 1029	HY10189
15.	Metal seal (Tin) with BHEL emblem to suit steel strip		HY78462
16.	Steel counter sunk head wire nails	IS: 723	AA7177001
<b><u>MARKING MATERIALS</u></b>			
17.	High quality full glossy out door paint (Block)	IS: 2932	AA56126
18..	Non - yellowing full glossy white paint		AA56127
<b><u>OTHERS</u></b>			
19.	Corrugated fibre board boxes	IS: 2771 (Part 1)	AA51414
20.	Low density polyethylene film	IS: 2508	AA51408
21.	Low density polyethylene bags with BHEL Emblem printed on one side with one colour		AA51408
22.	Bleached cloth bag		HY78464

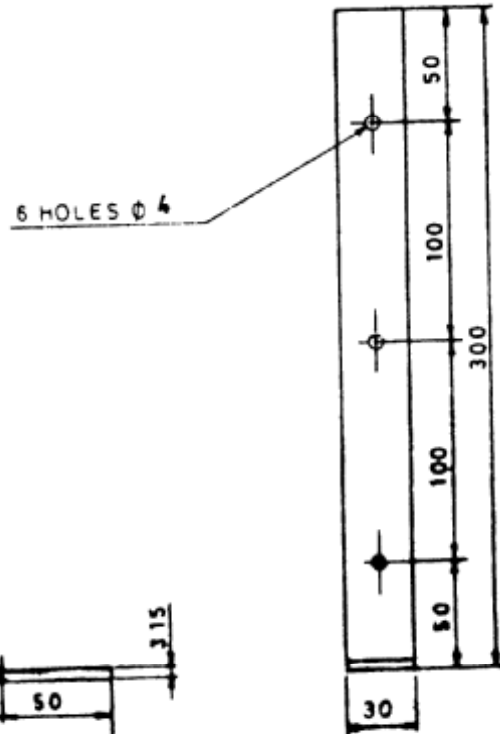
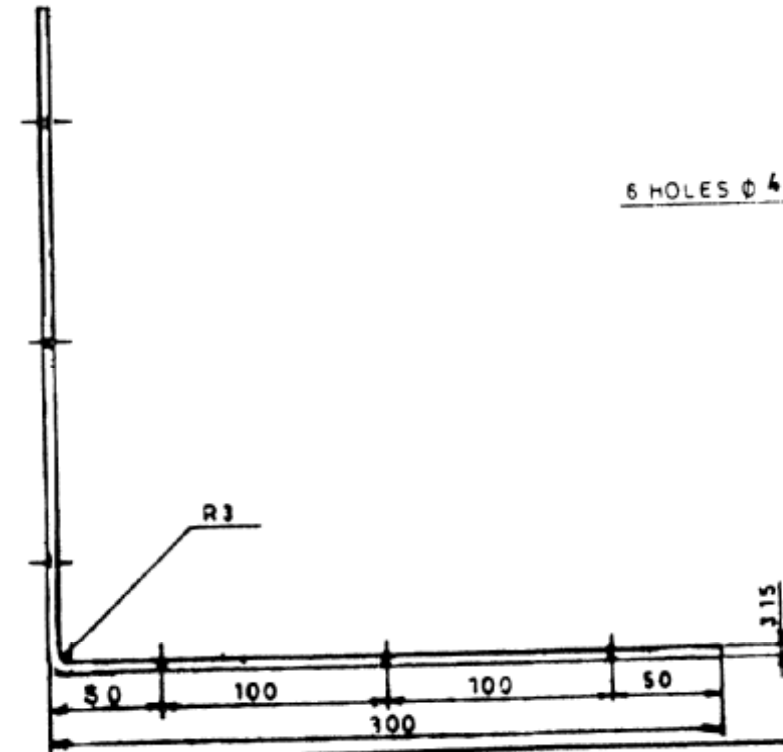
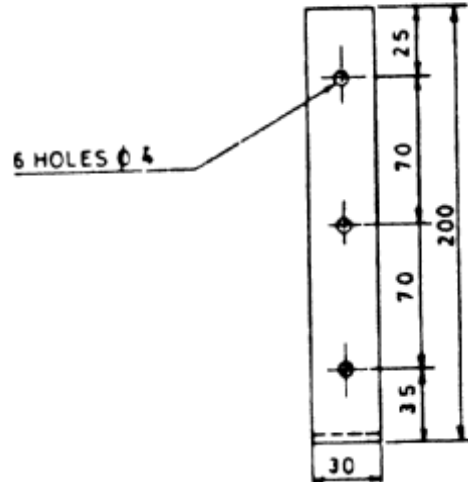
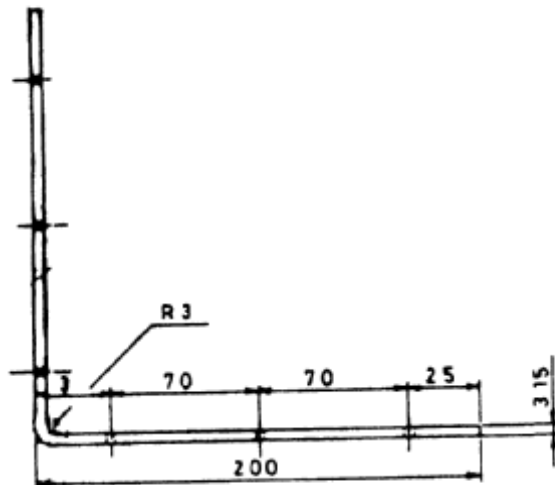
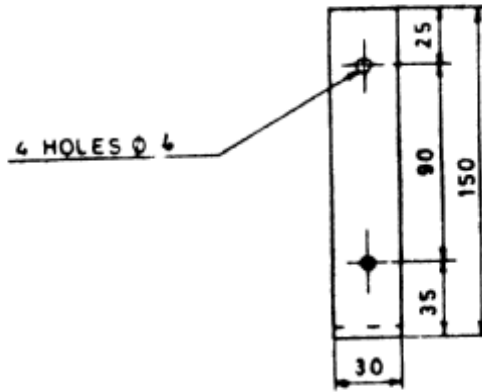
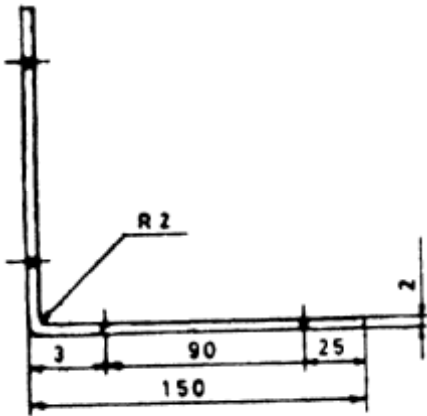
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Sl. No.	Description	IS No. and Grade	BHEL Spec./ Std. No.
23.	Plywood MR/AB	IS:303	AA51101
24.	G I sheet for name plate	IS:277	AA10166
25.	G I sheet plain		AA10166
26.	Pipe end covers (internal)		HY7790965
27.	Indicating type silicagel size 5 to 3 mm	IS: 3401	AA55619
<u>STANDARD FASTENERS</u>			
28.	Square head bolt, nut & washer		HY9601101
29.	Netlon protective sleeving		HY7840797
30.	MS clamps		
31.	HDPE Tarapaulin 60' x 40'	IS:7903	HY78133
	NYLON ROPES Ø 10 MM		HY78499
32.	VCI Rusto paper VCI Rusto powder		AA51406 AA55120
33.	Packing stud two sq. nuts & two sq. washers		HY9601411
34.	G I Binding wire		AA10110
35.	Metallic pouches Blue Red		

L CLAMPS

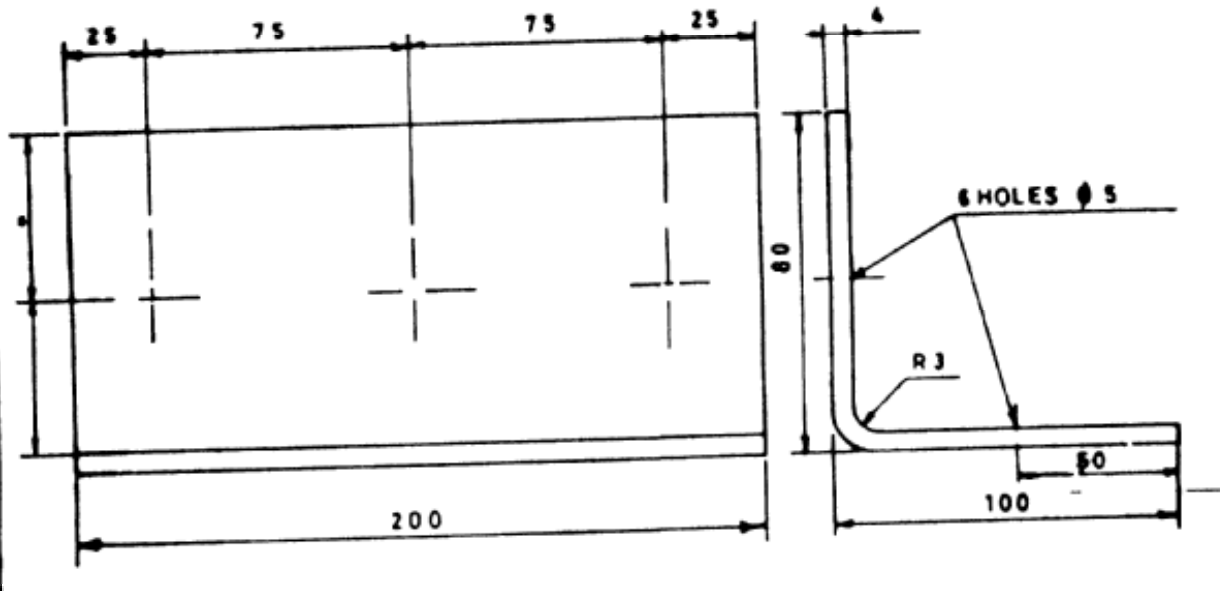
ANNEXURE I





SHIELDING PLATE  
(LIFTING ANGLE)

ANNEXURE-II







## AMENDMENT-NOTIFICATION

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### INSTRUCTIONS ON HANDLING, STORAGE, PRESERVATION, REPRESENTATION AND TRANSPORT OF EXPORT ORDER COMPONENTS AT WORKS AND SITES

1. In cl.1.1.1 in place of unloading read as loading/unloading.
2. In cl.1.1.1 (C) Delete “and C.G position”.

REF:	Amd.No.	APPROVED	ISSUED	DATE	CUM.Sr.No
	01	AGM (E & CC)	STDS. ENGG	OCT.93	0119



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## INSTRUCTIONS ON HANDLING STORAGE, PRESERVATION, REPRESENTATION AND TRANSPORT OF EXPORT ORDER COMPONENTS AT WORKS AND SITES

### 1.0 HANDLING:

#### 1.1 General:

1.1.1 Before unloading a packing case from the carrier look for the following shipping instructions painted on the packing case.

- a) Weight of the package.
- b) The markings showing the upright position.
- c) The markings showing the sling position and C.G. position.
- d) Markings showing the fragile contents.
- e) Marking showing type of storage required as per HY 0490564.

1.2 Appropriate cranes and slings should be used for different components/cases. Slings should normally make an angle as minimum as possible (width wise) but in no case more than 15°.

1.3 Handling and lifting should be done without jerks or impacts.

1.4 Immediately after receipt of the goods the packing should be examined all-round for any sign of damage. If necessary lift the cover or a number of boards of the case so as to make the contents visible. In the event of sealed packing being used the plastic sheeting should not be damaged. It is imperative that the packing material is restored in original condition after the inspection.

1.5 On receipt of the equipment is should be checked with the shipping list and missing or damage if any should be reported immediately.

It is important to arrange for immediate examination to determine the extent of the damage, the cause of the damage and , where applicable, the person or persons responsible for the damage. According to general practice when transporting by railway or by road vehicle the carrier concerned should be immediately called upon (within specified periods) for jointly establishing a statement of the damage. This is essential as a basis for a subsequent claim and possible damage report to the insurance company.

**Revisions:**

**Issued :**

**STANDARDS ENGINEERING  
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**Prepared:**

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**Date:**

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**DGM (E & CC)**

**DEC. , 89.**



1.6 Protective coating applied on machined surfaces should not be disturbed. The plastic covering should be put back carefully so that it prevents ingress of dust and moisture. Some packing may have vapour phase inhibitor (VPI) paper enclosed inside the packing cases. This should be restored to its original place as far as possible.

1.7 Silicagel and such other chemicals kept in the box as desiccants and indicators should also be left in the box itself.

## **2.0 STORAGE AND REPRESENTATION INSTRUCTIONS:**

2.1 Storage of different products and their components shall be as per HY0490564.

### **2.2 General Instructions:**

2.2.1 The ware house or the covered area where equipment is to be stored should be clean, dry and well ventilated. The platform and the store house should be built in conformity with the fire prevention rules and standards. It must be treated with pesticides/insecticides against white ants other insects, fungus etc. The stage premises should be kept rodent free as far as possible. Adequate gateway should be left for inspection and cleaning.

2.2.2 Immediately after receipt of the packing cases the condition of the desiccant shall be ascertained by examining the humidity indicator which are visible outside the packing case (see cl.6.0 of the standard) and take correct action as required. The packing cases should be periodically inspected specially after damp weather for fungus, dampness or any sign of deterioration of packing material. If desired the ware house should be suitably fumigated.

2.2.3 Periodic inspection at least once in three months should be carried out for all the components to ensure that the protective coating (preservation) etc. are intact and no damage has occurred to the equipment. If any damages are observed the same shall be repaired/ preserved immediately.

2.2.4 Pipes including lubricating oil pipes are supplied in cleaned, pickled, sprinkled with VCI powder inside and protected at ends. They should not be kept open to rain and inclement weather. It is recommended all pipes should be stored in suitable racks to facilitate access and easy handling. It must be ensured that ends of the pipes are properly blanked before storing to prevent ingress of dirt, dust and moisture.

NOTE: For steam turbine rotor preservation and representation refer Std. No. TC51761.



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2.2.5 Insulating materials sent loose before curing have definite shelf life. It is recommended not to send these materials such as epoxy resins, resin treated tapes bitumen varnishes etc. too early to site. Still there might be some occasion when these materials have to reach site early. These materials are usually sent in sealed tins with a label indicating shelf life. If these materials can not be used immediately these are to be stored preferably at a temperature not exceeding 5° C.

2.2.6 While opening the cases of such materials care should be taken not to push the tool too deep in the box.

2.2.7 When the case is to be reclosed for further storage after inspection, case should be taken to cover these items with polyethylene sheets fully, leaving no gaps. The desiccants such as silicagel have to be reactivated if necessary and restored in the packing.

2.2.8 Motors and windings in storage should be inspected and I.R. values checked at periodic intervals. The suggested intervals are once in two months in dry weather and monthly in humid weather. These readings should be preferably recorded in a log. Any significant drop in I.R. values should be reported immediately.

2.2.9 A few roles of VPI coated paper should always be kept at site for replacing spoiled or ineffective paper due to expiry of shelf life.

### 3.0 PRESERVATION:

3.1 Preservation of different products and their components shall be as per HY0490563.

3.2 For steam turbine component refer product Std. No. ST33004.

3.3 For preservation of components like stampings and punchings a special TRP "SPRAY PEEL" of M/s. PLASTIPEEL CHEMICAL, PLASTIC INDIA LIMITED, THANE may be adopted.

### 4.0 TAKING OUT OF STORAGE:

4.1 Remove any rust from painted area with a steel wire, brush or sand paper. Treated area must be bright and free from grease. Give them a new coat of primer and the requisite No. of finishing coats of paints.

The machined parts should be removed from their packings only just before they are required for installation. They should preferably be brought to the point of installation still packed and arranged in the sequence in which they are to be installed. Heavy parts should be secured against slipping or over turning.



## 5.0 TRANSPORT:

- 5.1 Greatest care and attention should be exercised when transporting the materials to the site. The means of transport must be suitable for the purpose with regard to weight, lifting and to the any marking with regard to permissible method of transport.

When loading and unloading particularly, heavy machine parts must removed with the aid of wrenches, jacks, crow bars and the like, the transport vehicle should be packed up with props and jacks to prevent subsidence or the tilting of the loading surface when the brakes are applied. The machine parts should be so secured that they can not move in transit. Steel ropes should be cushioned with wooden block to prevent any damage by rubbing.

- 5.2 Special methods if any for transporting for different product components shall be given in each product standard.

## 6.0 CHECKING AND REACTIVATION:

- 6.1 The moisture absorption capacity of the desiccant must be checked after completion of shipment, after interruption in transit involving a storage period of more than one month and during normal storage at the site. To do this use the moisture indicator inserted in the plastic sheeting cover at a distance of not less than 5 cm. from the sheeting. The moisture indicators are marked with their respective location and show the relative humidity inside the cover in three ranges (>30%, >40% and >50%). With the packing in dry condition all circles are blue. A change in colour to pink in the respective circle indicates the relative humidity in percent. As soon as the 40% indicator changes to the pink colour the desiccants must be removed and replaced or reactivated by drying.

Make sure that sufficient replacements, desiccants or the necessary drying facility for reactivation is available. After opening the plastic sheeting cover should be provisionally resealed, but shall not be left in sealed condition for more than 20 hours.

For reactivation of desiccant the pouches should be dried in a drying oven at a temperature of 110° C for 12 hours. If a drying oven is not available the desiccant should be removed from the pouch, spread out in a thin layer on a metal plate and dried at 110° C to 130° C for several hours until the weight of the desiccants remains constant. The desiccants should then be filled back into the pouches which are to be closed and reinstalled into the plastic sheeting cover as quickly as possible. Care should be taken to ensure that the pouches do not come in contact with metal parts. The opening in the plastic sheeting cover should then be resealed with a heat sealing unit.