

BHARAT HEAVY ELECTRICALS LIMITED
ELECTRONICS DIVISION
P.B.NO.2606, MYSORE ROAD
BANGALORE - 560 026

Tender Enquiry No.:

BHEL:EDN:SHP:PKG:2008-10:ENQ

Date: 02.01.2008

Sealed Tenders are invited from reputed Packing Contractors for Packing Work of the Products of the Company for a period of Two Years. The interested Contractors should have registered themselves with ESI and PF authorities. The successful Contractor is required to comply with the Provisions of Contract Labour (R&A) Act.1970 and Minimum Wages Act 1948 and other statutory regulations. The Packing Work will have to be done as per our Specifications, Terms and Conditions, using Contractors material, Labour and Tools etc.

Tender documents may be obtained from the office of Sr. Deputy General Manager (Shipping) at the above address on payment of Rs.500/- (Rupees Five Hundred only) by Cash. The Tender documents will be issued from **04.01.2008 to 25.01.2008** between 9.00 AM and 2.30 PM on Monday to Friday and from 9.00AM to 10.30AM on Saturdays.

Separate Sealed Tenders Superscripted "Technical bid for Packing of CE/SC&PV/Meter Products/and associated components" and "Price bid for Packing of CE/SC&PV/Meter Products/and associated components" need to be dropped in to the Tender box earmarked with all details which is kept at the reception up to **2.00 PM on 28.01.2008**.

The undersigned reserves the right to reject any or all Tenders without assigning any reason there-of.

SENIOR MANAGER-SHIPPING

BHARAT HEAVY ELECTRICALS LIMITED
ELECTRONICS DIVISION
MYSORE ROAD, P.B. NO.2606
BANGALORE - 560 026

NOTICE INVITING TENDER

1. TENDER ENQUIRY NO. : BHEL:EDN:SHP:PKG:2008-10:ENQ.
Dated 02.01.2008
2. NAME OF THE WORK : Rate Contract for Packing work
of the Products of CE,
semiconductor & Photovoltaic,
meter products and associated
components.
3. CONTRACT PERIOD : Two Years
4. EARNEST MONEY DEPOSIT : Rs.2,00,000/- (To be furnished
in the Form of Demand Draft).
(As per para 8.1.1 of Work Policy)
5. ISSUE OF TENDER : FROM 04.01.2008 TO 25.01.2008
6. LAST DATE AND TIME FOR
THE RECEIPT OF COMPLETED
TENDER : 28.01.2008 upto 14.00 Hours
7. DATE AND TIME FOR TENDER
OPENING : 28.01.2008 at 15.00 Hours
(Technical bid only)
Price bid will be opened for
Technically accepted bidders
on intimation at a later date.
8. TENDER VALUE : Rs. 950 Lakhs (Rupees nine fifty
lacs only)

The Tender Document contains : **159** sheets including this sheet.

For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED
ELECTRONICS DIVISION
BANGALORE-560 026

SR. MANAGER - SHIPPING

TENDER SPECIFICATION

- Part - I:**
- A) Technical Specification (Guidelines and Procedure) for Packing of Control Equipment Products, Semi-Conductor Devices (BHEL-EDN Plant Standard No.ED 049 00 99). Plant Standard enclosed. [[Annexure - A](#)]
 - B) Technical Specification (Guidelines and Procedure for Packing of Control Equipment using Plywood (BHEL-EDN Plant Standard No.ED 049 00 92). Plant Standard enclosed. [[Annexure - B](#)]
 - C) Other Technical Points.
 - D) Technical Specification for Packing of Materials in Corrugated kraft paper cartons. Product Standard enclosed. [[Annexure - C](#)]
 - E) Technical Specification for Packing of Materials in Corrugated Sun_pac PVC cartons. Specification enclosed. [[Annexure - D](#)]
- Part - II:**
- Technical Specification for Packing of Solar PV Modules.
- A) Scope of Work
 - B) Packing Specification & Procedure for Packing. Product Standard enclosed. [[Annexure - E](#)]
- Part - III:**
- A) General Terms and Conditions
 - B) Commercial Terms and Conditions
- Part - IV:**
- Technical Bid:
Questionnaire

Part - V:

Price Bid:

- A) Schedule of Rates for Control Equipment Products, Semiconductor Devices using Rubber wood / Silver oak wood .
- B) Schedule of Rates for Packing of Control Equipment Products using Plywood of grade Marine [IS: 710]/BWR Grade IS: 303 including commercial plywood. This consist of two parts, namely Part V 'B1' and Part V 'B2'
- C) Schedule of Rates for Packing of PV Modules in Cartons.
- D) Schedule of Rates for Packing of materials using corrugated kraft paper cartons.
- E) Schedule of Rates for Packing of materials using corrugated sun-pac cartons.
- F) Schedule of Rates for Packing consumables to be supplied by the Contractor

NOTE:

Part-I, II & III may be retained by the Tenderer. Part - IV & V should be filled in Original and submitted.

Separate sealed covers to be used for -

a) first part namely Part - IV - (Technical bid), Questionair, superscripting the cover with 'Technical Bid for Packing of CE products, SC&PV, Meter products and associated components', and

b) Second Part namely Part-V A, B, C, D, E & F respectively (Price Bid) superscripting the cover with 'Price Bid for Packing of CE,SC&PV, meter products and associated components'.

For any clarifications, please contact Sr. Manager-Shipping /Sr Engineer-Shipping at 080-26998711, 26998639 and 26742925.

PART - I 'C'

C. OTHER TECHNICAL POINTS

1.0 Quality of Materials

1.1 The Quality of materials used for Packing shall be as per I.S. Specification/BHEL Specification for each material. Each item (Eg: - Silica Gel, Kraft Paper etc.,) is subject to inspection and approval by BHEL before the same is used. Any disapproved / non-standard item identified by BHEL shall be removed by the Contractor at once.

1.2 Species of Wood & extent of Chemical treatment will be subject to random check at least ONCE in a year at any reputed Laboratories. The Contractor is bound by the reports of these Laboratories. The charges towards testing are to be borne by the contractor.

1.3 The Contractor shall submit a certificate confirming the quality of wood supplied by him and the Chemical treatment done is as per the Tender Specification along with the monthly bill for the quantity billed.

1.4 If, for any reason, Rubber Wood/Silver Oak Wood is not available on a particular occasion, other wood specified in IS-6662 Group-I & II considered equivalent to Rubber Wood/Silver Oak may be used with prior written permission from BHEL.

1.5 Handling of markings on the cases/panels have to be done by using templates/stickers and suitable indelible inks. These have to be provided by the contractor at their cost.

2.0 Calculation of Wood content for the purpose of payment.

For Calculation of Wood content for the purpose of payment BHEL will consider

2.1 [a] For Rubberwood and Silveroak wood, Length X Breadth X Thickness of FRONT, REAR, TWO SIDES & TOP PLANKS only will be calculated as bare volume, for panels without pallet. Pallet will be supplied by BHEL as part of Panel.

- 2.1 b] Length X Breadth X Thickness of bottom Pallet will be considered as bare volume if it is supplied by the Contractor.
- 2.1 [c] In case of loose items packed in boxes including bottom pallet, all six side planks/shookes will be considered for calculation of bare volume.
- 2.1 [d] The Volume of the following wood is also taken into consideration while calculating total wood content for the purpose of billing / payment, and 40 percentage of above said volume will be added to the bare volume [2.1(a), 2.1 (b) and 2.1 (c)] calculated as above. This means for calculation of total volume of wood content, 1.4 times of bare volume , [2.1(a), 2.1 (b) and 2.1 (c)] as referred above will be considered.
- i. Reinforcing battens
 - ii. Support battens
 - iii. Beams given to the bottom side / pallet and etc.
- 2.2 In case of Packing of Cubicles, Loose Items and Spares with plywood, as per PART-I 'B' of Tender Specification, Calculations will be based on Area of Front, Rear, 2 sides and Top Planks only. For this, Payment will be made based on Square Area as described in the Schedule of Rates under Part - V 'B'
- 2.2.1 Volume of additional reepers, supporting battens and reinforcing battens/beams will not be considered for payment of packing charges. Hence costs of these battens necessarily have to be included in the cost of main plywood area along with other packing materials. Separate charges or rates are not allowed since payment for plywood rates are based on square meter of plywood content i.e Total area of plywood used.
- 2.2.2 In case of bottom pallets supplied by the contractor, payment will be made on Area of wood content. The calculation is same as at 2.2.1
- 3.0 The Dust on the Loose Items & inside and outside the Cubicles shall be removed by the Contractor's workmen before Packing.

PART - I [D]

Technical Specification for Packing of Materials in Corrugated kraft paper cartons.

1.0 Scope:

The packing involves the following:

- 1.1 Meter Products - Packing with unit and Bulk cartoning.
- 1.2 CE products and its components
- 1.3 Panels

2.0 Specifications:

- 2.1 Meter Products:
 - 2.1.1 For Unit carton Packing:
Detailed details are furnished in the drawing nos: 3089 05 00098, 3680 05 00045, 3680 02 00113, 3680 05 00017. [Sample drawing enclosed]

Material: 3 / 5 Ply corrugated fibre board of deluxe virgin 100 gsm as per IS:2771 part - I
 - 2.1.2 For Bulk Cartoning:
Material: 7 ply 7 thick 120 gsm CFB Delux vergin kraft paper
Drawing ref no: 3 680 05 00114 (Sample Drawing enclosed)
 - 2.1.3 Detailed required drawings will be made available for packing of different types of meters well in advance.
- 2.2 CE Products and its Components:
Packing of Loose items, Spares and others items

Using 7 ply corrugated kraft paper non - virgin having 250 GSM with silica gel, polythene sheet, PVC strappings, markings, coir, and other required packing materials. Carton size and type will be informed well in advance to suit the materials to be packed.

2.3 Panels:

The specification for packing of panels using tri-wall corrugated kraft paper board or equivalent board made out of kraft paper with other packing materials such as edge board, polythene sheet, silica gel, document pouch, stickers, rotolock, PVC strappings and etc. For details please refer **Annexure C**

Depending upon the size of the panel, carton with all packing materials have to be organized for packing.

PART - I [E]

Technical Specification for Packing of Materials in SUNPAC Corrugated PVC cartons.

1.0 Scope:

The packing CE loose items, spares, PV items, short shipped items which are being sent thro RPP/Speedpost and courier services using sun-pac pvc carton with other packing materials such as polythene sheet, silica gel, PVC strapping markings and label stickers.

2.0 Specifications:

Detailed technical specification is furnished in **Annexure D**

Required size of cartons will be informed well in advance to meet the different requirements.

PART - II

TECHNICAL SPECIFICATION FOR PACKING OF SOLAR PV MODULES

- A) SCOPE OF WORK
- B) PACKING SPECIFICATION

A] SCOPE OF WORK:

The Packing involves the following:

1. Suitable assistance for shifting of materials to be packed from Production area to Packing area and arranging the same Customer-wise / rating-wise.
2. Writing module serial numbers in packing Notes / in additional sheet as enclosure to Packing Notes.
3. Packing as described in Part - II 'B' Packing Specification
4. Arranging the packed cartons neatly customer-wise.
5. In certain cases, PV modules will not be packed but will be sent in loose condition in Car, Tempo. In such cases loading will have to be done by the Contractor.
6. Except Packing Slip, all other packing materials including cartons have to be supplied by the contractor. These Packing materials will have to be approved by us for quality.

PART - II

B. PACKING SPECIFICATION:

Various types of Photovoltaic Modules shall be packed for dispatch to customers as per the following instructions.

The specifications for carton box & EP foam fitments for various configurations are as per document no: CD-4-4007-011 'INSTRUCTION FOR PACKING OF PV MODULES' Complete PV packing specifications are kept in a separate folder.

Complete packing instructions are given in the above document indicating the drawing numbers for sub-item such as Carton, EP foam fitment and others. In a matrix form all these details are furnished for various types of PV modules starting from 6 watts to 150 Watts and above.

Complete details are given in the **Annexure - E**

PART - III

GENERAL TERMS AND CONDITIONS

1. Packing work will have to be done in the premises of the Company. In some special cases, Packing will also be done at the premises of our Sister Unit like Electronic Systems Division, Hosur Road, Bangalore.
2. Cleanliness has to be maintained by the Contractor's workmen in the Packing/Dispatch Area. Scrap materials to be removed and Shop floor of Shipping Section to be kept clean at the end of each day. Cut Pieces / Scrap belonging to Contractors materials to be removed and taken back with necessary paper works after duly certified by concerned executive.
3. The Contractor shall employ sufficient number of workmen to execute the Packing work as and when the same is entrusted to him without any delay.
4. The Contractor shall employ a Full Time Supervisor to ensure proper supervision of the Packing Work.
5. Except where otherwise provided for in the contract all questions and disputes relating to the meaning of the Specifications, Designs, Drawings and Instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right., matter or thing whatsoever in anyway arising out of or relating to the Contract, Designs, Drawings, Specifications, estimates, Instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the sole arbitration of the General Manager of Bharat Heavy Electricals Limited., Electronics Division. And if the General Manager is unable or unwilling to act, to the

sole arbitration, some other person appointed by the General Manager willing to act as such arbitrator will be the Sole arbitrator. There will be no objection if the arbitrator so appointed is an employee of Bharat Heavy Electricals Limited, Electronics Division and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he had expressed views on all or any of the matter in dispute or difference. The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, such General Manager as aforesaid at the time of such transfer, vacation of office or inability to act, shall appoint another person to act as arbitrator in accordance with the terms of the contract. Such persons shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a terms of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

The work under the Contract shall if reasonably possible continue during the arbitration proceedings and no payment due or payable to the Contractor shall be with-held on account of such proceedings.

The arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the dates of the first hearing.

The arbitrator shall give a separate award in respect of each dispute or difference referred to him.

The venue of arbitration shall be such place as may be fixed by the arbitrator in his sole discretion.

The award of the arbitrator shall be final, conclusive and binding on all parties to this contract.

6. The Contractor shall comply with the provisions of the Workmen's Compensation Act 1923, the Payment of Wages Act 1936, the Factories Act 1948, Minimum Wages Act 1948, and Industrial Disputes Act 1947, and other Acts, Central or State, that may be applicable to him. He shall be liable to pay all such sum or sums, that

may become payable as contribution, compensation, penalty, fine or otherwise, which the Management of BHEL may be called upon to make under the provision of the said Acts, to or on behalf of any workmen employed by the Contractor by an authority empowered under the relevant Act. Any cost incurred by the Management of BHEL in connection with any claim or proceedings under the said Acts, or in respect of loss, injury or damage howsoever negligent on accounts of imperfect or improper performance of this contract by the Contractor, his workmen, servants or agents and any money which may become payable to the Management of BHEL as aforesaid shall be deemed to be money due under the terms of this contract may be deducted by the Management of BHEL from any money due or accruing to the Contractor by the Management of BHEL or may be recovered by the Management of BHEL from the Contractor in any other manner.

7. (i) The Contractor should take independent Code Nos. under EPF Act 1952 and ESI Act 1948 and shall cover his workmen under the Employees Provident Fund Scheme and Employees State Insurance Act 1948 and show proof of payment of the subscriptions / contributions to the concerned authorities.

(ii) As regards Employees State Insurance Act, the Contractor shall submit photostat copies of the challans of remittance of the contributions (both employees contributions and his own contribution thereon) to the ESI Corporation, in respect of the employees engaged in BHEL by him for this work for the relevant period, before any payment is released by BHEL. In case the Contractor fails to submit full details of his account of Labour employed and the contribution payable an amount of contribution as assessed by us will be recovered from the running bills of the contractor. The amount so recovered will be adjusted against the actual contribution payable to Employee's State Insurance.

(iii) As regards the Employee's Provident Fund and miscellaneous Provisions Act, 1952 and rules and regulations and schemes framed thereunder, he shall be liable to pay employees contributions and his own contribution under the Act in respect of all labour employed by him for the execution of the contract. For this purpose, he shall indicate the Code Number obtained by him from the Regional

Provident und commissioner and produce the Photostatic copy of the Challan receipt of Monthly remittance of the contributions made by him. Payments due to the contractor will be released only on production of a 'NO DUE CERTIFICATE' from the Regional Provident Fund Commissioner. He shall also furnish such returns as are due, under the Act, to be sent to the appropriate authorities through BHEL as the Principal Employer.

8. The BHEL General conditions of Contract (enclosed) shall also apply to this work, except to the extent modified in these conditions. The Contractor shall srutinise the GCC available in BHEL-EDN and acquaints himself with the provisions thereof, to his satisfaction.
9. Tenderers shall submit an upto date solvency Certificate from their Bankers (Scheduled Bank) and upto date Income Tax Clearance Certificate with their offers. The minimum acceptable value of solvency certificate is 25% of the contract value.
10. The Contractor shall follow such Acts, Rules and Regulations of the State & Central Government that are in force and that may be framed from time to time. BHEL shall be responsible for any infringement of the various statutes in force, by the Contractor.
11. The Contractor shall take, at his own cost, the necessary License in respect of his Trade/Business, in respect of this work. The expenses in completing the formalities in executing the agreement including expenses on Stamp Paper, will also be met by the Contractor.
12. The Management of BHEL shall have the right to withhold Payment of, or make recoveries from claims due to the in respect of any loss or damage caused or occasioned in respect of the properties of BHEL under the Terms and Conditions of this arrangement or any payments necessitated due to infringement of any statutory obligations, by the Contractor.
13. The Contractor shall not transfer or sublet the work to anyone without the prior written approval of BHEL. The Contractor shall, either by himself or through a competent Agent approved by BHEL Authorities, perform the said work.

14. The rates quoted are firm for the entire period of contract, and are inclusive of all Taxes, Duties, Statutory Levies, whether central or State and are not subject to any revision. However service tax amount on bill value will be reimbursed as per actuals paid by the contractor to the service tax department. Percentage of Service Tax on bill value prevailing on date of quotation has to be indicated. Any change in percentage of service tax will be recovered / paid by BHEL during the course of contract in case there is a revision.
15. Whenever under the Contract any sum of Money shall be recoverable from, or payable by the Contractor, the Contractor on demand shall pay the same. Such amount may also be deducted from any sum then due, or from any sum which at any time thereafter become due, to the Contractor under this Security Deposit, in respect of this work or in respect of any other work.
16. All the employees of the Contractor engaged for the work shall be paid by him their normal wages, for the four National Holidays and Public Holidays declared by BHEL for that Calendar year.

Failure to employ adequate number of persons resulting in dislocation of the work will be construed as breach of the terms and conditions under this agreement, and will entail termination of the Contract forthwith and re-arrangement of the work through other agencies, at the risk and cost of the Contractor.
17. Without prejudice to any rights or remedies under this Agreement if the Contractor dies, the BHEL authorities shall have the right to terminate this agreement with out any liability whatsoever as regards enlistment of the work for the balance Contract period after the death of the Contractor.
18. The Contractor shall pay Wages to his workmen at the Rates as applicable from time to time to the Engineering Industry under Minimum Wages Act. / equivalent Categories subject to variations in the cost of living allowance applicable to these

categories. The Contractor shall disburse the wages of his workmen for the preceeding Month between 7th & 10th of each Month in the presence of the Company's representatives at the work premises and obtain their signature in the payment register. In the event of non-payment, the Company reserves the right to withhold the payment against Bills of the Contractor that is due. Above minimum Wages is subject to variations every year effective from 1st April depending on the cost of living allowance.

19. The Contractor shall apply and obtain Licence under the Contract Labour (R&A) Act 1970, and comply with the relevant Provisions of this Act, in respect of the Labour employed by him for executing this Contract. The Contractor shall furnish necessary returns to the authority through the principle employer.
20. **Compliance with Labour Laws:-** BHEL shall, on any report having been made by an Inspecting Officer as defined in the Contractor's Labour Regulations, have the Power to deduct from the Moneys due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of workers, non-payment of wages or of deductions made from his or their wages which are not justified by the terms of the contract or non-observance of the said Contractor's Labour Regulations.

The Contractor shall indemnify BHEL against any payment to be made under and for observance of the Regulations aforesaid.

21. In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid contractor's Labour Regulations, as amended from time to time or furnishing any information or submitting or filling any Form / Register / Slip under the Provisions of these egulations which is materially incorrect, then, on the report of the Inspecting Officers as defined in the Contractors Labour Regulations, the Contractors shall, without prejudice to any other liability, pay to BHEL, a sum not exceeding 10% of contract value as liquidated damages for every default, or furnishing, making, submitting, filling materially incorrect statement as may be fixed by BHEL. Such amount will be deducted from the

running Bills/Security Deposit of the Contractor and the amount would be credited to the Welfare Fund constituted under Regulations.

22. **Model Rules for Labour Welfare:-**

The Contractor, at his own expense comply with or cause to be complied with Model Rules and Labour Welfare as appended to these conditions or rules framed by Government from time to time for the protection of Health of the Labourers. In case, the contractor fails to make arrangements as aforesaid BHEL will be entitled to do so and recover the cost thereof from the Contractor.

23. The Contractor should take full care regarding safety aspects. In case of any Accidents / Injuries to the Contractor's Labourers within the premises of the Company (BHEL), the Contractor is solely responsible and no claims whatsoever on the Company (BHEL) is permissible.

23.01 Successful tenderer is required to provide uniforms to their labourers who are working inside the factory premises at his own cost and details of which are furnished below:

a] Shirt and Pant - 2 pair per year and total 4 Pairs for Two years.

(Terricot Shirt - 2 Mtrs. x 2 nos. & Terricot Pant - 1.2 Mtrs.x 2 Nos. and applicable Stitching Charges per pair).
(Above amount indicated is tentative one)

b] Safety Shoes with Socks - One pair every year

[Model and make: IS 801 of M/s. Jee Pee Shoes Pvt.Ltd
Socks - 2 pairs: nylon cloth]

These shoes have to be preferably to be procured through BHEL approved vendors only.

Approximate Cost of 4 pairs of uniform and two pairs of shoes is indicatively works out to approximately Rs. 3000/- per labour for Two Years contract which will have to be considered while quoting the offer.

23.02 Successful tenderer should provide the following safety Personal Protective items to his labourers during working period and shall ensure safe working habits and safe working conditions. All these expenditures have to be borne by the tenderer only. BHEL will not reimburse the same.

S1. Personal Protective. Eqpt. - qty:
No. /Items

1.	Safety spectacle	- 1 no	
2.	Ear Muff	- 1 no	Makes & Specifi-
3.	Ear Plug	- 1 set	cation as per
4.	Dust Mist respirator	- 1 no	enclosed Sheet.
5.	Hand gloves	- 1 pair	
6.	Soap	- 1 no per month	

Indicated approximate cost of these safety items excluding Shoes will be approx. Rs.560/-.

All these items have to be procured through BHEL approved vendors only details of which will be given at later date. Specifications for Uniform and Safety appliances are given **at 23.03**

23.03 Specifications for Uniforms and Safety appliances

A) Uniform:-

Quality of Cloth	~	67% polyester & 33% Cotton
Quantity	~	One set of consisting of 1.2M Pant cloth, 2.0M shirting cloth.
Stitching charges	~	Rs.150 per set
Colour	~	As per the instruction of Executive In-charge.

B) Safety Shoe with socks:-

Shoes	~	Model/Make: IS.801 of M/s Jee Pee shoes Pvt. Ltd. Socks shall be of nylon cloth
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C) Acid & Alkali Proof hand gloves:-

PVC hand gloves, Acid/Alkali Proof for Heavy duty, cotton lining inside, better grip, Yellow colour,-16 inches size.

D) Respiratory Mask (for dust):-

"Fenus" make: Model V-40 with double valve

E) Over Coats:-

"Binny" Polyester over Coats,

Erul Steel grey colour

67% Polyester + 33% Cotton

Size:- Shoulder :20 inch/22 inch

Chest:- 40inch/48inch

With 3 pockets (two pockets at bottom and one at top on left side chest)

F) Gum boots:-

Acid & Alkali proof

Non-glassed with lining

With steel toe

Full covered

Make: Duck back

G) Cotton Hand gloves:-

Size: 16 inch

Universal

Khaki drill "Binny"

Double stitch

H) Ear Plugs:-

Corded, Make; Birla 3 M

Model 1110

I) Respiratory Mask (Chemical mist)

Make : Venus

Model : V-29

J) Spectacle Goggle:-

Zero Power

Two sides covered with mesh

K) Soap:-

Make : Life Buoy

weight : 125 grams

24. The Packing work shall normally be done between 7.30AM and 4.30PM on working days. However, the same shall be done beyond normal working hours and on holidays also whenever the work load is temporarily increased. No extra charges are payable by the company for working beyond normal working hours / on holidays.
25. The Contractor shall be equipped to pack at least 4 Cubic Metres of Wood content or equivalent to 10 Cubicles of Control Equipment Products per day.
26. In case there is any delay in completion of the job as referred at (25) above, Company will be at liberty to levy penalty on the Contractor at the rate of 0.01% of the total value of equipment to be packed per day of delay subject to a maximum of 1%.
27. The Company does not give any Guarantee on minimum work load during the Day / Month / Year. The workload varies within the Month and within the year.
28. In case of emergency, if the Contractor fails to do the Packing work within the stipulated time, the same will be got done elsewhere / through others. Penalty may be levied on the Contractor as at (26) above.
29. In case it is found that the species of Wood/ASCU treatment do not conform to the Specification (Please see Clause 2.1 and 2.4 of Part-I), Penalty not exceeding 10% of the value of that Month's bill for Control Equipments will be levied and deducted from the monthly bill.

In addition, the Company (BHEL) will have the option to terminate the Contract.
30. The Contractor and his workmen shall abide by the Rules relating to maintenance of discipline and Security checks of the Company.
31. All Tools, Equipments, required for Packing shall be supplied by the Contractor which will be returned after closure of the contract duration.

32. Packing of Small Boxes for R.P.P. Airfreight, Personal Carry is normally done by the Company's Staff. However in case of emergency, the Contractor's Workmen shall do this work using Company's materials.
33. If any Packing material individually is required, the Contractor shall supply these at rates offered as per Schedule 'F' of Part - V -Rate Schedule

Ex:- Cubicles are normally covered by one Polythene cover. If, in some cases, Double covering has to be done, the extra cost of Second cover will be paid to the Contractor.

All Tools, Equipments and Materials brought by the contractor shall be entered in the Register kept in the Security Department.

BHEL reserves the right to split the Contract and Award the Contract to more than one Party in accordance with the Policy of the Company. Negotiations, if required, will be carried out on the L1 rate of each item quoted. If required BHEL will start negotiation with the party who has quoted overall L1 & then counter offer the negotiated L1 rates of each item to other parties from L2,L3,L4 etc., to have more than one contractor, at the same rates, at our disposal for smooth operation.

The Packing work entrusted to each contractor depends on the following criteria in addition to the above:

- (i) The Number of Workmen employed.
- (ii) Stock of Packing Materials supplied and kept by the Contractor at any point of time.
- (iii) Performance of the Contractor and
- (iv) Readiness of the Contractor to take-up the job at short notice and to meet our monthly schedule that will be issued periodically.

PART - IV 'B'

B. COMMERCIAL TERMS AND CONDITIONS

1. The Tenderer has to indicate his rates both in words and figures in the Schedule of Prices (Part-V) attached. In case of discrepancy between the rates indicated in words and the same indicated in figures, the lowest of the two will be reckoned and binding. Tendered has to offer the rates for the Contract duration of **Two** years.

2. **TAXES:** As per clause 14 indicated in Part III .ie 'General Terms and Conditions' given above.

3. The duration of the Contract will be for **Two** Years.

4. EARNEST MONEY DEPOSIT

a] The Tenderer shall furnish Earnest Money Deposit of Rs. 2,00,000/- (Rupees Two Lakhs only) towards all materials/ Products Packing. (This is as per Para 8.1 of Work Policy - extract of the same is furnished at para [c]).

b] Tenderer shall furnish Earnest Money Deposit in the Form of Bank Demand Draft in favour of BHARAT HEAVY ELECTRICALS LTD., ELECTRONICS DIVISION. This Demand Draft shall be submitted alongwith the Tender Offer: i.e. Questionnaire - Part-IV. Offers not accompanied by EMD will be rejected.

The EMD given by unsuccessful Tenderers will be returned after the Tender is finalised. EMD amount shall not carry any interest.

c] Extract of EMD details as per works policy called at para 8.1

8.1 Earnest Money Deposit (EMD)

8.1.1. Earnest Money is to be paid by each tenderer to ensure that the tenderer does not refuse to execute the work after it is awarded to him. The rate of earnest money deposit shall be as under:

Works costing upto Rs. 1 lakh	Nil
Works costing more than Rs.1 lakh and upto Rs.5 lakhs	Rs. 10,000/-
Works costing more than Rs.5 lakhs and upto Rs.10 lakhs	Rs. 25,000/-
Works costing more than Rs.10 lakhs and upto Rs.50 lakhs	Rs. 1,00,000/-
Works costing more than Rs.50 lakhs and upto Rs.100 lakhs	Rs. 1,50,000/-
Works costing more than Rs.100 lakhs	Rs. 2,00,000/-

For all Capital Works costing more than Rs.100 lakhs maximum EMD will be Rs. 2 lakhs.

One time EMD will also be Rs. 2 lakhs.

For SAS jobs and other smaller / routine type of jobs such as maintenance / servicing etc., the maximum value of EMD as well as one time EMD will be Rs.1,00,000/-.

EMD is to be collected in cash (as permissible under Income Tax Act), Pay Order or Demand Draft only.

However,

- (i) the EMD may be waived in exceptional cases for reasons to be recorded and approved by the Unit Head not below the rank of GM.
- (ii) One time EMD (lumpsum amount) for exemption from payment of EMD with each tender may be permitted by next higher authority not below the rank of AGM limited to Unit Head.

8.1.2 **EMD** by the Tenderer will be forfeited as per Tender Documents, if

- i) After opening the tender, the tenderer revokes his tender within the validity period or increase his earlier quoted rates.

- ii) The tenderer does not commence the work within the period as per LOI / Contract. In case the LOI / contract is silent in this regard when within 15 days after award of contract.
- 8.1.3 EMD given by all unsuccessful tenderers shall be refunded normally within fifteen days of acceptance of award of work by the successful tenderer.
- 8.1.4 EMD shall not carry any interest.

5. SECURITY DEPOSIT

a] Successful Tenderer will have to furnish Security deposit of Rs.1 Lakh to Rs.4 Lakhs as per Para 8.2.1 of Works Policy the extract of the same is indicated at para [c]. This amount will be decided based on the work load being given to each of the successful tenderer after Award of Contractor. This value is only a indicative one.

B] The Security Deposit may be furnished in the form of Cash/ Bank Draft / Bank Guarantee immediately after the award of the Contract. Earnest Money Deposit already received would be returned on receipt of Security Deposit as above. The Security Deposit will be released / returned after the successful completion of the Contract. The Security Deposit shall not bear interest. This Security Deposit will be forfeited and credited to BHEL in the event of breach of any of the Terms and Conditions of the Contract by the Contractor.

C] Extract of Security Deposit details as per works policy called at para 8.2

8.2 SECURITY DEPOSIT

8.2.1 Security Deposit should be collected from the successful tenderer. The rate of Security Deposit will be as below:

Upto Rs.10 Lakhs	- 10%
Above Rs.10 Lakhs upto Rs.50 Lakhs	- 1 Lakh + 7.5% of the amount exceeding Rs.10 Lakhs.
Above Rs.50 Lakhs	- Rs. 4 Lakhs + 5% of the amount exceeding Rs.50 Lakhs.

The Security Deposit should be collected before start of the work by the contractor.

8.2.2. Security Deposit may be furnished in any one of the following forms.

- i) Cash (as permissible under the Income Tax Act)
- ii) Pay Order, Demand Draft in favour of BHEL
- iii) Local Cheques of Scheduled Banks, subject to realization
- iv) Securities available from Post Offices such as National Savings Certificates, Kisan Vikas Patra etc., (Certificates should be held in the name of Contractor furnishing the Security and duly pledged in favour of BHEL and discharged on the back)
- v) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act subject to a maximum of 50% of the total Security Deposit value. The balance 50% has to be remitted either by cash or in other form of Security. The Bank Guarantee format should have the approval of BHEL.
- vi) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractors, A/c BHEL, duly discharged on the back.
- vii) Security Deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.
- viii) EMD of the successful tenderer shall be converted and adjusted against the Security Deposit.
- ix) The Security Deposit shall not carry any interest.

NOTE : Acceptance of Security Deposit against Sl.No. (iv) and (vi) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.

8.2.3. Security Deposit shall not be refunded to the contractor except in accordance with the terms of the contract.

8.2.4. The Head of Unit may waive the **Security Deposit** in respect of **Public Sector Undertakings**, particularly on a reciprocal basis.

6. TERMS OF PAYMENT:

The Contractor shall submit his bill once in a Month and payment will be made within 30 days of receipt of the bill. However submission of bills twice in a Month can be considered in special cases at the discretion of Management of BHEL-EDN.

7. The Tenderer who are not adhering to BHEL's Terms of Payment is likely to be rejected. All statutory deductions under Income Tax Act., works contract Act.or any other Law will be deducted by the BHEL as per rate in force.

The Company is not bound to accept the lowest Tender and decision of the Management of the Company is final. Noreasons, whatsoever will be given by the Company for not accepting the offer of any Tenderer.

8. The Company may short close / cancel the Contract if the Performance of the Contractor is found unsatisfactory.

9. The Tender shall be kept valid for acceptance by BHEL upto April 2008. Tenderers will not be allowed to alter the Prices during the validity period.

10. The Offers shall be submitted in 2 sealed covers in 2 Parts-I, II as detailed below so as to reach not later than 2:00 PM of 28.01.2008 to be dropped in a special Tender Box marked with 'Tender for Packing' which is kept at Reception.

PART-I: Tenderer Data (Technical bid)

Questionnaire - Data to be filled in by the Tenderer i.e., Part-IV with all relevant documents and sealed in cover superscribing as **"TENDER FOR PACKING PART- IV - Questionnaire - Technical bid"** and required to be dropped in the Tender Box.

PART-II: (Price bid)

Schedule of Rates for Control Equipment Products. i.e., Part-V, 'A', 'B', 'C', 'D', 'E' & 'F' duly filled in and sealed in a cover duly superscribing "TENDER FOR PACKING OF CONTROL EQPT Products, SC&PV, METER PRODUCTS AND ASSOCIATED COMPONENTS [Part-V - A, B, C, D, E & F Schedule of Rates - Price bid".

Late Offers/Telegraphic Offers/Telex Offers/offers received late will not be considered.

Note: Tenderer who has taken single DD towards Earnest Money Deposit covering both the contracts, is required to indicate the details of bank draft with amount taken in PART- IV.

11. The Tenders will be opened on 28.01.2008 at 15.00 Hours in Shipping (Despatch) Department in the presence of such of those bidders who wish to be present. The representative shall bring an authority letter from the Proprietor/Director of the Tendering Firm authorising him to represent the firm in the Tender Opening.

PART - IV

QUESTIONNAIRE

A. DATA TO BE FILLED BY THE TENDERER

1. Name in Full under which :
the Tenderer is trading
2. Address of the Official :
premises
 - a) Office
 - b) Works
3. Telephone No.
 - a) Office
 - b) Works
 - c) Residence of Partner / Proprietor / Director
4. Registered as: Public Limited Company/Private Limited
Company / Proprietary Company
(Strike whichever is not applicable)
5. Names & Address of : i)
Partners/Directors ii)
iii)
iv)
6. Details of Saw Mill
 - a) Is the plot on which Saw :
Mill is situated owned /
leased by you.

(Please enclose supporting
Document)

- b) Are the Materials and Machinery & Building Insured against Fire etc. (Please enclose copy of Insurance Certificate) :
- c) Area of the Plot :
- d) Size of the Building :
- e) Details of Machines :
Please give, Description
make, Sl.No.& Year of
Manufacture
- i)
 - ii)
 - iii)
 - iv)
 - v)
 - vi)
- f) No. of Labourers employed at the Mill.
- g) No.of Labourers available to be posted at BHEL-EDN for Packing works.
- h) Since how long are you running the said Mill.
7. Have you obtained permission? from Karnataka Forest Dept. to run the Saw Mill.
(Alternatively have you got No Objection Certificate from Karnataka Forest Department to run the Saw Mill.
(Please enclose copy of permission / N O C)

8. Please furnish the following:
Registration Nos. (Copies of certificates to be necessarily enclosed)
- a) K S T Registration No. :
 - b) C S T Registration No. :
 - c) Shops & Establishment Act
Registration No.
 - d) Forest Licence No. :
 - e] Service Tax Registration No:
9. a) Has your Firm been assessed:
from Sales Tax Authorities ?
(Please enclose Sales Tax
Assessment Certificate up
to 31.03.2007) for a period
of 3 years.
- b) Has your Firm been assessed:
from Income Tax Authorities?
(Please enclose Income Tax
Assessment Certificate upto
31.03.2007) for a period of 3 years.
10. Does your firm have Independent Code Nos. in respect of
following and if yes, mention the same.
- a) Employees State Insurance Act 1948 (ESI) :
Yes/No
-Code No.
 - b) Employees Provident Fund Act 1952 (EPF) :
Yes/No
-Code No.
11. Banker's Name & Address :

12. a) Your average Annual Financial "Turn Over" during the last 5 years in the similar lines of Packing.
13. a) Experience of having :
successfully completed /
undertaken similar works
during previous Years start-
ing from 2000 or later
- b) Names of Clients to whom :
- i) Packing Cases are being
supplied by you.
- ii) Packing work is being :
done by you.
(Please enclose copies of
Purchase Orders).

14. Earnest Money Deposit DD details:

- a] Bank Draft No. and date :
- b] Banker Name :
- c] Amount taken : Rs. 2,00,000/- []

Please enclose the copies of Registration Certificates for the above.

a. Please give the details of documents enclosed to your Offer :-

- i)
ii)
iii)
iv)
v)
vi)
vii)
viii)
ix)
x)
xi)
xii)

I/We hereby Certify that to the best of my/our knowledge, the particulars furnished above are true. It is understood that the information furnished will be treated as confidential and will not be divulged to unauthorised persons.

I/We also agree to the General Terms and Conditions & Commercial Terms and Conditions as shown at Part-IV A of this Tender Notification.

I/We also agree to keep the validity of our Quotation for acceptance up to 10.04.2008.

I/We also agree not to increase our quoted rates if called for negotiations.

Date:

Signature of the Tenderer

Place:

NAME:

DESIGNATION:

PART - V

[A] Schedule of Rates for Control Equipment Products,
Semiconductor Devices using Rubber wood/Silver oak wood.

Part V 'A'

SI No	Type of Packing	Unit	Rate for two years	Total Quantity Estimated for Two years	Total Cost
1	Packing of Cubicles with Rubber Wood as described at 3.1 of Part - I 'A' of Tender Specification	Cubic Metre		2,100	
2	Packing of Cubicles with Silver Oak as described at 3.2 of Part-I 'A' of Tender Specification	- do -		225	
3	Packing of Empty Cubicles / Cubicles with Rubber Wood as described at 3.3 of Part-I 'A' of Tender Specification	- do -		40	
4	Packing of Lose Items with Rubber Wood As described at 3.4 of Part-I 'A' of Tender Specification	- do -		350	
5	Packing of Loose Items with Silver Oak as described at 3.5 of Part-I 'A' of Tender Specification	- do -		35	
6	Packing of Photovoltaic Panels etc., as described at 3.6 of Part-I 'A' of Tender Specification	- do -		25	
7	Supply of Rubber Wood Pallets for empty Cubicles as described at 3.8 of Part-I 'A' of Tender Specification	- do -		35	
8	Packing with Bitumen Coated Hessein Cloth etc., as described at 3.7 of Part-I 'A' of Tender Specification	Square Metre		900	
9	Supply of Rubber Wood Pallets (Tongue & Groove ASCU Treated with Tarfelt & Polythene Covered) as described at 3.8 of Tender Specification	Cubic Metre		100	
10	Packing of Semi-Conductor Devices and other items with Plywood Boxes as described at 3.9 of Part-I 'A' (Labour Charges only) of Tender Specification	Square Metre		960	
	Sub – Total for Part V 'A'				

- Note:-
- 1) For the purpose of Payment, Wood content will be calculated as described at C-(2.1) of Part-I.
 - 2) The Rates quoted should include cost of all Packing Materials required as per BHEL-EDN Specification and Labour and as indicated in para 2.1 of PART - I C.
 - 3) Loose items (Sl.No.4 & 5) has to be packed using Pallet also. In such cases, payment will be calculated as per Rate Quoted for Sl.No.9.

PART - V [B]

B1] Schedule of Rates for packing of Control Eqpt. products using Non-Commercial Plywood

Part - V 'B1'

SI No	Type of Packing	Unit	Rate for two years	Total Quantity Estimated for Two years	Total Cost
1	Packing of Cubicles with Plywood as described under 6.0 to 6.1.8 of Part-I 'B' using	Unit Square Metre of Plywood Sheet Content			
	a) 9 mm Plywood			1200	
	b) 12 mm Plywood			1500	
2	Packing of Cubicles with Plywood for Exports as described at 6.2 of Part - I 'B' using	do -			
	a) 12 mm Plywood			450	
	b) 19 mm Plywood			250	
3	Packing of Empty Cubicle with Ply wood as described under 6.3 of Part-I 'B' using	do -			
	a) 9 mm Plywood			50	
	b) 12 mm Plywood			50	
4	Packing of Loose Items / Spares for inland Contracts as described under 6.4 to 6.4.3 of Part-I 'B' Using	do -			
	a) 9 mm Plywood			400	
	b) 12 mm Plywood			400	
5	do - as described under 6.5 of Part-I "B" for Export Contracts	do -			
	a) 9 mm Plywood			100	
	b) 12 mm Plywood			400	
Sub - Total for Part V 'B1'					

Note:- 1) For the purpose of Payment, Wood content will be calculated as described at para (2.2) of Part-I.C

2) The Rates quoted should include cost of all Packing Materials required as per BHEL-EDN Specification and Labour and as indicated at para 2.2 of PART - I C

3] In case bottom pallets supplied by the contractor, payment will be made on Area of wood content.

B2] Schedule of Rates for Packing of Materials using Commercial Grade Plywood

Part – V ‘B2’

SI No	Type of Packing	Unit	Rate for for Two years	Estimated Quantity for for Two years	Total Cost
1	Packing of Devices, Repair Modules , Manuals, Solar Cells and all other small size items suitable for AIRFREIGHT, Courier Service using 12 mm Thick Commercial Plywood as per IS 303-MR Grade type AA general purpose, Rubber Wood supporting batten of suitable cross section with other following pkg materials: Silicagel, Polythene Cover, ½” Size MS Hoop Iron Straps / PVC strappings, name plate, name plate holder and markings.	Per Square Metre		500	
2	do - using 12 mm Thick Commercial Plywood for sides and 6 mm Thick Commercial Plywood for Top and Bottom with all other Packing Materials including Bitumen kraft Paper covering using Gum	Per Square Metre		500	
3	do – using 6 mm Thick Commercial Plywood for all sides with all other Packing Materials.	Per Square Metre		500	
4	Packing of Devices, Repair Modules, Manuals, Solar Cells and all other small size items suitable for Speedpost using 12 mm Thick Commercial Plywood [MR Grade] general purpose with other following pkg materials: Silicagel, Polythene Cover for items, PVC strappings and markings. [No rubber wood supporting battens]	Per Square Metre		500	
5	Packing of Solar cells (already packed in Cartons by BHEL) suitable for RPP, VPP, Airfreight Courier Service using 12 mm Thick Commercial Plywood as per IS:303 - (MR grade). Rubber Wood supporting batten of cross section 20mm x 50mm with tolerance of plus or minus 2 mm including all other pkg matrls such as Polythene cover, name plate, pkg note holder, ms strappings and markings.	Per Square Metre		500	

6	Packing of solar cells (already packed in Cartons by BHEL) suitable for export consignment using 12 mm Thick commercial plywood as per IS:710 and as per Plant Standard ED 04900092. Rubber wood supporting batten of cross section 20 mm x 50 mm with tolerance of plus or minus 2 mm. including all other pkg matrls such as Polythene cover, name plate, including all other pkg matrls such as Polythene cover, name plate, pkg note holder, ms strappings and markings.	Per Square Metre		500	
7	Packing of PV Modules (already packed in cartons) suitable for RPP, VPP, Air freight/Export consignments using 12 mm thick Commercial Plywood as per IS:303 - BWR/BWP Grade (other packing instructions as per plant standard ED 049 0092 including all other pkg matrls such as Polythene cover, name plate, pkg note holder, ms strappings & markings)	Per Square Metre		500	
8	Packing of PV Modules suitable for RPP, VPP, AIRFREIGHT, Courier Service using using 12 mm thick Commercial Plywood – Moisture Resistance [MR] grade type AA general purpose, Rubber Wood supporting batten of suitable cross section, Polythene Cover, 1/2" Size MS Hoop Iron Straps, name plate, pkg note holder & markings.	Per Square Metre		200	
9	Labour charges for packing of materials in commercial plywood using all other materials except plywood. Plywood will be supplied by BHEL..	Per Square Metre		1,000	
10	Packing of Cubicles with Commercial Plywood [moisture resistance] equivalent to IS:303 and other details are as described under 6.0 to 6.1.8 of Part-I 'B' using	Unit Square Metre of Plywood Sheet Content			
	a) 9 mm thick Comml Plywood			3,500	
	b) 12 mm thick Comml Plywood			3,500	
11	Packing of Loose Items / Spares for inland Contracts with commercial plywood [MR] moisture grade equivalent to IS:303 and other details are as as described under 6.4 to 6.4.3 of Part-I 'B' using	Unit Square Metre of Plywood Sheet Content			
	a) 9 mm thick comml Plywood			1,000	
	b) 12 mm thick commercial Plywood			1,100	
Sub-Total for Part V 'B2'					

Special Note:

Materials: Commercial plywood [moisture resistance] MR grade general purpose instead of IS: 303 BWR as indicated in document ED 0490092 at 3.1.1.1 and all other parameters are remains unaltered.

Note:- 1) For the purpose of Payment, Wood content will be calculated as described at C-(2.2) of Part-I.

Part - V C

Schedule of Rates for Packing of PV Modules in Cartons

Part – V ‘C’

SI No	Type of Packing				Unit	Rate for for Two years e	Total Quantity Estimated for Two years	Total Cost
1.1	Module Type	L0606			Per Carton		100	
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	269*285*22	5	PS-439-055	PS-439-051				
	Packing of 6 Watts PV Modules							
	(5 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec.Nos.							
CD-4-4007-011								
1.2	Module Type	L0606			Per Carton		100	
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	269*285*22	10	PS-439-053	PS-439-050				
	Packing of 6 Watts PV Modules							
	(10 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.							
CD-4-4007-011								
1.3	Module Type	L1210 (12V,10W)			Per Carton		200	
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	464*285*22	10	PS-438-689	PS-438-688				
	Packing of 10 Watts PV Modules							
	(10 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.							
PS-438-688, PS-438-689 & CD-4-4007-011								

1.4	Module Type	L1218 (12V,18W))			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	644*285*22	5	PS-439-047	PS-439-036				
	Packing of 18 Watts PV Modules							
	(5 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							
1.5	Module Type	L1218 (12V,18W))			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	644*285*22	10	PS-439-045	PS-439-034				
	Packing of 18 Watts PV Modules							
	(10 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							
1.6	Module Type	L1235 (12V,35W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	678*528*38.5	2	PS-439-043	PS-439-033				
	Packing of 35 Watts PV Modules							
	(2 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							

1.7	Module Type	L1235 (12V,35W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	678*528*38.5	4	PS-439-041	PS-439-032				
	Packing of 35 Watts PV Modules							
	(4 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.							
CD-4-4007-011						100		
1.8	Module Type	L1235 (12V,35W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	678*528*38.5	5	PS-439-039	PS-439-031				
	Packing of 35 Watts PV Modules							
	(5 in One) in 5 Ply 250 GSM Corrugated Carton with 4 Nos. Foam fitments, individual Polythene Sheet Cover 700 Gauge for modules, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec .Nos.:							
CD-4-4007-011						400		
1.9	Module Type	L1250 (12V,50W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	873*528*38.5	2	PS-439-044	PS-439-033				
	Packing of 50 Watts PV Modules							
	(2 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec.Nos.							
CD-4-4007-011						100		

1.10	Module Type	L1250 (12V,50W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	873*528*38.5	4	PS-439-042	PS-439-032				
	Packing of 50 Watts PV Modules							
	(4 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos. :							
CD-4-4007-011						100		
1.11	Module Type	L1250 (12V,50W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	873*528*38.5	5	PS-439-040	PS-439-031				
	Packing of 50 Watts PV Modules							
	(5 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
CD-4-4007-011						200		
1.12	Module Type	L1270 (12V,70W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1203*528*38.5	2	PS-439-048	PS-439-037				
	Packing of 70 Watts PV Modules							
	(2 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
CD-4-4007-011						200		

1.13	Module Type	L1270 (12V,70W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1203*528*38.5	3	PS-439-058	PS-439-057				
	Packing of 70 Watts PV Modules							
	(3 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos. :							
	CD-4-4007-011							
1.14	Module Type	L1270 (12V,70W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1203*528*38.5	4	PS-439-014	PS-439-013				
	Packing of 70 Watts PV Modules							
	(4 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							
1.15	Module Type	L1270 (12V,70W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1203*528*38.5	5	PS-438-682	PS-438-681				
	Packing of 70 Watts PV Modules							
	(5 in One) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							

1.16	Module Type	L24100 (24V,100W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1144*789*50	2	PS-439-049	PS-439-038				
	Packing of 100 Watts PV Modules							
	(2 in 1) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							
						200		
1.17	Module Type	L24100 (24V,100W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1144*789*50	4	PS-439-025	PS-439-026				
	Packing of 100 Watts PV Modules							
	(4 in 1) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							
						100		
1.18	Module Type	L24120 (24V,120W)			Per Carton			
	Module Size[mm]	qty	Spec for carton	Spec for EP foam fitments				
	1309*789*50	2	PS-439-029	PS-439-030				
	Packing of 120 Watts PV Modules							
	(2 in 1) in 5 Ply 250 GSM Corrugated Carton with EP Foam fitments, individual Polythene Sheet Cover 700 Gauge, BOPP Adhesive Tape, Additional outer polythene cover for carton, PVC Straps, marking (inclusive of Labour Charges + all Materials Cost)							
	applicable Spec. Nos.:							
	CD-4-4007-011							
						500		

1.21	Re-Packing of PV Modules as per document . CD-4-4007-011 using all packing materials except carton and EP Foam fitments. Carton and EP foam fitments will be supplied by BHEL.		Per Carton			
	Sub-sl.no.	Type of PV Module [Watts]		Qty per carton		
	1	10		5 in 1		
	2	10		10 in 1		
	3	18		5 in 1		100
	4	18		10 in 1		100
	5	35		5 in 1		50
	6	35		10 in 1		50
	7	70		2 in 1		50
	8	70		3 in 1		100
	9	70		4 in 1		100
	10	70		5 in 1		100
	11	100		2 in 1		100
	12	100		4 in 1		50
	13	120		2 in 1		50
14	150	2 in 1		50		
Sub-Total for Part V 'C'						

PART - V [D]

SCHEDULE OF RATES FOR PACKING OF MATERIALS USING CORRUGATED KRAFT PAPER CARTON

PART -V 'D'

SI No	Type of Packing	Unit	Unit rate-Rs	Total Quantity Estimated for Two years	Total Cost
1	Supply & Packing charges of unit CFB cartons for meters	Per carton			
	[a] for volume upto 4600 Kilo Cubic mm			1,000	
	[b] for Volume upto 6100 Kilo Cubic mm			1,000	
	[c] for Volume upto 7600 Kilo Cubic mm			1,000	
	[d] for Vol. upto 8800 Kilo Cubic mm			2,000	
	[e] for Vol. upto 11150 Kilo Cubic mm			2,000	
	[f] for Vol. upto 13500 Kilo Cubic mm			3,000	
2	Bulk CFB Cartoning Supply & Packing Charges for meters :	Per carton			
	[a] for Volume upto 66,000 Kilo Cubic mm			500	
	[b] for Vol. upto 80,000 Kilo Cubic mm			500	
	[c] for Vol. upto 94,000 Kilo Cubic mm			1,000	
	[d] Labour Charges for bulk carton Packing			2,000	
	[e] Labour Charges for bulk cartoning-Repacking			2,000	

3	Packing of CE materials using 7 ply, 250 GSM non vergin corrugated kraft paper carton with all packing materials including polythene cover , silicagel, PVC strappings, markings and suitable cushioning materials in the following sizes:.	Per carton				
			[a] For Volume upto 20,000 Kilo Cubic mm		200	
			[b] For Vol. Upto 40,000 Kilo Cubic mm		250	
			[c] For Vol. upto 60,000 Kilo Cubic mm		150	
			[d] For vol upto 80,000 Kilo Cubic mm		200	
			[e] For vol upto 100,000 Kilo Cubic mm		250	
			[f] For vol upto 120,000 Kilo Cubic mm		250	
			[g] For vol upto 150,000 Kilo Cubic mm		200	
			[h] For vol upto 180,000 Kilo Cubic mm		250	
			[i] For vol upto 200,000 Kilo Cubic mm		150	
			[j] For vol upto 230,000 Kilo Cubic mm		150	
			[k] For vol upto 260,000 Kilo Cubic mm		200	
			[l] For vol upto 300,000 Kilo Cubic mm		150	
			[m] For every additional vol of 50,000 k cu mm above 3,00,000 Kilo cubic mm.		500	
[n] Cost of Labour per Carton		1,000				
4	Packing of panels using heavy duty corrugated box as per pkg specifications outlined at Part – I D para 2.3 with all other packing materials such as polythene sheet 700g, silicagel, coir, edge board, plywood, pvc strappings, markings and stickers/labels.	Per Sq. Mtr		3,000		
5	Packing of loose items,spares and similar items using heavy duty corrugated box as per pkg specifications outlined at Part – I D para 2.3 with all other packing materials such as polythene sheet 700g, silicagel, coir, edge board, rotolock, document pouch, plywood, pvc strappings, markings and stickers / labels.	Per Sq. Mtr		1,000		
Sub-Total for Part V'D'						

PART - V [E]

**SCHEDULE OF RATES FOR PACKING OF MATERIALS USING
CORRUGATED SUN - PAC [PVC] CARTON**

1	Packing of CE materials using 5 mm thick SUNPAC PVC corrugated sheet carton with all packing materials including polythene cover, silicagel, BOPP tape, PVC strappings, markings and suitable cushioning materials in the following sizes:.	Unit	Rate for Two years	Total quantity estimated for Two yeats	Total cost
	[a] for Volume upto 20,000 Kilo Cubic mm	Volume in Kilo Cubic mm		500	
	[b] for Vol. Upto 40,000 Kilo Cubic mm	-do		500	
	[c] For vol upto 60,000 Kilo Cubic mm	-do		200	
	[d] For vol upto 80,000 Kilo Cubic mm	-do		250	
	[e] For vol upto 100,000 Kilo Cubic mm	-do		300	
	[f] For vol upto 120,000 Kilo Cubic mm	-do		500	
	[g] For vol upto 150,000 Kilo Cubic mm	-do		300	
	[h] For vol upto 180,000 Kilo Cubic mm	-do		250	
	[i] For vol upto 200,000 Kilo Cubic mm	-do		250	
	[j] For vol upto 230,000 Kilo Cubic mm	-do		250	
	[k] For vol upto 260,000 Kilo Cubic mm	-do		400	
	[l] For vol upto 300,000 Kilo Cubic mm	-do		350	
	[m] For every additional vol of 50,000 Kilo cub mm above 300,000 Kilo cubic mm.	-do		350	
2	Labour charges for packing in Sunpac sheet cartons. Carton and Polythene will be supplied by BHEL.	Per carton		1000	
	Sub-Total for Part V 'E'				

Part - V [F]

Schedule of Rates for packing consumables to be supplied by the contractor

Part - V 'F'

SI No	Type of Packing	Unit	Rate for Two years	Total Quantity Estimated for Two years	Total Cost
1	Silicagel	Kgs.		500	
2	Polythene Sheet (175 Micron)	Kgs.		500	
3	Iron Clamps	Each		1,000	
4	Hoop Iron (0.6 mm Thick)	Kgs.		500	
5	Rubberised Coir	Kgs.		1,000	
6	Tarfelt	Square Mtrs.		1,000	
7	Nails (2" and 2 - 1/2")	Kgs.		500	
8	Packing Note Holder	Each		1,000	
9	Name Plate	Each		1,000	
10	Rubber Wood	CFT.		500	
11	Bituminised Water Proof Kraft Paper	Square Metres		500	
12	Plywood of a) 9 mm	SFT.		1,000	
	b) 12 mm	SFT.		1,000	
13	Galvanised Iron Sheet of Thickness 0.3 mm +/- 0.05 with suitable Nails & Wooden batten for covering packed cases (including Labour Charges)	Square Metres		2,000	
14	Labour Charges for providing GI Sheet Covering the cases.	Square Metres		2,000	
15	Expanded Polyethylene Foam Corner Blocks of Size: 50 x 250 x190 mm, Thickness: 50 mm, Density: 25 to 38 Kg/Cu.M.	Nos.		1,000	
16	Labour Charges for unpacking of cases	Per case		1,000	
	a) Cubicles				
	b) Small Cases			1,000	
Sub-Total for Part V'F'					

[Annexure - A](#)

[Annexure - B](#)

[Annexure - C](#)

[Annexure - D](#)

[Annexure - E](#)

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REVISION HISTORY SHEET

REV NO	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	06/03/92	SUPERCEDES CN 43000	-	VS, MAS, SHG	N. J
01	19/06/93	GENERAL	F. B. FROM QUALITY	SHG	"
02	24/06/93	CL 3.4.10	F. B FROM	SHG	N. J
03	01/07/93	SEMICONDUCTOR & PHTOVOLTAIC PANELS ADDED	F. B FROM DESPATCH	SHG	N. J
04	17/10/94	TOTALY REVISED	F. B. FROM QUALITY	SHG	N. J
05	08/06/95	ANNEXURE ADDED	F. B. FROM QUALITY ACCEPTANCE CRITERIA OF WOOD ADDED	SHG	N. J
06	17/11/95	CL 2.5.10 ALTERED	F. B FROM QS AND SHIPPING	SHG	N. J
07	05/03/97	UNDER CL 3.0 & 3.9.1 RPP ADDED ACCEPTANCE CRITERIA REMOVED	F. B FROM SHIPPING & QC	SHG	N. S
08	29/08/01	CL.2.2.8 & 4.1 changed	' '	SHG	N. S

APPROVED :
 N. SRIDARAN

PREPARED : SHG ISSUED : STDS GROUP DATE : 29/08/01

- 2.2.8 Distance between any 2 binding planks shall be less than 750 mm. As shown in Fig-3, diagonal planks shall be used in between binding planks when distance between inner to inner of vertical planks is more than 750 mm.
- 2.2.9 Distance of the outer edges of these planks from the edge of case shall be less than 250 mm.
- 2.2.10 Diagonal planks are not required for top planks and width side also, if the width of pallet is less than 750 mm.
- 2.2.11 Jointing of planks: Single length planks shall be used for cubicles whose overall length is less than 2400 mm. For cubicles of length more than 2400 mm, jointing is permitted. The jointing shall be done with one single or maximum of 2 planks of wood same as other planks of width 250 mm (minimum) with two rows of nails on either side of the joint in zig-zag manner. From the joint along height side it shall be of lap joint with over lap of atleast the width of plank.
- 2.2.12 Tongue and Groove joints: Two Consecutive planks shall be joined by tongue and groove joint. Depth of tongue shall be 12 mm, thickness of tongue shall be 8 mm. The groove dimensions shall be such that the tongue fits tightly into the groove to make a good joint.
- 2.3 PERMISSIBLE DEFECTS:- Wood shall be free from knots, bows, visible sign of infection and any kind of decay caused by insects, fungus, etc.
- End splits: Longest end splits at each end shall be measured and lengths added together. The added length shall not exceed 60 mm per metre run of shooks. Wood pins shall be used to prevent further development of split.
- Surface cracks: Surface cracks with a maximum depth of 3 mm are permissible. A continuous crack of any depth all along the length is not allowed.
- 2.4 CHEMICAL TREATMENT FOR PRESERVATION OF WOOD:-
- 2.4.1 This treatment provides protection to the packing wood against deterioration due to fungi and attack by termites, borers and marine organism and any kind of infections.
- 2.4.2 The wooden planks, after making tongues / grooves shall be treated with chemicals.

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- 2.4.3 The chemical used shall be ready mix ASCU paste supplied by ASCU HICSON Calcutta. This consists of Arsenic pentoxide, copper sulphate sodium dichromate. This paste shall be mixed at the rate of 1 kg of paste per 10 liters of water to the extent of water used.
- 2.4.4 The chemical treatment shall be done at the premises of the contractor. A cement concrete tank of capacity to hold a minimum of 2000 litres of solution shall be constructed. The solution shall be prepared in the presence of BHEL- EDN's representative by contractor. The wooden planks shall be soaked in the solution for a minimum of 12 hours. The solution shall be replenished after treating a maximum of 12 cubic metres of wood. A log book shall be maintained by the contractor to give the details of date of preparation of solution, quantity of solution prepared, quantity of chemicals used, quantity of wood treated and the details of replenishment. Samples of solutions will be got tested at the laboratories designated by BHEL. The testing fees to be paid to the laboratories will have to be borne by the contractor. The solution shall be tested as and when required.
- 2.5 OTHER MATERIALS:
- 2.5.1 NAILS: The dia. of the nails shall be 3.15 mm. The length of the nails shall be 65 mm wherever two planks of 25 mm thickness are joined and 75 mm wherever a 25 mm planks is joined to a 50 mm plank.
- 2.5.2 BLUE NAILS: These are used for nailing bituminised kraft paper/hessian cloth to the planks. The length of the nails shall be 16 mm.
- 2.5.3 HOOP IRON STRIPS: These are used for strapping the boxes. The width of the strips shall be 19mm and thickness 0.6mm. The material shall be free from rust.
- 2.5.4 CLIPS: These shall be used for strapping the hoop iron strips on the boxes.

- 2.5.5 BRACKETS: These brackets are used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of thickness 2ñ1 mm and width 25ñ1 mm. The brackets shall be of " L" shape, the length of each side being 100ñ2 mm. Two holes shall be provided towards the end of each side for screwing /nailing.
- 2.5.6 FASTENERS: Bolts, double nuts, spring washers will have to be used for packing of some special items like transformers, reactors, breakers, etc., to hold the job to the bottom plank of the box. The bolts, nuts, washers will be provided by BHEL. However, drilling of holes will have to be done using contractor's tools.
- 2.5.7 POLYETHYLENE SHEET: The polyethylene sheets are used to make covers to the jobs individually. The material shall have a thickness of 0.175 mm (175 microns). The polyethylene sheet shall be clear and transparent.
- 2.5.8 BITUMINISED WATER PROOF KRAFT PAPER: This is used for lining the inside of shooks of cubicles.
- 2.5.9 BITUMEN COATED HESSIAN POLYETHYLENE KRAFT PAPER: This is used for lining the inside of top planks of cubicles and for lining of all inner sides of boxes.
- 2.5.10 RUBBERISED COIR: The rubberised coir is used as cushioning material. For the packing of loose items, items are to be arrested by using rubberised coir. For the packing of cubicles rubberised coir of thickness 25mm and width 75mm shall be used.
- 2.5.11 FOAM RUBBER / 'U' FOAM: This is used for covering the delicate items. This material is normally provided by BHEL.
- 2.5.12 THERMOCOL (EXPANDED POLYSTYERENE) SHEETS): This is used for covering delicate items. This material is normally provided by BHEL.
- 2.5.13 MARKING PLATE: This shall be of anodised aluminium sheet. Details and specifications are given in Fig-5.
- 2.5.14 PACKING SLIP HOLDER: This shall be of galvanised iron /tinned sheet / aluminium sheet.

2.5.15 SILICA GEL: This shall be of indicating type.

2.5.16 COTTON BAGS: These are used for holding silica gel. The bags shall have the following matter indicated them:

BHEL-EDN BANGALORE-560026
SILICA GEL
INDICATING TYPE
BLUE : ACTIVE
ROSE : REDUCED ACTIVITY
WHITE : NO ACTIVITY. TO BE REPLACED WITH FRESH
SILICA GEL

2.5.17 COTTON / PLASTIC TAPE: This is used for tying small items and also to prevent vibrations of moving parts within the cubicles.

2.5.18 MARKING INK: The ink used normally is black in colour. In some special cases other colour also will have to be used. The ink shall be non-fading/indelible and non-washable by water.

2.5.19 POLYETHYLENE BAGS: These are to be used for keeping the packing slips. The bag shall be of size 70 mm X 100 mm (minimum).

2.5.20 Hessian cloth, twine thread, paint will have to be used in packing certain items.

3.0 PACKING SPECIFICATIONS: 9 types of packing are used as follows:

- 1) Packing of cubicles with rubber wood.
- 2) Packing of cubicles with Silver Oak wood.
- 3) Packing of empty cubicles with rubber wood.
- 4) Packing of loose items/spares with rubber wood.
- 5) Packing of loose items /spares with Silver Oak wood.
- 6) Packing of Photo-voltaic items with rubber wood.
- 7) Packing using bitumen coated hessian polyethylene kraft papers.
- 8) Supply of rubber wood pallets for empty cubicles.
- 9) Packing of semiconductor panels.
- 10) Packing of material covered under category of

RPP (Registered
Postal Parcel)

3.1 PACKING OF CUBICLES WITH RUBBER WOOD:

- 3.1.1 The packing is to be done as per clause 2.0 in all respects.
- 3.1.2 The cubicles are already fixed on wooden pallets. Hence the contractor need not arrange the bottom pallets normally.
- 3.1.3 The cubicles will be of different sizes both widthwise and lengthwise. The cubicles may be made up of single suite, 2 Suite, 3 Suite, 4 Suite, etc., The width of the cubicles generally varies from 400 mm to 1650mm. The length of the cubicle, generally varies from 1500 mm to 4800 mm. The height is normally 2430 mm. In some cases the height may be less/more.
- 3.1.4 BITUMINISED WATER PROOF KRAFT PAPER: The inner surface of 4 sides of shooks shall be nailed with Bituminised water proof Kraft paper (as per 2.5.8) using blue nails (as per 2.5.2) wherever 2 pieces of kraft paper are used, the joint shall have an overlap of minimum 20 mm.
- 3.1.5 BITUMEN COATED HESSIAN POLYETHYLENE KRAFT PAPER: The inner surface of top cover shall be nailed with Bitumen coated Hessian polyethylene kraft paper (as in 2.5.9). This sheet shall project outside on 4 sides by atleast 100 mm and shall be nailed properly on sides. Joining of 2 sheets should have overlap of minimum 20 mm.
- 3.1.6 POLYETHYLENE SHEET COVERING: The cubicles shall be covered with a polyethylene petticoat (Polyethylene sheet as per 2.5.7). This shall be 'tailor made' to fit the cubicle. The sealing shall be such as not to allow any moisture to enter the cubicle.
- 3.1.7 SILICA GEL: Silica gel (as per 2.5.15) packed in cotton bags shall be kept at different places inside the cubicle as per EDN directions. Each suit of cubicle shall be provided with 1 kg of Silica gel (for a 4 suit cubicle 4 kgs of Silica Gel to be used. The bag containing silica gel to be as per 2.5.16).
- 3.1.8 LOOSE PARTS: Any loose parts in the cubicles, shall be tied using cotton / plastic tape. Wooden battens shall be provided wherever necessary.
- 3.1.9 WOODEN BATTENS: In case of cubicle which are not rectangular in shape like control desks, sufficient number of wooden rafters/battens of proper size shall be provided to give strength to the package.

- 3.4 PACKING OF LOOSE ITEMS/SPARES USING RUBBER WOOD:
- 3.4.1 Shape of cases shall be square, rectangular with single gabled roof or with double gabled roof depending on the nature of the job to be packed. Construction shall be as per drawings enclosed. Only gable will be additional as required.
 - 3.4.2 Wood shall be rubber wood with Tongue and Groove joint as per clause 2.2.12.
 - 3.4.3 Chemical treatment as per clause 2.4 to be done.
 - 3.4.4 Width of planks shall be at least 100 mm. Width of binding planks (battens) shall be at least 75 mm.
 - 3.4.5 External surface of planks on front and rear shall planed 100% (except bottom plank).
 - 3.4.6 Inner surfaces of all 6 sides shall be lined with bitumen coated hessian polyethylene kraft paper (as per clause 2.5.9) using blue nails.
 - 3.4.7 Rubberised coir of minimum 25mm thickness and 100 mm width shall be nailed to inner surfaces of bottom and 4 sides of box.
 - 3.4.8 Internal packing: Items that go into the box shall be packed using polyethylene sheet/ U foam/ thermocol sheets/ air bubbled sheets/ paper cartoons and cotton tape. Any space left between the job and the sides and the top of the box shall be filled with rubberised coir to get proper cushioning effect.
 - 3.4.9 Certain items like transformers, reactors, breakers, etc shall be bolted to the bottom of the box using bolts, nuts and washers.
 - 3.4.10 Silica gel as per clause 2.5.15 held in cotton bags as per clause 2.5.16 shall be kept at proper places in the box.

SL NO	BOX INNER DIMENSIONS (mm)	VOLUME (litres)	QUANTITY OF SILICA GEL (grams)
1	300X300X300	27	100
2	400X400X400	64	100
3	500X500X400	100	100
4	600X600X400	144	100
5	700X700X400	196	100
6	770X770X500	297	100

- 3.4.11 Packing slip kept in polyethylene bag (clause 2.5.19) shall be placed in the box.
- 3.4.12 Marking plate as per clause 2.5.13 shall be nailed to side of the box.
- 3.4.13 Two numbers of hoop iron strips as per clause 2.5.3 shall be strapped tightly on the case using clips.
- 3.4.14 Stencil marking of various details and marking of various symbols shall be done as per BHEL instructions using indelible/non-washable marking ink.

Loose items to be kept inside the cubicle

- 1.The components which are removed from cubicle for shipping purpose only, such as meters shall be kept inside the cubicle individually kept in wooden box and tied firmly in bottom of cubicle.
- 2.Other items which are given loose in addition to cubicle, shall be packed in separate boxes (like cables).
- 3.For transformer cubicles loose items shall be packed in separate boxes and these boxes may be tied firmly in bottom of cubicles.
- 4.Items which are bigger in size such as impulse tubes may be kept in top of cubicles firmly bunched and tied.

- 3.5 PACKING OF LOOSE ITEMS USING SILVER OAK: Packing of loose items for export shall be done in same manner as at clause 3.4 above except for following changes:
 - Wood shall be Silver oak instead of rubber wood.
 - Fumigation may have to be done.
 - 2 polyethylene covers to be provided.

3.9 PACKING OF SEMICONDUCTOR DEVICES

Semiconductor devices shall be received in prepacked condition as per the device type and packed in plywood boxes as per the following procedure,

1. Provide thermocole sheets/rubberised coir.
2. Stack the prepacked devices inside the case.
3. Fill up gaps with thermocol sheets/rubberised coir.
4. Close the top cover and nail.
5. Provide marking with the following details.
 - a) Consignee address
 - b) M.O. number
 - c) P.O. reference
 - d) Description of material

3.9.1 Packing of material for Registered Post Parcel (RPP)
 RPP packing boxes to be made inhouse with 12mm (for sides) and 6mm thick (for top and bottom) commercial quality ply wood sheet. The size of the box should be decided on the material to be despatched. Between material 10mm and 15mm thick thermocole sheets or rubberised coir/foam should be provided as cushion.

4.0 ADDITIONAL POINTS TO BE FOLLOWED FOR EXPORT ORDER SEAWORTHY PACKING:

4.1 Packing to be done as per Fig - 6.
 Thickness of G.I. sheet 0.3 .1/-0.05 mm.
 FIGURE-1: DETAILS OF CUBICLE PACKING BOX

SL NO	TYPE OF CUBICLE (FOR SET OF)	VARIANT NO.	DIMENSIONS			DRAWING REFERENCE (FOR OTHER DETAILS)
			A	B	C	
01	2-Cubicles	00	950	1561	2430	2-699-21-00119
		01	950	1561	2430	
		02	1150	2101	2430	
		03	950	2101	2430	
		04	1350	2450	2455	
		05	1650	2150	2455	
		06	1150	1700	2430	
02	3-Cubicles	00	950	2112	2430	2-699-21-00120
		01	950	2242	2430	
03	4-Cubicles	00	950	2663	2430	2-699-21-00125
		01	950	2793	2430	

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FIG -2 : BINDING OF PANEL

FIGURE-3 : LIFTING OF PACKED CASE

NOTE : 1) Spreaders are to be used only for lifting the case.
Spreaders are wooden items & not nailed to the case.

2) Height between crane hook & spreaders to be kept
minimum to void rotation of case while lifting.

FIG-4 : LIFTING AND MOVING UN PACKED CASE

FIG-5 : MARKING PLATE

FIG-6 : CLOSED PACKING CASE WITH G.I.

SHEET SHOWING LAYERS OF PACKING MATERIALS.

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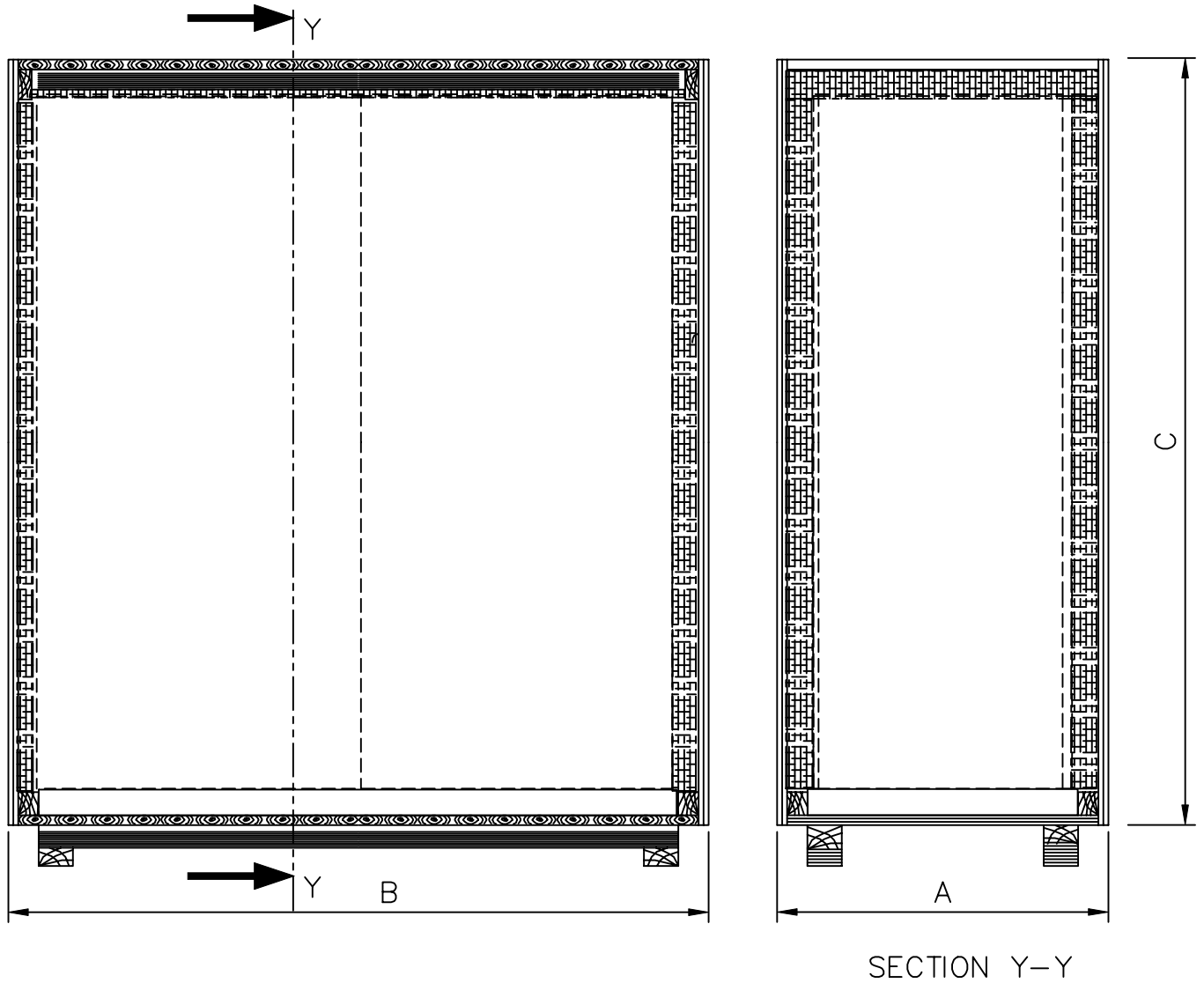


FIG-1 : DETAILS OF CUBICLE PACKING BOX.



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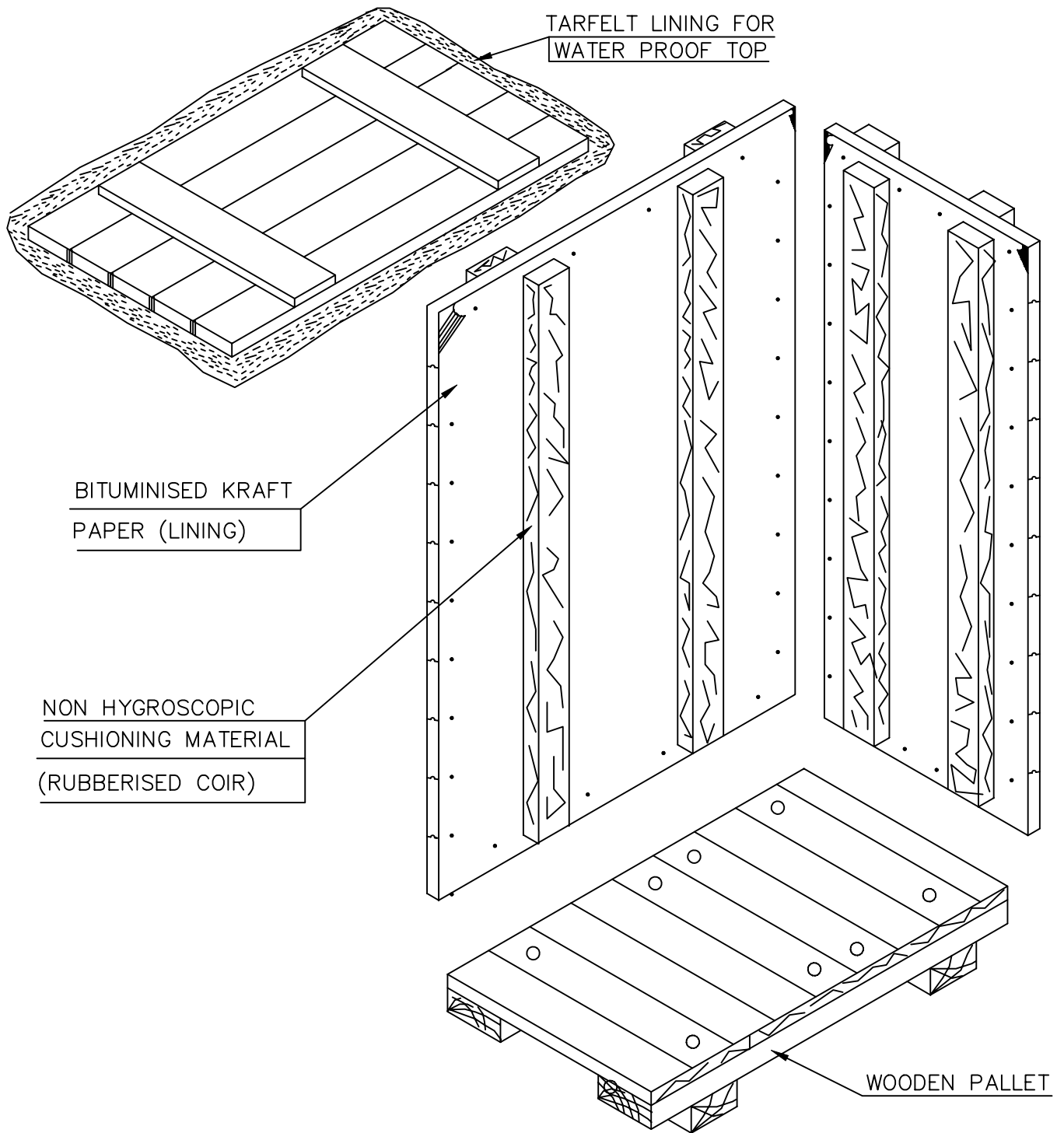


FIGURE-2

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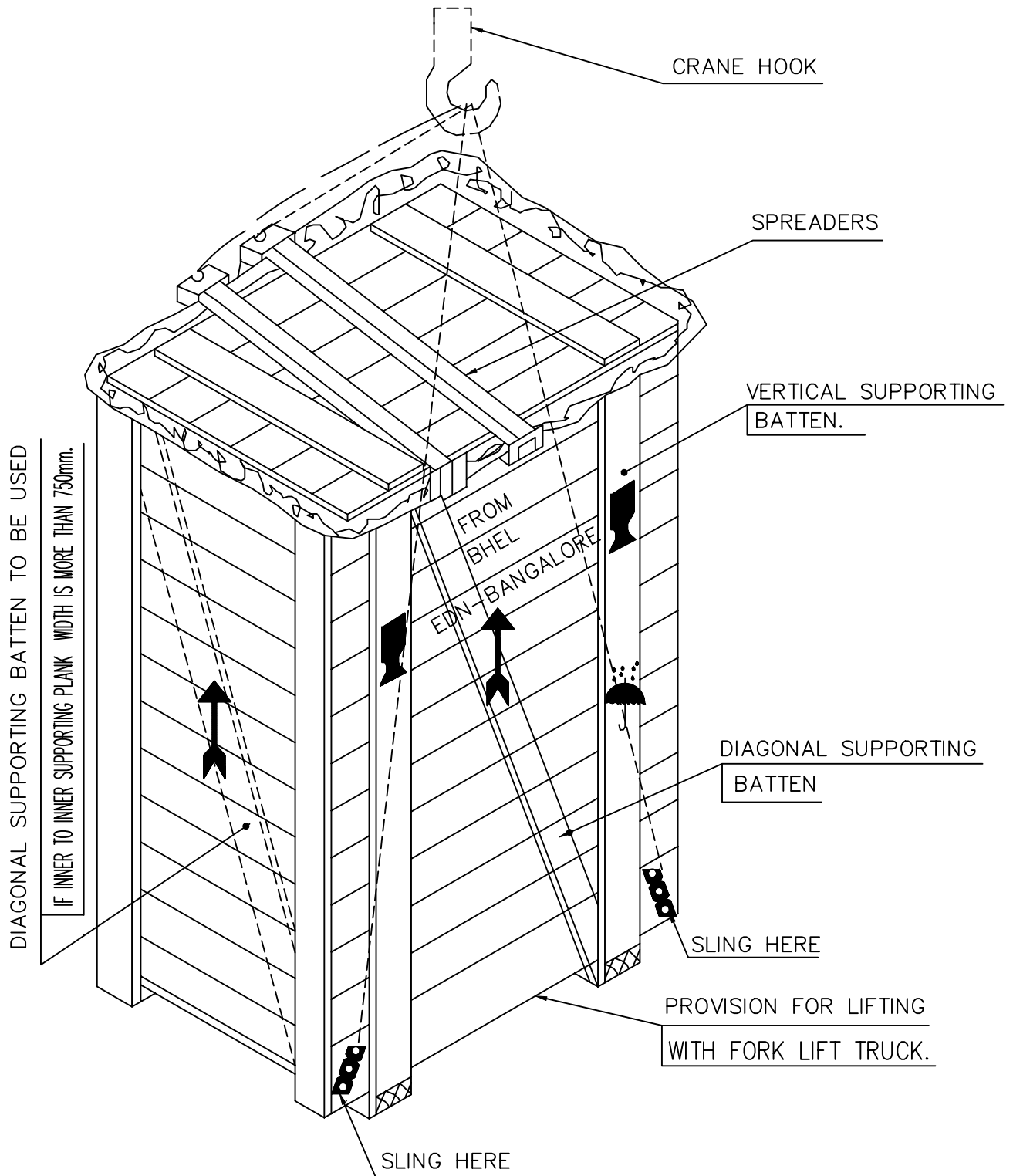


FIG-3 : LIFTING OF PACKED CASE.



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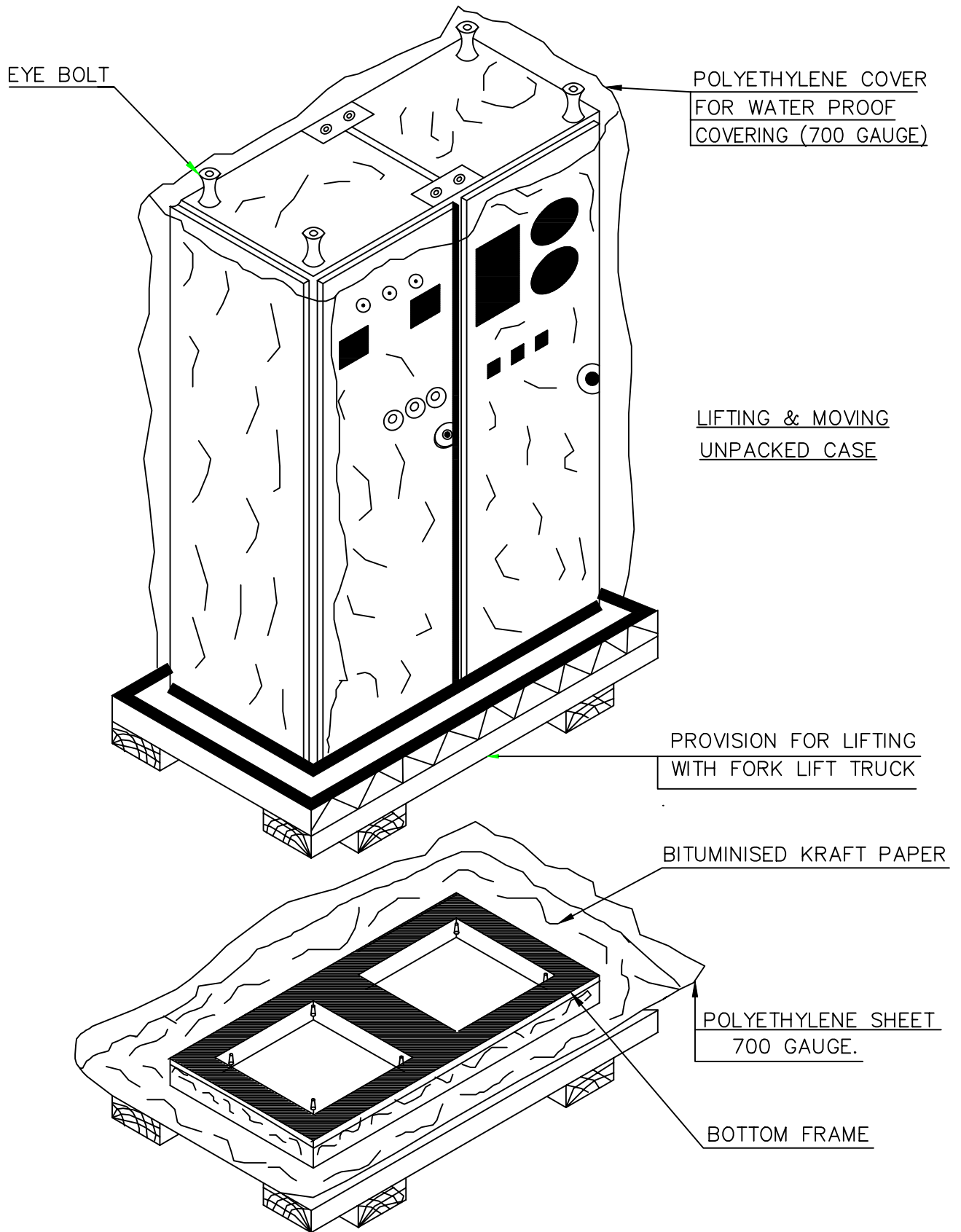


FIGURE-4



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		BHEL-EDN-BANGALORE-26			
CONSIGNEE					
MATERIAL					
CUSTOMER REF.		MO. NO.			
DESPATCH ADVICE NOTE NO.		CASE NO.			
DIMENSIONS(MM) LXBXH		NET WT -KGS		GROSS WT -KGS	
SPECIAL INSTRUCTIONS		HANDLE WITH CARE - KEEP DRY DO NOT DROP - DO NOT TILT			

FIG-5 : MARKING PLATE.

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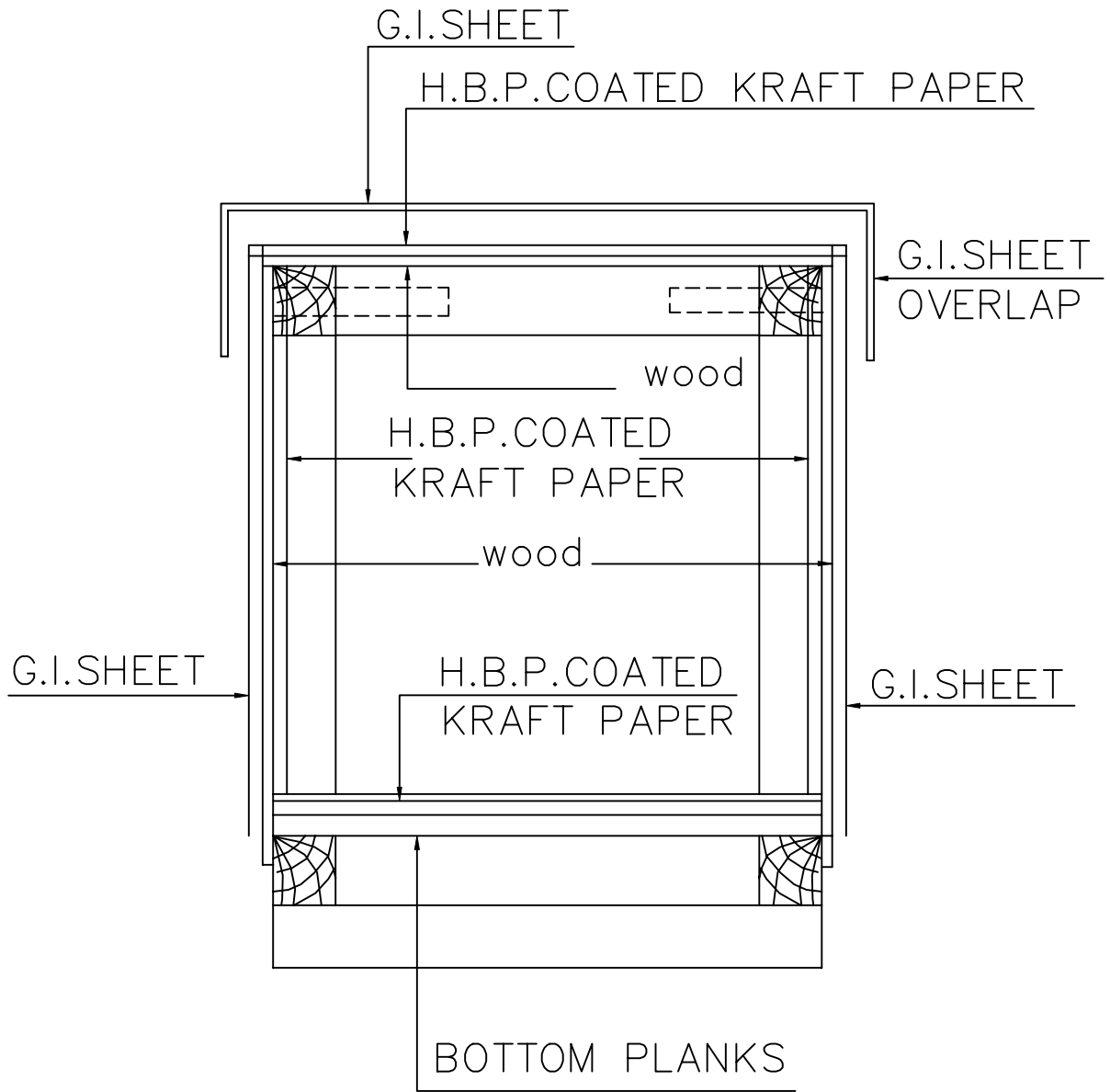


FIG-6 : CLOSED PACKING CASE WITH G.I.SHEET
SHOWING LAYERS OF PACKING MATERIALS.

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BHEL PLANT STANDARD ED 049 00 92

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REVISION HISTORY SHEET

REV NO	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	11/05/95		-	VS, SHG	N. J
01	05/06/95	ANNEXURE ADDED	ACCEPTANCE CRITERIA INCLUDED F. B. FROM QUALITY	SHG	N. J
02	06/03/97	CL 6.4.1 ALTERED	F. B. FROM SHIPPING	SHG	N. S
03	20/12/99	IS. Year of issue Removed	-	CCR	NS

APPROVED :
N. SRIDARAN

PREPARED : ISSUED : DATE :
CCR STDS GROUP 20/12/99

BHEL

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REV NO 03

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PROCEDURE FOR PACKING OF CONTROL EQUIPMENTS USING PLY
WOOD.

- 1 PURPOSE : To describe the materials and procedure for packing.
- 2 SCOPE:Applicable for packing of control cubicles, loose items, spares of Control Equipment and Transmission System Control products.
- 3 MATERIALS
 - 3.1 WOOD
 - 3.1.1 For Inland contracts:
 - 3.1.1.1 Plywood of Boiling Water Resistance (BWR) grade and termite, fungus proof as per IS:303 of 12 mm thick for control cubicles, single and multi cubicles, loose items and spares cases. The plywood shall be bonded with high quality Phenol Formaldehyde Synthetic Resin and specially treated with preservatives to repel termites and wood destroying organisms. The plywood shall withstand the stress caused by cyclic changes in weather conditions. It shall be durable and resistant to heat, sun and moisture. The sheets such procured shall have IS mark IS 303 and BWR grade stamped on it.
 - 3.1.1.2 Silver oak treated with ASCU solution of 45x45 mm for support batten for loose items, spares and single suit cubicles and 70 x 45 mm for cubicles suit of 2 and longer sections.
 - 3.1.2 For Export Contracts
 - 3.1.2.1 Plywood of Marine grade as per IS:710 of 9 mm thick for control cubicles of single suit and 12 mm thick for loose items and spare case for the boxes. For suit of 2,3,4 and longer cubicle sections, 19mm thick is to be used.

APPROVED :
N. SRIDARAN

PREPARED : ISSUED : DATE :
VS, SHG STDS GROUP 11/05/95

The plywood shall be bonded with high quality Phenol formaldehyde Synthetic Resin and is treated with permanent types of preservatives through vacuum-pressure impregnation as per IS:5539. It shall be highly resistant to attacks from fungi, termites and wood destroying organisms including marine borers. The plywood shall withstand the stress caused by cyclic changes in weather conditions. It shall be durable and resistant to heat, sun and moisture. The sheet shall have IS:710 and marine grade marking.

3.1.2.2 Same as clause 3.1.1.2.

3.1.3 BHEL EDN will be carrying out test on ISI marked plywood whenever required.

3.2 Fasteners: M8 x 130 mm and M8 x 150 long zinc plated bolts and M8 zinc plated nuts for fixing, and spring washers.

3.3 Nails: Nails of dia 3.15 mm and about 40 mm for nailing of plywood and silver oak batten. Suitable smaller size is to be used for other nailing.

3.4 Polyethylene sheet: : The polyethylene sheets are used to make covers for the jobs individually. The material shall have a minimum thickness of 0.175 mm (175 microns). The polyethylene sheet shall be clear and transparent manufactured out of virgin material. Reprocessed material shall not be used.

3.5 Bituminised water proof kraft paper - used for lining the inside of shookees of cubicles.

3.6 Bitumen coated Hessian polyethylene kraft paper- used for lining the inside of top cover for cubicles and all inner and top sides for small boxes.

3.7 Rubberised Coirs- used for cushioning and to fill the gap inside packing boxes. The coir shall be about 100 mm wide and 25mm thick.

3.8 Foam rubber/U Foam - This is used for covering the delicate items. This material is normally provided by BHEL.

3.9 Thermocole (Expanded polystyrene) sheets - This is used for covering delicate items. This material is normally provided by BHEL.

3.10 Silica gel - shall be of indication type to conform to IS: 3401:shall be blue in colour while usage.

3.11 Cotton bag - These are used for holding silica gel. The bags shall have the following matter indicated on them:

BHEL-EDN	BANGALORE-560026
SILICA GEL INDICATING TYPE	
BLUE	: ACTIVE
ROSE	: REDUCED ACTIVITY
WHITE	: NO ACTIVITY. TO BE REPLACED WITH FRESH SILICA GEL

3.12 Cotton/Plastic tape-This is used for tying small items and also to prevent vibrations of moving parts within the cubicles.

3.13 Polyethylene bags - These are to be used for keeping the packing slips. The bag shall be of size 70 mm X 100 mm (minimum).

3.14 Hessian cloth, twine thread, paint will have to be used in packing certain items.

3.15 Marking plate - This shall be of anodised aluminium sheet. Details and specifications are given in Fig-3.

3.16 Marking ink - Ink used shall be normally black in colour. The ink shall be indelible, non fading and non washable in water.

3.17 Packing Slip Holder - This shall be of galvanised iron tinned sheet / aluminium sheet.

4 Chemical treatment for silver oak preservation

4.1 The silver oak battens are to be treated with ASCU solution .

4.2 The chemical used shall be ready mix ASCU paste supplied by ASCU HICSON Calcutta. This consists of Arsenic pentoxide, copper sulphate, sodium dichromate. This paste shall be mixed at the rate of 1 kg of paste per 10 litres of water.

4.3 The chemical treatment shall be done at the premises of the contractor. A cement concrete tank of capacity to hold a minimum of 2000 litres of solution shall be constructed. The solution shall be prepared in the presence of BHEL- EDN's representative by contractor. The wooden battens shall be soaked in the solution for a minimum of 12 hours.

The solution shall be replenished after treating a maximum of 12 cubic metres of wood for 2000 litres of solution.

A log book shall be maintained by the contractor to give the details of date of preparation of solution, quantity of solution prepared, quantity of chemicals used, quantity of wood treated and the details of replenishment.

Samples of solutions shall be tested at the laboratories designated by BHEL. The testing fees to be paid to the laboratories will have to be borne by the contractor. The solution shall be tested as and when required.

5 Jointing of plywood-To the extent possible, single plywood sheet shall be used in case of equipment of large size, jointing is allowed as bellow.

5.1 The joining shall be as close to the center of equipment as possible, but not less than 500 mm from one edge.

5.2 While joining (2 or more plywood sheets), care shall be taken to fix the sheets in the direction of the grain structure.

5.3 While joining, 2 sheets shall be kept close to each other and treated silver oak batten of 100 mm width and 45 mm thick to be used and nailed to both plywood sheets alternately (2 numbers) in zig-zag manner.

5.4 Jointing of silver oak batten : Only single length silver oak batten shall be used. In case of height or width of equipment is more than 2400 mm, jointing of batten is acceptable. The jointing of batten shall be such that two batten are kept together and one more batten of width & length of about 200 mm to be nailed on both the planks as in Clause 5.3 above.

5.5 The above jointing is to be done close to center of equipment.

6 Packing procedure

6.1 Packing of cubicles for inland contracts.

6.1.1 Packing to be done using materials given in clause 3.0.

6.1.2 The cubicles are fixed on wooden pallets.

Hence the contractor need not arrange the bottom pallets normally.

6.1.3 Loose parts : All loose parts in the cubicles, shall be tied using cotton / plastic tape. Wooden battens shall be provided wherever necessary.

6.1.4 Additional loose items which may be kept inside the cubicle.

a. The components which are removed from cubicle for loose shipping, such as meters shall be kept inside the cubicle individually kept in wooden box and tied firmly to the bottom of cubicle.

b. Other items which are given loose in addition to cubicle, shall be packed in separate boxes (like cables).

c. For transformer cubicles loose items shall be packed in separate boxes and these boxes may be tied firmly in bottom of cubicles.

d. Items which are bigger in size such as impulse tubes may be kept at the top of cubicles firmly bunched and tied.

- 6.1.5 Wooden batten : This batten shall be silver oak wood .In case of cubicle which are not rectangular in shape like control desks, sufficient number of wooden rafters/battens of proper size shall be provided to give strength to the package.
- 6.1.6 Silica gel: Silica gel (as in 3.10) packed in cotton bag (as in 3.11) shall be kept at different place inside the cubicle as per EDN directions.Each suit of cubicle shall provided with 1 kg of silica gel (for a suit of 4 cubicles, 4 kg of silica gel shall be used).
- 6.1.7 Polyethylene sheet covering: Cubicles shall be covered with polyethylene petticoat (sheet as in 3.4). This shall be tailor made to fit the cubicle. The sealing shall be such as not to allow any moisture to enter the cubicle. This sheet is to be folded to the bottom pallet with wooden planks on 2 larger sides.
- 6.1.8 After completion of this, the arrangement is as shown in Fig.1.
- 6.1.9 Rubberised coir: (as in 3.7) to be nailed from inner side of plywood after pasting kraft paper for full length with a pitch less than 500mm with a min. of 2 rows of cover is to be used.
- 6.1.10 Bituminised water proof kraft paper: (as in 3.5) to be pasted with glue on 4 inner sides of plywood. Whenever 2 pieces of kraft paper are used, the joint shall have an over lap of min 20 mm.
- 6.1.11 Bitumen coated Hessian polyethylene kraft paper (as in 3.6) to be nailed using nails (as in 3.3) on top cover inner surface. This sheet shall project outside on 4 sides by atleast 100 mm and shall be folded and nailed on to the sides. Joining of 2 sheets shall have an overlap of min 20 mm.
- 6.1.12 After completion of above steps, the arrangement shall be as given in Fig.2.
- 6.1.13 Marking Plate : One no (as in 3.15) shall be nailed to the front side of case, item as shown in Fig.3.

6.1.14 Case Marking : After complete packing, marking of various details and symbols as given by EDN shall be done using indelible ink (as in 3.16)

6.1.15 Packing Slip : Packing slip kept in polyethylene bag (as in 3.18) shall be placed inside the box at appropriate place before closing the top. In addition one more packing slip covered in polyethylene cover and packing slip holder (as in 3.17) shall be nailed to front or rear of shock.

6.1.16 At the end of this stage, the arrangement is as shown in Fig.4.
Front and rear shock fixing arrangement to the bottom of the pallet is as shown in Fig.5

6.1.17 The lifting arrangement of the packed case is shown in Fig.6

6.2 Packing of cubicles for export contracts

Procedure is same as that given in 6.1 except for following changes:

- Two Polyethylene petticoat (as in 6.1.7) instead of one
- Fumigation may have to be done if required extra charges will be paid for this to the contractor .

6.3 Packing of empty Cubicles

Procedure is same as that given in 6.1 except for following changes

- Bituminised kraft paper, bitumen coated Hessian polyethylene paper, silica gel need not be used.

6.4 Packing of loose items/spares for inland contracts

6.4.1 All the materials and procedure are same as in 6.1 except that :

- No joining of plywood and silver oak batten
- Inner sides of all 6 sides shall be nailed with bitumen coated Hessian polyethylene kraft paper (as in 3.6) using nails.
- Kraft paper (as in 3.5) is not required
- Silica gel quantity is 100 gm approx per box.
- Rubberised coir is to be nailed to inner surfaces of bottom 4 sides of box.
- Clause 6.1.10 is not applicable.

Individual items to be sealed with polyethylene sheet (as in 3.4) and one full cover of polyethylene sheet covering of all items is to be made.

6.4.2 In few cases gabled roof (single or double gable) may have to be made, details of which will be given by EDN.

6.4.3 Internal Packing: Items that go into the box shall be packed using polyethylene sheet/ U foam/ thermocol sheets/air bubbled sheets/ paper cartoons and cotton tape. Any space left between the job and the sides and the top of the box shall be filled with rubberised coir/air bubbled sheet /thermocole to get proper cushioning effect. Certain items like transformers, reactors, breakers, etc shall be bolted to the bottom of the box using bolts, nuts and washers.

6.5 Packing of Loose items/ Spares for Export Contracts: Procedure is same as that given in 6.4 except for following changes:

- Two polyethylene covers to be provided,
- Fumigation may have to be done, if required, for which payment will be made by EDN.

6.6 REFER ANNEXURE FOR ACCEPTANCE CRITERIA OF PLY WOOD

ACCEPTANCE CRITERIA

PLYWOOD FOR GENERAL PURPOSE
GRADE BOILING WATER RESISTANT
FOR PACKING - AS PER IS:303

1. All the plywood sheets shall be procured directly from the manufactures' godown only and not from any dealers.
2. Plywood sheets shall have IS:303 & BWR grade stamped on each sheet.
3. Packing/contractor should give a certificate to these effect.
4. Contractor shall identify each sheet with their name/firm in suitable place.
5. Visual checks to be done by packing contractor and EDN-QC CE shipping.
6. For other parameters, testing will be done at authorised laboratories/institutions by EDN on sample basis.

FOR BWR GRADE-TABLE-1 QUALITY REQUIREMENTS OF SURFACES OF PLYWOOD

S1 Defect NO Category	Maximum Number of Defect Permitted on any one surface of panel (as applicable to Type A Surface of IS:303)
1. Blister	Nil
2. Check	Individual check not more than 50mm in length and the total length not more than 300mm/mý
3. Discoloration	Nil
4. Dote	5cm/mý
5. Insect hole	Scattered up to 12 holes/mý
6. Joints	One joint for every multiple of 200mm provided no individual piece is less than 100mm in width
7. Knots (dead)	2 up to 12mm dia/mý

S1	Defect	Maximum Number of Defect Permitted on
NO	Category	any one surface of panel (as applicable
		to Type A Surface of IS:303)
	8. Pin knots (dead)	2/m ²
	9. Pin knots (live)	No restriction
	10. Knots (tight)	6 up to 25mm dia/m ²
	11. Patches	4 patches/m sq provided they are all
		tight patches & do not mar the
		appearance
	12. Splits	2 splits each not more than 1mm wide
		and length not more than 100mm provided
		they are filled with suitable filler
	13. Swirl	Unlimited provided they do not mar the
		TABLE - 2

B.3 THICKNESS OF PLYWOOD BOARDS BWR - GRADE

TOLERANCES:

The following tolerances on the nominal sizes of finished boards shall be permissible.

Dimension	Tolerance
a) Length	: + 6mm/-0 mm
b) Width	: + 3mm/-0 mm.
c) Thickness	
1) Less than 6mm	: ñ 10%
2) 6mm and above	: ñ 5%
d) Squareness	: 0.2%
e) Edge straightness	: 0.2%

The plywood when tested in accordance with IS:1734 (part-6) shall have an average and a minimum individual shear strength, not less than the values shown in table 3.

TABLE - 3

		TECHNICAL DATA		
Sl	Characteristic	Unit	Requirement	Test method
1.	Glue Shear Strength Dry State - Min	N	Average :1350 Individual,min:1100	IS:1734 (part-4).
2.	Mycological Test	N	Average :1000 Individual,min:800	IS:1734 (part-7)
3.	Water Resistance Test	N	Average :1000 Individual,min:800	IS:1734 (part-6)
4.	Moisture Content	percent	5 to 15	IS:1734 (part-1)

PERMISSIBLE DEFECTS:

Gaps in cores and cross-bands may be permitted except for 3 ply plywood, provided the width of the gap does not exceed 1mm in case of and 2 mm in case of plywood of more than 5 ply and provided such gaps, if more than one, shall be spaces not less than 80mm away from each other and are staggered not less than 50mm away as between ply, the next ply having the same grain direction.

WORKMANSHIP AND FINISH:

The plywood boards shall be of uniform thickness within the tolerance limits specified under 8.3 of IS:303.

The faces of plywood boards shall be reasonably smooth and face veneers shall be reasonably uniform thickness. Slight sanding may be given to rough boards in order to make them reasonably smooth. The squareness and edge straightness of the board when measured according to procedure given in Annex C shall be as given in 8.3 of IS:303.

TESTS:

Six test pieces, cut from each of the boards selected under 10.1 shall be subjected to the tests specified in 11.2 and 11.3.

BHEL

PLANT STANDARD

ANNEXURE TO ED0490092

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GLUE ADHESION:

Glue adhesion shall be deemed satisfactory if the plywood complies with the requirements specified in 11.2.1, 11.2.2 and 11.2.3.

GLUE SHEAR STRENGTH IN DRY STATE:

The plywood when tested in accordance with IS 1734 (Part 4) shall have an average and a minimum individual shear strength not less than the values specified in table 4 against each grade.

MYCOLOGICAL TEST:

The plywood when tested in accordance with IS 1734 (part 7) shall have an average and a minimum individual shear strength, not less than the values shown in Table 4 against grade.

WATER RESISTANCE TEST :

The plywood when tested in accordance with IS 1734 (part 6) shall have an average and a minimum individual shear strength, not less than the values shown in Table 4 against grade.

MOISTURE CONTENT:

The plywood when tested in accordance with IS 1734 (part 1) shall have a moisture content not less than 5 percent and not more than 15 percent.

For the purpose of tests specified in 11.2 & 11.3 of IS:303 the mean of all the observations and the minimum individual value of the observations shall be reported in the form given in Annex D of IS:303.

OTHER TESTS:

For testing any other mechanical property of general purpose plywood, subject to agreement between the purchaser and the supplier, reference shall be made to the provisions of IS 1734 (Part 1 and 20)



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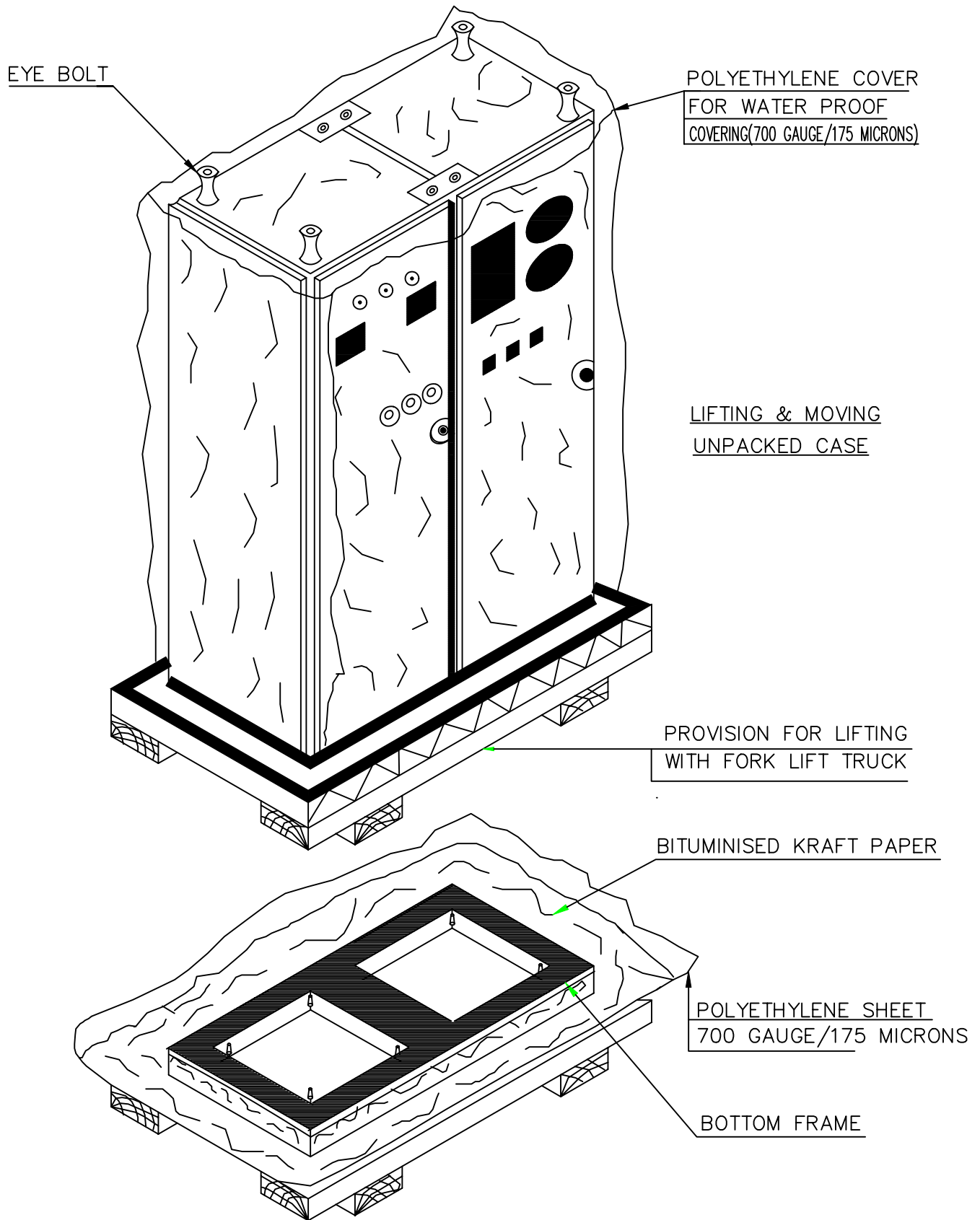


FIGURE-1



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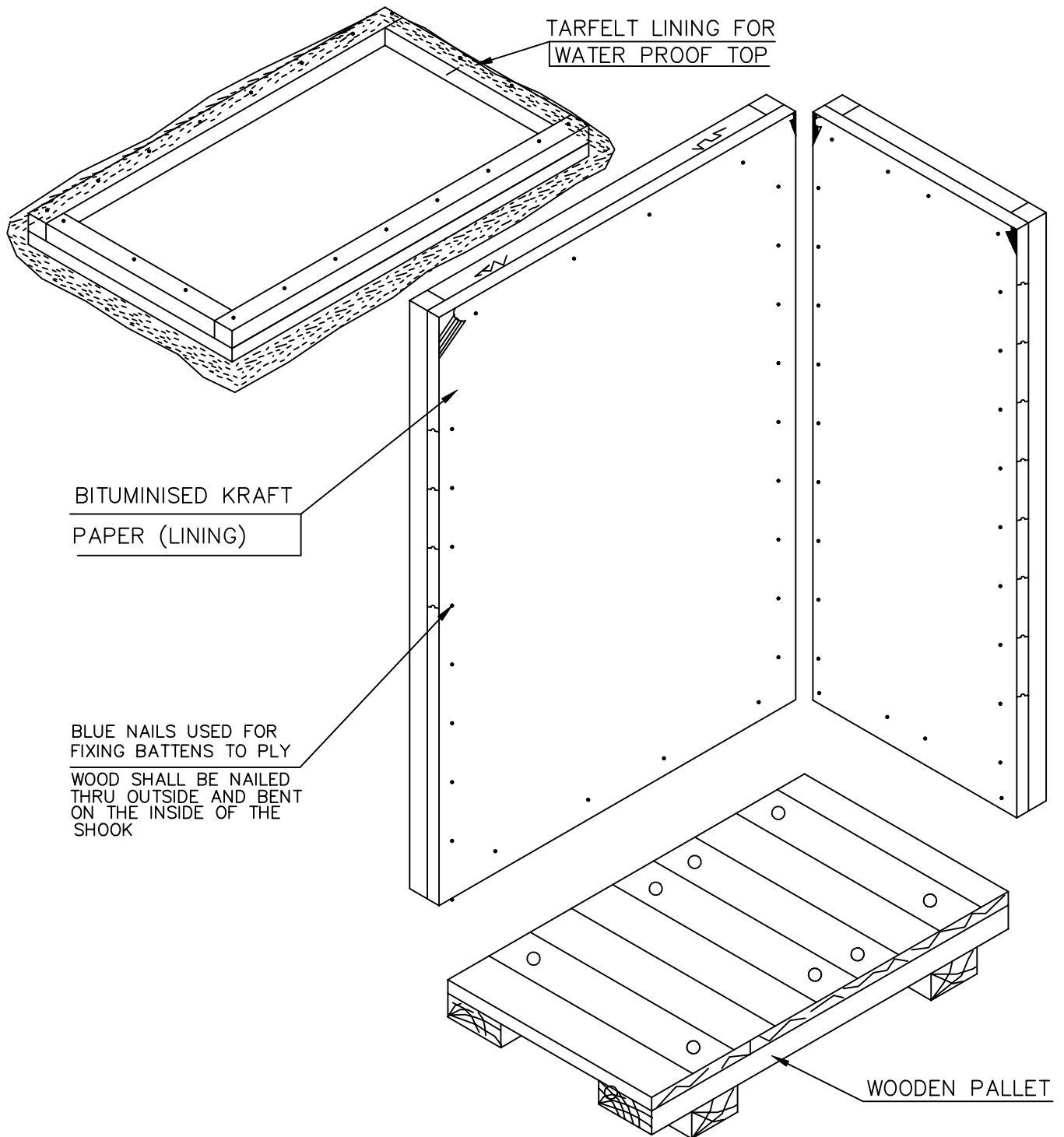


FIGURE-2



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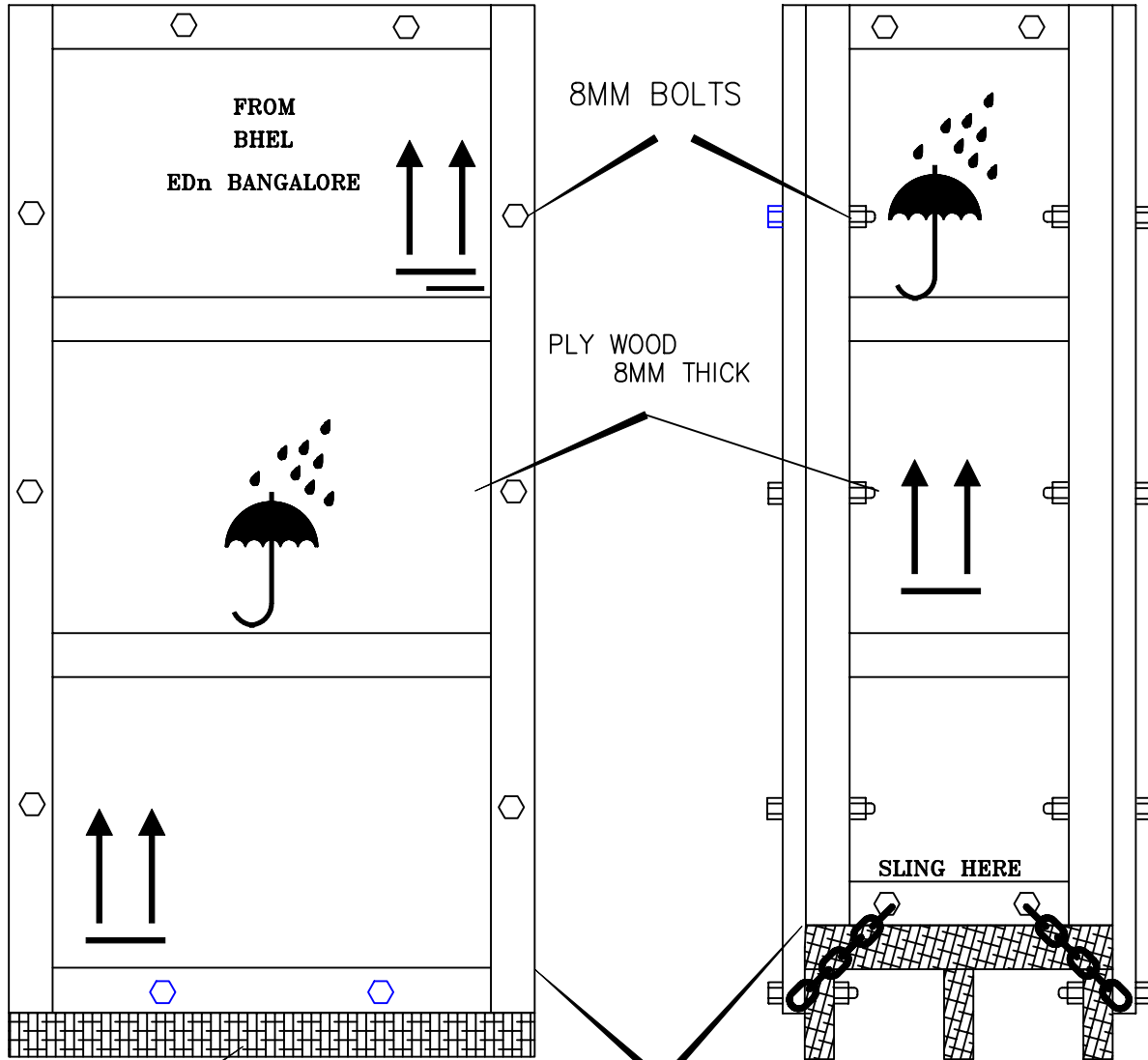
		BHEL-EDN-BANGALORE-26			
CONSIGNEE					
MATERIAL					
CUSTOMER REF.			MO. NO.		
DESPATCH ADVICE NOTE NO.			CASE NO.		
DIMENSIONS(MM) LXBXH			NET WT -KGS	GROSS WT -KGS	
SPECIAL INSTRUCTIONS	HANDLE WITH CARE - KEEP DRY DO NOT DROP - DO NOT TILT				

FIG-3 : MARKING PLATE

PLYWOOD SHOOKS BOLT TYPE WITH SILVER OAK BATTONS

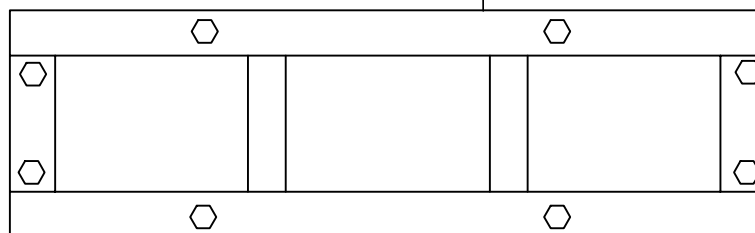
FRONT VIEW

SIDE VIEW



45X45 MM SILVER OAK WOOD

PALLET



TOP VIEW

FIG-4

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LAP JOINTS

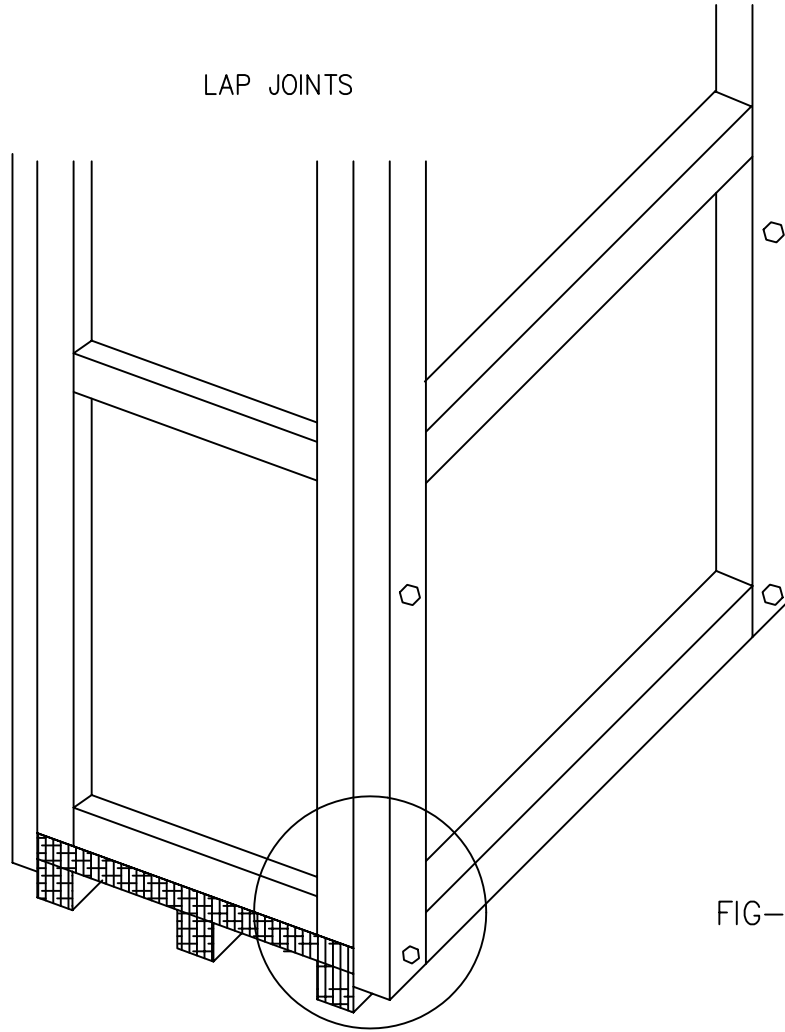
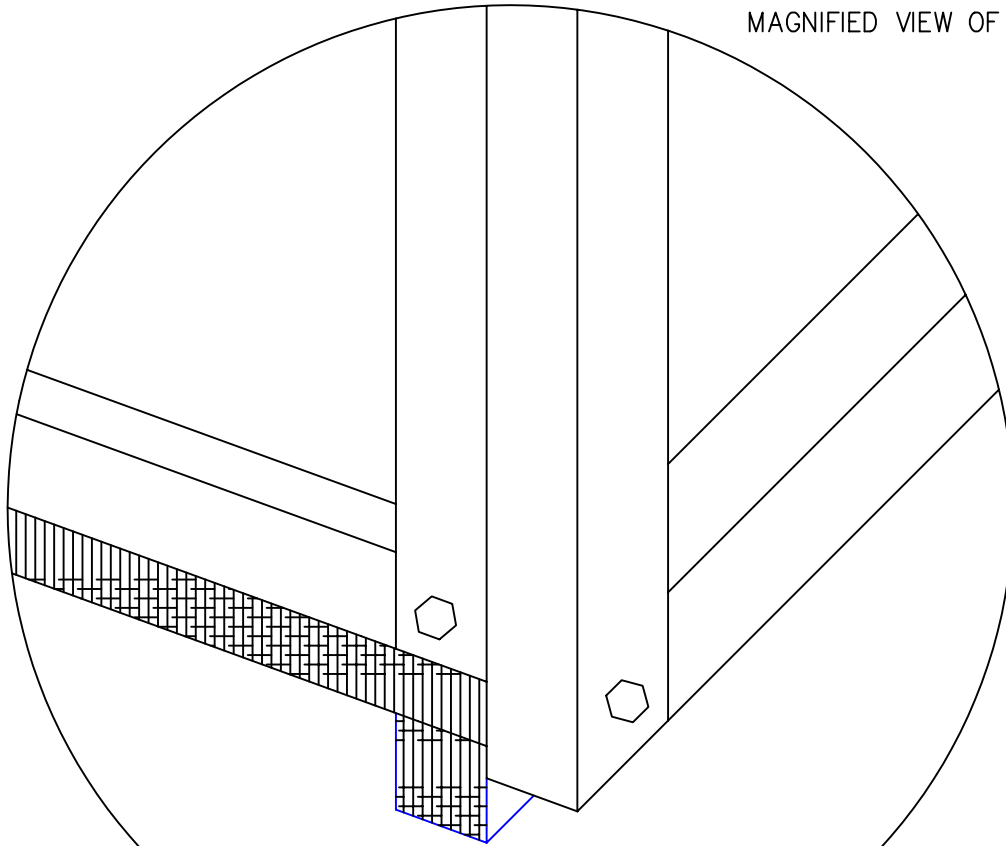


FIG-5

MAGNIFIED VIEW OF THE LAP JOINT



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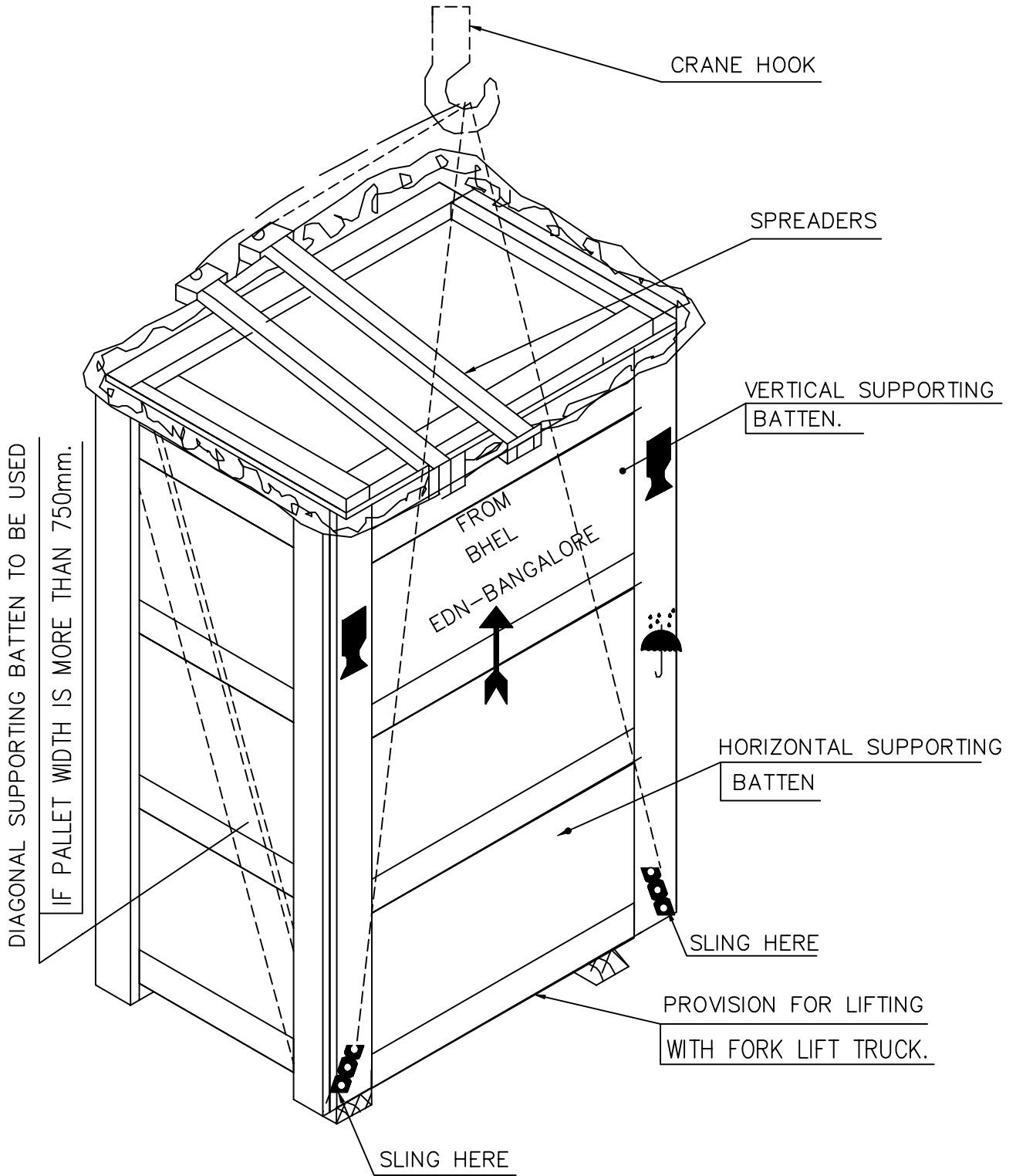


FIG-6 : LIFTING OF PACKED CASE

Annexure – C

Procedure for Packing of Materials in corrugated cartons:

1. Meters: [Unit and Bulk Cartoning]:

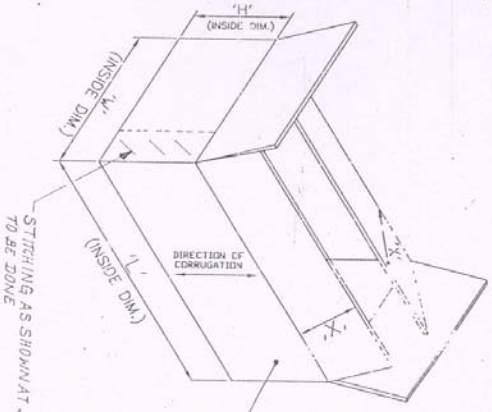
1.1 Scope of work of Bulk Cartoning Packing of Meters

- 1.1.1 Receipt and collection of Meters (Packed in unit Carton) from Production, moved to shipping Packing area.
- 1.1.2 Cleaning / removing any dust accumulated on the meters.
- 1.1.3 Segregating meters on party wise and rating wise.
- 1.1.4 Carton wise placement of meters and writing serial numbers of meters in Packing notes and entering other required informations in the packing note.
- 1.1.5 Packing of Meters in respective CFB Bulk Cartons as per drg. No.3 680 01 00077 and Product Standard for packing of meters EG 42124 REV 00 and size of Bulk Cartons is subject to change from time to time.
- 1.1.6 Place one copy of Packing note inside the carton and closing the flaps with Gum Tape & PVC Straps (half inch) and MS Clips.
- 1.1.7 Meters inside the Carton should not kept loose and empty space if any is to be filled with cushioned material.
- 1.1.8 Marking in the Carton number and other details on the carton by water proof ink (Green or Black colour).
- 1.1.9 Arranging / Stacking neatly all packed cartons party wise in safe place and cover with tarpaulins.
- 1.1.10 Meters have to be handled very carefully while packing.
- 1.1.11 For requirement of different types of cartons, you are required to contact Meters-Commercial In charge for advance procurement of the same.
- 1.1.12 Quality of the packing materials before using are required to be checked.
- 1.1.13 As per our requirement these cartons have to be made available well in advance.
- 1.1.14 In certain cases meters will not be packed in bulk cartons, but dispatched / sent in unit Packing itself i.e., in Loose conditions, in such cases loading of the same to Car, Tempo or Van will have to be done by the Contractor.

1.2 Scope of work for Unit Packing and Supply of individual unit CFB Cartons:

- 1.2.1 Receipt and collection of Meters from Production and moved to safe working area.
- 1.2.2 After Sealing of the meters and as per requirement of Production and Commercial, Meters have to be packed in individual suitable corrugated CFB cartons as per product standard for packing of meters EG 42124 REV 00. Size of unit CFB Carton to be selected is depending on individual meters to be packed.
- 1.2.3 Each CFB carton after keeping the meter inside should be sealed by using BOPP tape. The serial number of meters shall be noted down before sealing the carton.
- 1.2.4 These cartons have to be made available well in advance based on the requirement of Production and Commercial requirement. You may please contact DGM-Production and DGM or Sr.DGM-Comml / Meters for planning and procurement of these cartons and monthly requirement of the same.
- 1.2.5 Applicable drawings can be had from Production or Commercial Groups.
- 1.2.6 After Packing, all the packed meters have to kept neatly or stacked neatly safely party wise and rating wise and to be covered with tarpaulins. Tarpaulins will be provided by BHEL.
- 1.2.7 Sometimes where no sealing is involved, meters have to be packed individually in the production area itself and moved to Shipping / Stores for storing safely.
- 1.2.8 Before supply of Cartons, Quality of Packing materials has to be ensured as per our packing specifications / drawings.
- 1.2.9 Sample drawings are furnished below:

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NOTE:— 1) MATERIAL : 3 PLY CORRUGATED FIBRE BOARD OF DELUXE VIRGIN, C GRADE, 16 BF, 100 GSM AS PER IS: 2771.

- 2) FLUTE TYPE : B (NANDYW)
- 3) STYLE : UNIVERSAL TYPE
- 4) COBB VALUE : Max. 155 g/sqm
- 5) BURSTING STRENGTH : Min. 4 kg/sqcm
- 6) SAMPLES OF CARTON SHOULD BE FORWARDED TO BHEL-SDM FOR APPROVAL BEFORE COMMENCEMENT OF BULK SUPPLY

SCALE = N.T.S.

REV	DATE	ALTERED DRAWING NO.	REV	DATE	ALTERED DRAWING NO.
05	10/12/05	368005	05	11/2/06	368005
		ADDED ITEM NO. 05			ADDED ITEM NO. 04

REV	DATE	ALTERED DRAWING NO.	REV	DATE	ALTERED DRAWING NO.
05	10/12/05	368005	05	11/2/06	368005
		FOR KEYS DIMS IN TERNIS			ADDED ITEM NO. 04

ITEM NO.	DESCRIPTION	QTY	UNIT	REMARKS
06	AS PER DRAWING NO. 265±0	200±2	UNIT PACK FOR PRE-PAID METER WITH METER BOX	
05	AS PER DRAWING NO. 215±2	163±2	UNIT PACK (BMS)	
04	AS PER DRAWING NO. 370±2	330±2	UNIT PACK 3-1/2 SA TWM	
03	AS PER DRAWING NO. 210±2	158±2	UNIT PACK	
02	AS PER DRAWING NO. 320±2	130±2	UNIT PACK B 84-F	
01	AS PER DRAWING NO. 215±2	163±2	UNIT PACK B 84-F	

CARTON

36800500098

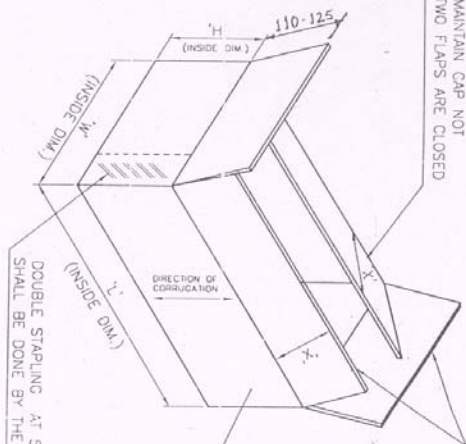
57000 50 089 3
ON SHINYARD

ALL DIMENSIONS ARE IN mm

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X SHOULD BE SO CHOSEN TO MAINTAIN GAP NOT EXCEEDING 1 MM WHEN THESE TWO FLAPS ARE CLOSED



IDENTICAL FOUR FLAPS SHOULD BE PROVIDED AT THE BOTTOM ALSO.

FOR PRINTING INFORMATION REFER TABLE DIMENSIONS TO BE SUITABLY ADJUSTED

NOTE: - SAMPLES OF CARTON SHOULD BE FORWARDED TO SHEL (EDN) FOR APPROVAL BEFORE COMMENCEMENT OF BULK SUPPLY

MATERIAL: STICK DOUBLE WALLED CORRUGATED FLAKE BOARD FLUTES 'B' VERGAIN KRAFT PAPER TO IS: 2771 PART 1

SCALE=1:1.5

ITEM NO	PRINTING INFORMATION	USED FOR PACKING	DIM 'L'	DIM 'W'	DIM 'H'	BURSTING STRENGTH MIN.	GRAVAGE
02	AS PER DRAWING NO. 3 680 05 00044	AIR BUBBLE POUCH	365 ⁺² ₋₀	210 ⁺² ₋₀	105 ⁺² ₋₀	6.0 Kgs/sq.Cm	80-90 GSM
01	AS PER DRAWING NO. 3 680 05 00044	THERMOGLE INSERTS	365 ⁺³	220 ⁺³	130 ⁺³	6.0 Kgs/sq.Cm	80-90 GSM

H/S. HPER D RSEB)
(Metallic Base & Cover)

REV	DATE	ALTERED BY	CHKD	APPROVED	REV	DATE	ALTERED BY	CHKD	APPROVED	FORM NO.	REV
02	9.2.06	CHANDRA	CHANDRA	CHANDRA	01	21.06.07	CHANDRA	CHANDRA	CHANDRA	FORM NO. 1000	02
<p>ADDED ITEM NO. 02</p> <p>FORMERLY DIMENSIONS 365 x 220 x 130 WERE 370 x 225 x 145 RESPECTIVELY.</p>											

DEPT CODE	421	TITLE	BHARAT HEAVY ELECTRICALS LIMITED, ELECTRONICS DIVISION, BANGALORE	DRAWING NO.	3 680 05 00045
EDG	421		(3 Ph 40 A ELECTRONIC METER)	SHEET NO.	NO OF SHEETS

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FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

3 680 05 00017

INVENTORY NO	SIGN & DATE	REF. DRG. NO.			
REV. 01	DATE 10.8.24	ALTERED BY <i>[Signature]</i>	REV. 02	DATE 6.2.06	ALTERED BY <i>[Signature]</i>
FORMERLY DIM. 120 MM DIA.			ADDED TABLE		
DRWN	CHKD	APPRD	NAME	SIGN	DATE
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	M. S. MISEB	<i>[Signature]</i>	28.8.71
DISTRIBUTION OF PRINTS					
DEPT	CODE	VO NO			
ENG	421	3 680 05 00017			

STITCHING AS SHOWN AT 5 PLACES IS DONE BY THE SUPPLIERS

NOTE:

- SIX SAMPLES OF CARTON COMPLETE IN EVERY RESPECT SHOULD BE FORWARDED TO SHELD. EN. BEFORE TAKING UP THE BULK SUPPLY.
- PRINTING TO BE DONE AS PER DRG. NO. 36800500018

MATERIAL:

5MM THICK 5 PLY 'B' TYPE FLUTED DOUBLE WALL CORRUGATED FIBRE BOARD VERGIN KRAFT PAPER TO IS:2771 PART-I

BURSTING STRENGTH MINIMUM: 5KG/CM. SQ.

GRAMMAGE: 100 GSM

M/S. MISEB Ampson Base & Cover

M/S. HSE B & RSE B (Meters)

(Ampson Base & Cover)

@ [Signature]

ITEM NO	A	B	C	USE D FOR PACKING
02	318	187	105	AIR BUBBLE POUCH
01	326	193	120	THERMO-COLE INSERTS

BHARAT HEAVY ELECTRICALS LIMITED
 ELECTRONICS DIVISION, BANGALORE

CARTON

CHNO CODE

NO. OF SHEETS 01

REV 02

ENR/DO/01/P

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FORM NO. AH-02

REV.	DATE	ALTERED	CHECKED	APPROVED
1001	30/11/04	+	+	+
30	10/03/04	-	-	-
10	30/02/04	-	-	-
10	10/01/04	-	-	-

GENERAL DIMENSIONS

GENERAL TOLERANCES

DRAWING NO. 3 680 05 00114

ALL DIMENSIONS ARE IN MM

THE STITCHING AT 7 TO 9 PLACES ON EACH SIDE SHALL BE DONE BY THE SUPPLIER

GAP SHALL NOT BE MORE THAN 3MM WHEN FLAPS ARE CLOSED

FOR PRINTING INFORMATION REFER TABLE

ITEM NO. DIM. 'A' DIM. 'B' DIM. 'C' PRINTING INFORMATION (DWG NO.) USED FOR

04	460 \pm 5	395 \pm 5	360 \pm 5	36800500115	6 NOS. OF P/PH. ELECTRONIC METER WITH AIR BUBBLE POUCH & CARTON (MIS. MS&S) (METALLIC BASE & COVER)
03	340 \pm 5	350 \pm 5	345 \pm 5	36800500115	6 NOS. OF P/PH. ELECTRONIC METER WITH AIR BUBBLE POUCH & CARTON (MIS. MS&S) (NON-METALLIC BASE & COVER)
02	410 \pm 5	340 \pm 5	360 \pm 5	36800500115	6 NOS. OF P/PH. ELECTRONIC METER WITH AIR BUBBLE POUCH & CARTON (MIS. MS&S) (NON-METALLIC BASE & COVER)
01	365 \pm 5	485 \pm 5	250 \pm 5	36800500018	6 NOS. OF P/PH. ELECTRONIC METER WITH AIR BUBBLE POUCH (RSEB/MP&B)

NOTE: 1. SIX SAMPLES OF CARTON SHALL BE FORWARDED TO BHEL-ENR. BEFORE MAKING UP BULK SUPPLY.
2. THE VOID (IF ANY) BETWEEN METER AND CARTON TO BE FILLED WITH PAPER SHREDDING.

MATERIAL	BUSTING STRENGTH	GRAMMAGE
7TH. 7 PLY B TYPE FLUTED DOUBLE WALL CORRUGATED KRAFT PAPER TO IS:2771-PART-1.	10 Kg/cm ²	120 GSM

REV. DATE ALTERED CHECKED APPROVED

01 17/2/06 APPROVED

APPROVED ITEM NO. 02, 03, 04

THE PRODUCT OR NAME OF CUSTOMER/PROJECT

DEPT. 421 CODE ENG

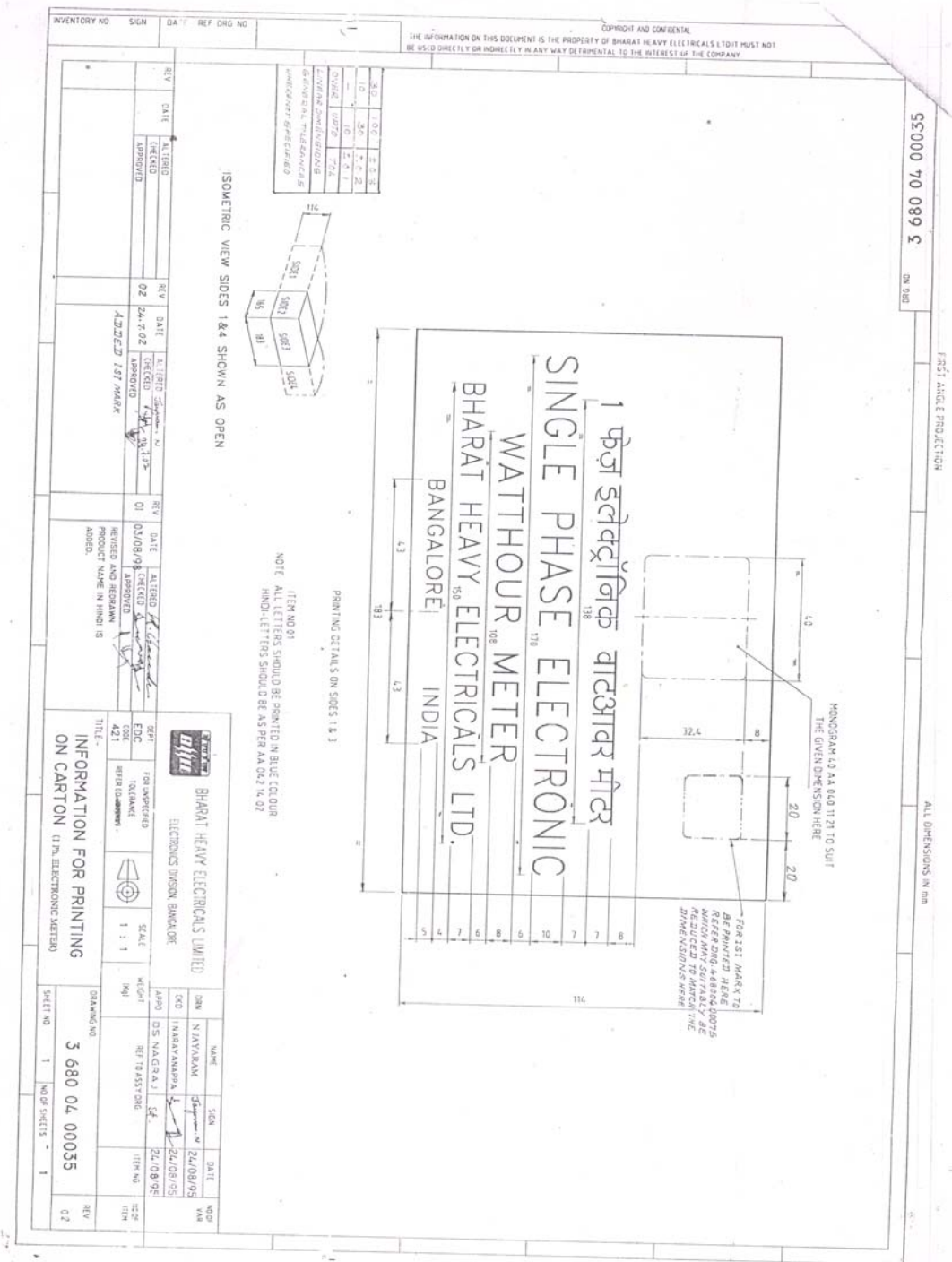
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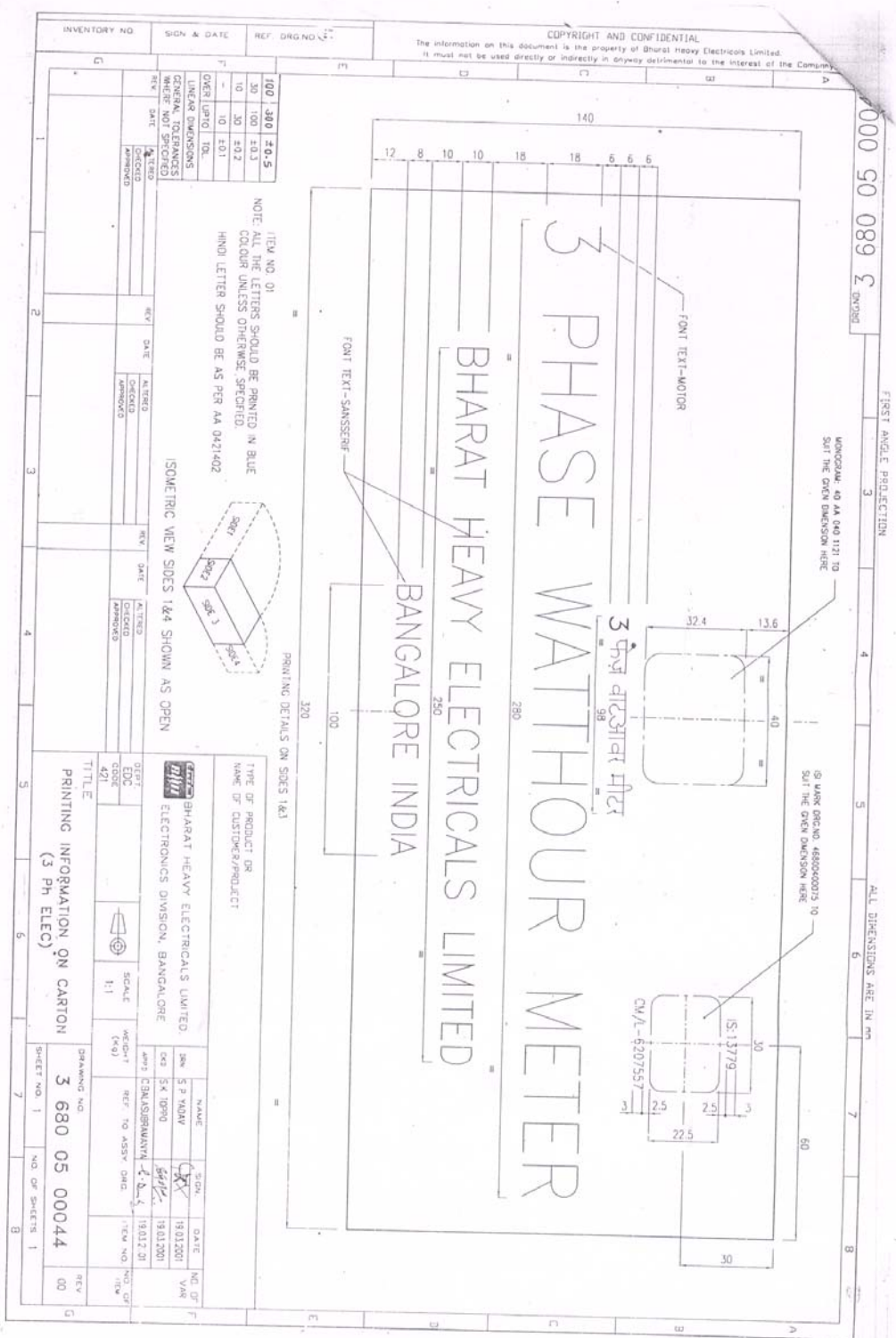
DRIVING NO. 3 680 05 00114

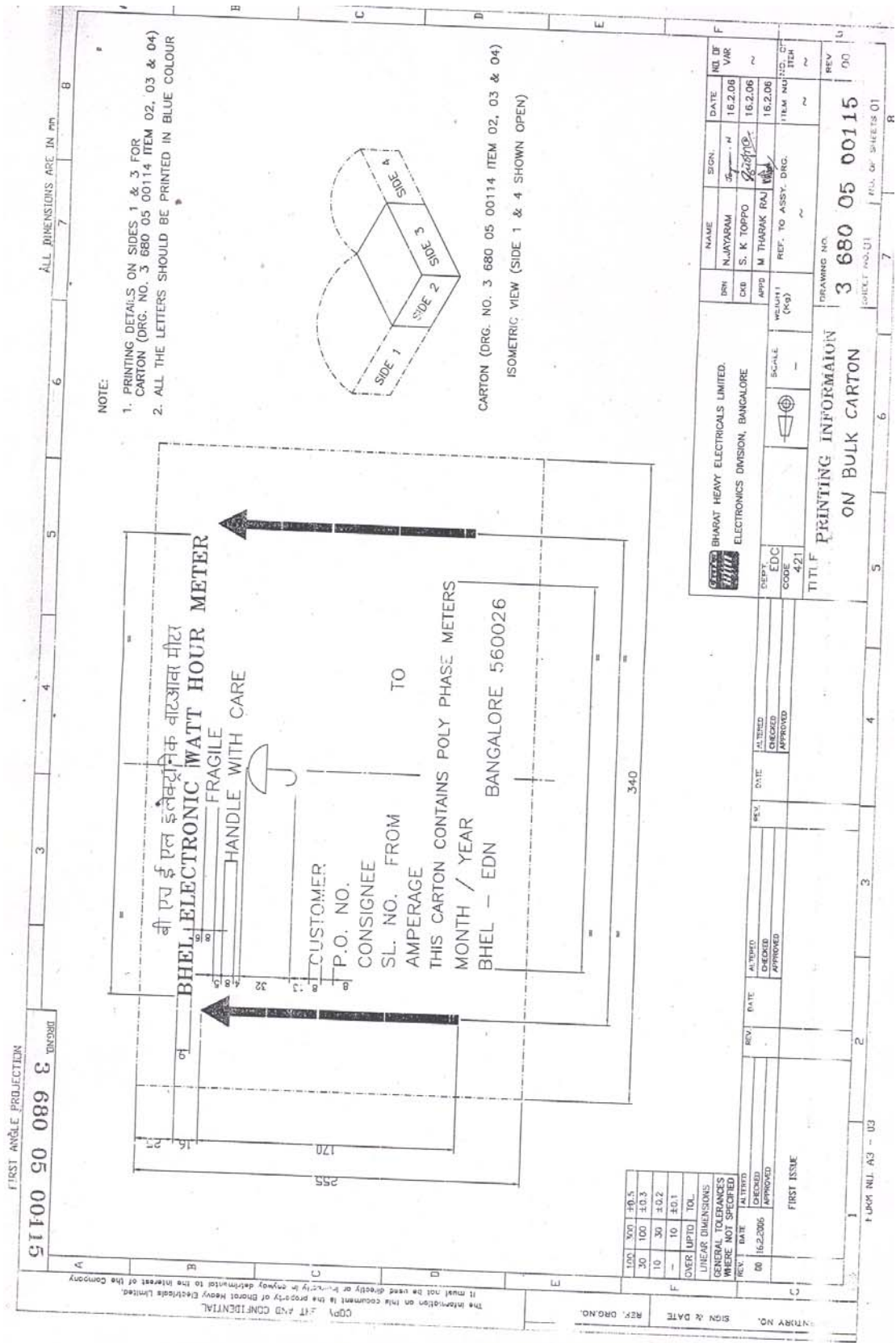
SHEET NO. 01

NO. OF SHEETS 01

A4 SIZE







2. Accessories ,Components and other items :

- 2.1 Receipt of items and removal of dust using compressed air .
- 2.2 Items have to be enclosed / wrapped in polythene cover of 700G with heat sealed or stapled.
- 2.3 Place the wrapped items inside the carton of suitable size and provide sufficient qty of suitable cushioning materials such as coir / thermocole sheets. Thermocole sheets will be provided by BHEL.
- 2.4 Provide one bag / pkt of Silicagel of 50 grams for small box and 100 grams for big one . This is required for moisture absorption.
- 2.5 Place one copy of packing list duly signed by shipping and QC officials inside the carton after enclosing in a plastic cover.
- 2.6 Close the top flaps with BOPP self-adhesive tape and strap the carton with half an inch pvc straps and clips. [2 + 2 straps].
- 2.7 If necessary, one additional outer polythene cover is required for the carton at an extra cost.
- 2.8 Labeling address and suitable markings to be provided by using labels / stickers / indelible ink.
- 2.9 Weight of the carton to be indicated after weighment.
- 2.10 Stacking of cartons party wise for easy retrieval.
- 2.11 Required cartons sizes will be informed well in advance for procurement.
- 2.12 For other relevant details please refer our plant standard.

3. CE Panels:

Specification and Procedure for Packing of Panels using heavy Duty carton and other packing materials.

3.1 Raw Materials per box:

- 3.1.1 Heavy Duty Corrugated Board [Sleeve]
- 3.1.2 Rotolock – 12 nos
- 3.1.3 Antistatic Polythene cover [700 Gauge] for panel size
- 3.1.4 Edge Protector – 10 nos

- 3.1.5 5 ply cap made out of corrugated board – 1 no
- 3.1.6 33 ply Dunnage [corrugated kraft paper board] size : 1000 x 100 mm ,qty- 18 nos of suitable thickness.
- 3.1.7 Polythene outer cover 700 gauge - 1 no
- 3.1.8 Silicagel – 1 kg per panel
- 3.1.9 Stickers / labels
- 3.1.10 Document Pouch A4 – 1 no
- 3.1.11 PVC strappings - size : 0.5 inch – 6 nos
- 3.1.12 Stretch films
- 3.1.13 Commercial plywood sheet 12 mm thick – 1 no , on top of the panel inside the carton for providing reinforcement while loading.

3.2 Specifications:

3.2.1 Heavy Duty Board: [Sleeve]

- Paper combination : 440/175/200/175/200/175/280 GSM
- Board Weight : approx . 2000 GSM
- No. of Ply : 7
- Board Thickness: 15 mm
- Bursting Strength: 41 kg/cm²
- Puncture Resistance : 37.19 l
- Moisture Content : 8.3 %
- Cobb Test: 110 g/m² - [The qty of water absorbed by or through the outside liner of corrugated board in a specified time is an indicator of water reistance]
- Edge Crush Test: 16.2 KN / m
- Compression load can vary between 500 kgs to 1500 kgs depending upon the footprint and height of the box.
- Ph value combined board : Exceeds 5.5

Test Conditions:

- 27 deg C and 65 % or nearest Relative humidity.
-

3.3 Procedure for Packing:

- 3.3.1 Panels shall be protected in a manner to prevent both damage and corrosion during transit.
- 3.3.2 Panel will be fitted on the pallets.
- 3.3.3 Suitable reepers to be provided on the pallet to arrest the movement of the panel .
- 3.3.4 Remove the dust and clean with compressed air.
- 3.3.5 Silicagel shall be kept inside the panel at different places in 2 or 4 bags in the ratio of 1 kg per panel.
- 3.3.6 Corners and any protruding part shall be additionally protected.
- 3.3.7 VCI [Vapour Corrosive inhibitors] covers will prevent panels from corrosion [optional]
- 3.3.8 Place one copy of Packing List duly signed by the BHEL officials.
- 3.3.9 Anti static cover shall be put to protect the panel from static current.
- 3.3.10 Dunnage 's inside the box shall be provided for cushioning effect for panel during transit. 33 ply dunnage of size 1000 x 100 x 33 mm thick.Insert these dunnages while stretch wrapping.
- 3.3.11 Wrap the stretch film all around the panel.
- 3.3.12 Additional strapping shall be used to ensure no part become loose or detached during transportation.
- 3.3.13 Final heavy duty board [Sleeve] strapped arrond the panel along with the pallet.
- 3.3.14 Lock the sleeve with rotolocks [6 nos]
- 3.3.15 Place the cap over the sleeve.
- 3.3.16 Required labeling and markings have to be done.
- 3.3.17 Place paste / stick one copy of packing list at outside the box.
- 3.3.18 Place outer polythene cover of 700 gauge around the carton.
- 3.3.19 Strap the box along with the pallet , first two straps have to be put circumferencially on the box , next two straps from front to back , and finally two straps have to be put on side wise.
- 3.3.20 Finally stretch film wrap the whole box.

3.3.21 Sample photos are attached for ready reference.

Steps of packing for [REDACTED] control panel.

1. Bare panel mounted on the pallet with anchoring bolts.



01

2. Clean the panel with compressed air.



02

3. Put the polyethylene cover on the panel, stretch wrap the panel and insert the 33 ply dunnage while stretch wrapping, care should be taken for giving extra protection for glass door.



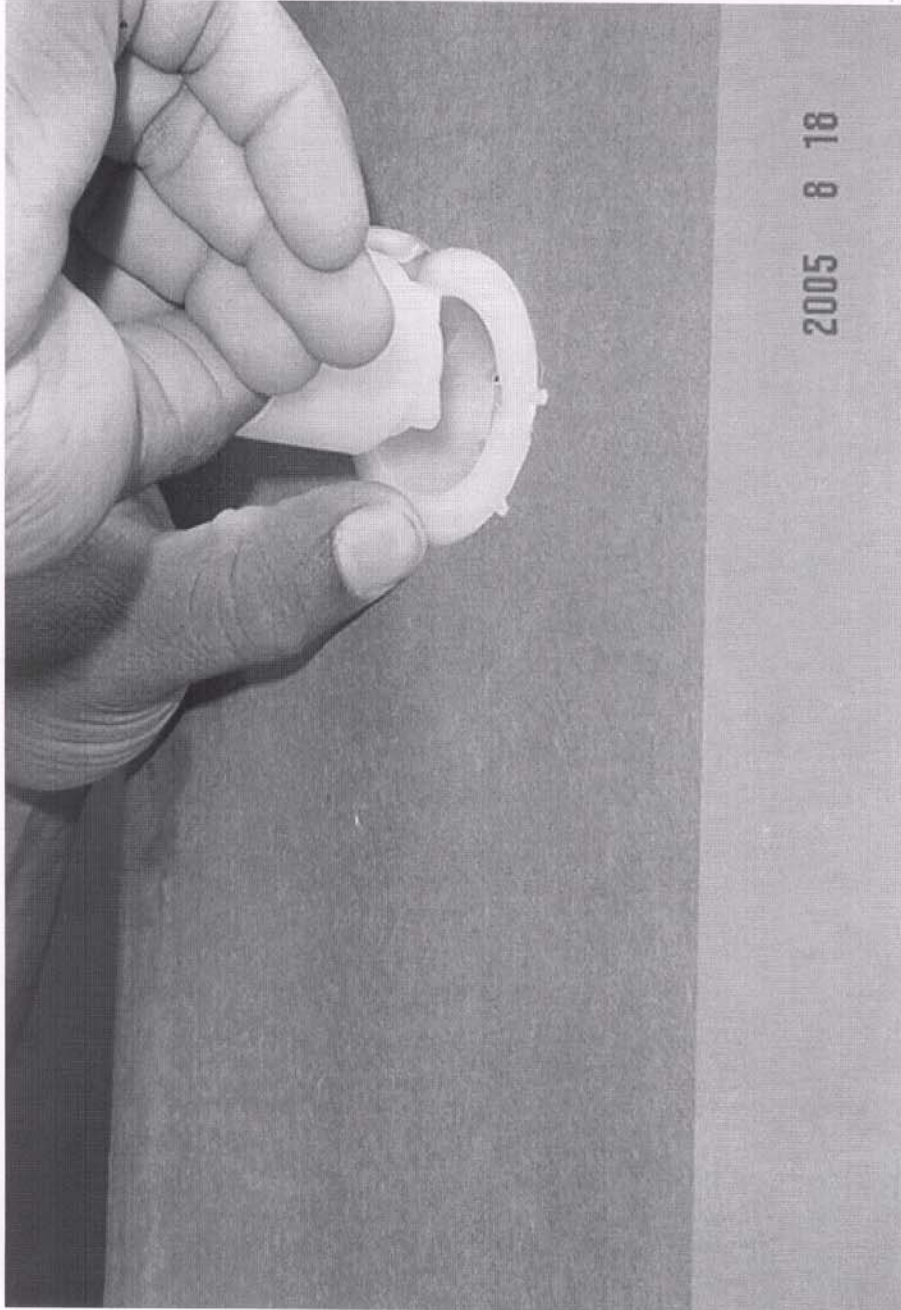
03

4. Wrap the sleeve around the control panel above the pallet.



04

5. Lock the sleeve with rotolocks (6 Nos.).



05

6. Place the cap over the sleeve.



06

8. After the printing ink is dried put the polyethylene cover on the box.



07

9. Strap the box along with the pallet, first two straps has to be put circumference of the box next two straps are put from front to back of the box and finally two straps has to be put in side wise. Then finally stretch wrap the whole box.



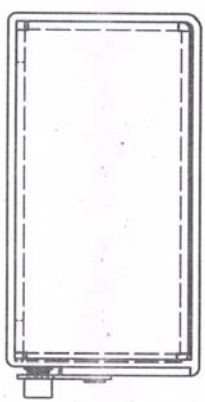
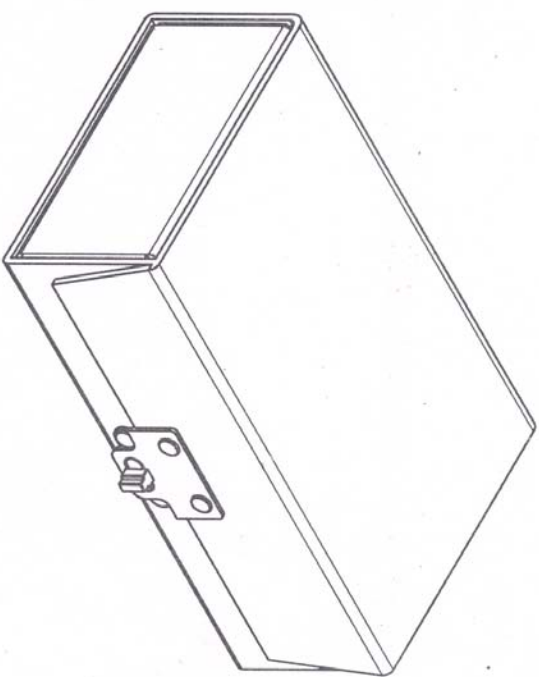
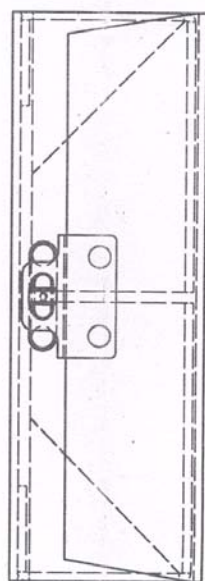
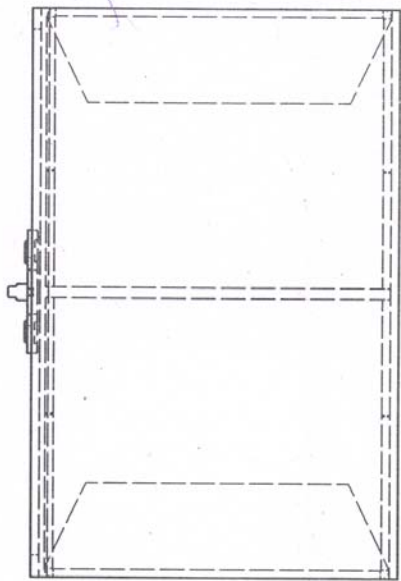
08

Annexure – D

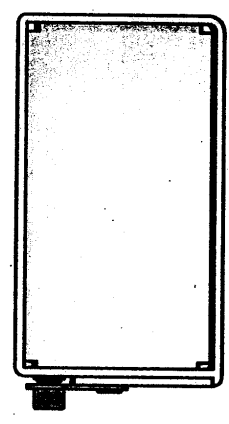
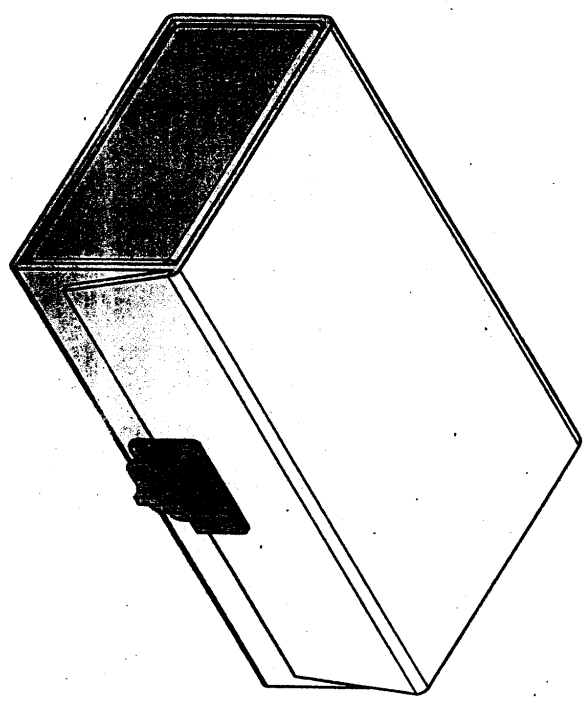
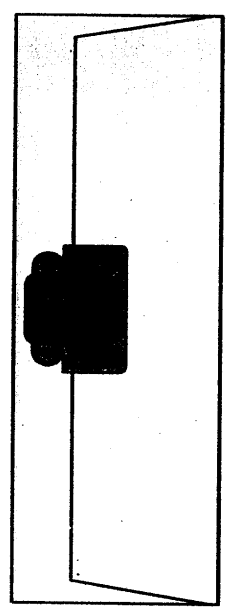
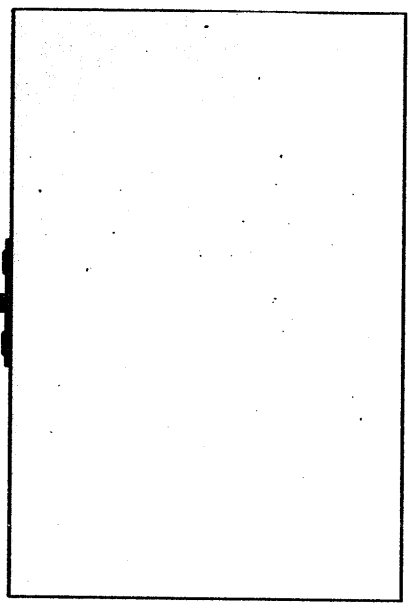
1.0 Procedure for Packing of Loose items , CE spares and other items using SUN-PAC PVC sheet and other pkg materials.

- 1.1 Receipt of items and removal of dust using compressed air.
- 1.2 Items have to be enclosed / wrapped in polythene cover of 700G with heat sealed or stapled.
- 1.3 Place the wrapped items inside the carton of suitable size and provide sufficient qty of suitable cushioning materials such as coir / thermocole sheets. Thermocole sheets will be provided by BHEL.
- 1.4 Provide one bag / pkt of Silicagel of 50 grams for small box and 100 grams for big one . This is required for moisture absorption.
- 1.5 Place one copy of packing list duly signed by shipping and QC officials inside the carton after enclosing in a plastic cover.
- 1.6 Close the top flaps with BOPP self-adhesive tape and strap the carton with half an inch pvc straps and clips. [2 + 2 straps].
- 1.7 If necessary, one additional outer polythene cover is required for the carton at an extra cost.
- 1.8 Labeling address and suitable markings to be provided by using labels / stickers / indelible ink.
- 1.9 Weight of the carton to be indicated after weighment.
- 1.10 Stacking of cartons party wise for easy retrieval.
- 1.11 Required cartons sizes will be informed well in advance for procurement.
- 1.12 For other relevant details please refer our plant standard.
- 1.13 Sample sketches are shown for ready reference.

SAMPLE SKETCH



SAMPLE SKETCH



2.0 SPECIFICATIONS OF “SUNPAC”

A. STANDARD SIZES AND WEIGHT :

Sheet Thickness	<u>Weight</u>
1.5 mm	410 g/m ²
2	440 g/m ²
3	500 g/m ²
4	635 g/m ²
5	770 g/m ²

Other thickness and weights can be supplied depending on volume of the business.

Normal Width : 1.3 Metres (Maximum)
Normal Length : 2 Metres (Maximum up to 3 M)

It is possible to manufacture sheets in longer lengths subject to certain conditions.

B. COLOURS AVAILABLE: Opaque, Blue, Black, White, Brown, Red, Orange, Yellow and Green.

Available in Translucent : Clear, Green and Red.

Non-Standard Colours can be supplied against minimum order for 1000 sheets in Standard size.

C. OTHER SPECIFICATIONS :

1. Squareness of Sheet:

Maximum allowable “Out of Square” Measurement. 10 m Square table.

2. Tolerance on normal length / width at sheet + 5 m steel rule or tape.

2. Variation on normal weight of the sheet + 5%

D. SURFACE TREATMENT : Sheet are “Corona” treated for printing purpose.

Target Level	40 dynes / Cm
Minimum Level	35 dynes / Cm
Measurement	ASTM D – 2578 / 67

E. SUNPACK SHEET SPECIFICATIONS:

Sl. No.	Properties	Units	Thickness			
			2 m	3 m	4 m	5 m
01.	Puncture Resistance	OZS/INCH	355	-	632	698
02.	Bursting Strength	Kg.	12.2	Does not Burst (elongates)	Does not Burst (elongates)	Does not Burst (elongates)
03.	Edge Crush	Kg/10 cms	65	71	95.7	114
04.	Load bearing capacity For boxes (compression)					
	a. 60 x 40 x 50 cms		-	-	298	466
	b. 54 x 23 x 36 cms		-	-	221	300
	c. 46 x 33 x 46 cms		-	137	200	280

F. MATERIAL PROPERTIES OF RESIN :

Used for the production of Sunpac

Property	ASTM Test	Units	Value
Melt Index	D1238-65T Cond. L	6/10 min	0.75
Tensile Strength	D 638-67 T	kg./cms	285
Elongation at break	D 638-67 T	0/0	200
Stiffness in Flexure	D 747-63	kg/cm 2	12000
Tensile Strength (at yield)	D 638-67	kg/cms	285
Hardness Rockwell (L scale)	D 785-63	-	58

G. OTHER PROPERTIES:

Property	ASTM Test	Units	Value
Normal Density	ASTM D 1505	gm / cm ³	0.905
Softening Point	B3 2782 : 102 D	o C	145
Brittle Point	D 746-64 T	o C	- 35o
Water Absorption	ASTM – D - 570	%	- 0.02

H. CHEMICAL RESISTANCE :


A. ORGANIC REAGENT

	TEMPERATURE	
	<u>20o C</u>	<u>60o C</u>
Acetic Acid (10%)	Nil	Nil
Acetone	Nil	Nil
Ammonium Hydroxide (10%)	Nil	Nil
Benzene	Slight	Moderate
Carbon Tetrochloride	Moderate	Severe
Citric Acid (10%)	Nil	Nil
Cyclohexanol	Nil	Slight
Detergent (2% liquid)	Nil	Nil
Ethanol (96%)	Nil	Nil
Glycerine	Nil	Nil
Imopropy Alcohol	Nil	Nil
Lactic Acid (20%)	Nil	Nil
Methanol	Nil	Nil
Methy Ethyl Ketone	Nil	Slight
Nitrobenzene	Nil	Nil
Turpentine	Slight	Moderate
Xylence	Moderate	Severe

B. INORGANIC :

Hydrochloric Acid (30%)	Nil	Nil
Hydrogen Peroxide (10%)	Nil	Slight
Nitric Acid (10%)	Nil	Nil
Nitric Acid (70%)	Slight	Moderate
Sulphuric Acid (98%)	Nil	Moderate
Phosphoric	Nil	Nil
Potassium Hydroxide (50%)	Nil	Nil
Water	Nil	Nil
Sulphuric Acid (10%)	Nil	Nil

Annexure - E

	 <p align="center">A4-10</p>	<p align="center">PRODUCT STANDARD ELECTRONICS DIVISION</p>	<p align="center">CD-4-4007-011</p> <hr/> <p align="center">REV. 05</p> <hr/> <p align="center">PAGE 01 OF 02</p>	
<p align="center" style="writing-mode: vertical-rl; transform: rotate(180deg);">COPY RIGHT AND CONFIDENTIAL</p> <p align="center" style="writing-mode: vertical-rl; transform: rotate(180deg);">The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.</p>	<p align="center"><u>Instructions for Packing of PV Modules</u></p> <p>Various types of Photovoltaic Modules shall be packed for despatch to customers as per the following instructions. The specifications for carton box & EP foam fitments for various configurations are as per page 2 of 2.</p> <p align="center"><u>For L1235, L1250, L1270, L24100, L24120 & L24150 PV modules</u></p> <ol style="list-style-type: none"> Place each PV module in a Polythene cover and seal the edges. Place two nos. of L shaped E.P. foam fitment in the bottom corners of carton box and one no. E shaped E.P. foam fitment in the bottom middle of carton box. Position required no. of PV modules in the slots of foam fitments. Fix two nos. of L shaped E.P. foam fitment in the top corners of carton box and one E shaped E.P. foam fitment in the top middle of carton box with each module positioned in the respective slots. Put a packing list slip (sealed / covered in a polythene cover) inside the carton box and paste one more packing list slip on the carton box. Write the packing list number & module sl. nos. clearly on the carton. Close the carton flaps with a bopp tape (2 inch width) at three places in both top and bottom. Place the packed carton box inside a polythene cover. Heat seal the polythene cover openings. Wrap the carton box along with polythene cover tightly with a plastic bale patti (1/2 inch width) at three places. Stack and store the carton boxes in a safe place. <p align="center"><u>For L0606, L1206, L1210 & L1218 PV modules</u></p> <ol style="list-style-type: none"> Place each PV module in a Polythene cover and seal the edges. Place two nos. of L shaped E.P. foam fitment in the bottom corners of carton box. Position required no. of PV modules in the respective slots of foam fitments. Fix two nos. of L shaped E.P. foam fitment in the top corners of carton box with each module positioned in the respective slots. Put a packing list slip (sealed / covered in a polythene cover) inside the carton box and paste one more packing list slip on the carton box. Write the packing list number & module sl. nos. clearly on the carton. Close the carton flops with a bopp tape at the bottom and top at two places. Wrap the carton box tightly with a bale patti at two places. Stack and store the carton boxes in a safe place. <p><u>Plywood box packing in special cases (as required by commercial) :</u> Pack the carton boxes further in ply wood boxes. Plywood is as per IS 303 – BWR / BWP grade (MR grade). Other packing instructions as per plant standard ED0490092. Gaps to be filled with rubberised coir or thermocole or any other cushioning material.</p>			
	<p>REVISION : (05) Packing instructions revised.</p>	<p align="center">APPROVED BY :</p> <p align="center">SS</p>		
		<p align="center">PREPARED</p> <p align="center">SR</p>	<p align="center">ISSUED</p> <p align="center">Engg.</p>	<p align="center">DATE</p> <p align="center">02.12.2005</p>



**PRODUCT STANDARD
ELECTRONICS DIVISION**

CD-4-4007-011

REV. 05

PAGE 02 OF 02

Various types of Packing Specifications

Sl. No.	PV module type	Module dimension (mm)	No. of modules per packing	Spec. for carton box	Spec. for E.P. foam fitment
1.	L0606 (6V,6W)	269*285*22	5	PS-439-055	PS-439-051
2.	L0606 (6V,6W)	269*285*22	10	PS-439-053	PS-439-050
3.	L1206 (12V,6W)	269*285*22	5	PS-439-054	PS-439-051
4.	L1206 (12V,6W)	269*285*22	10	PS-439-052	PS-439-050
5.	L1210 (12V,10W)	464*285*22	5	PS-439-046	PS-439-035
6.	L1210 (12V,10W)	464*285*22	10	PS-438-689	PS-438-688
7.	L1218 (12V,18W)	644*285*22	5	PS-439-047	PS-439-036
8.	L1218 (12V,18W)	644*285*22	10	PS-439-045	PS-439-034
9.	L1235 (12V,35W)	678*528*38.5	2	PS-439-043	PS-439-033
10.	L1235 (12V,35W)	678*528*38.5	4	PS-439-041	PS-439-032
11.	L1235 (12V,35W)	678*528*38.5	5	PS-439-039	PS-439-031
12.	L1250 (12V,50W)	873*528*38.5	2	PS-439-044	PS-439-033
13.	L1250 (12V,50W)	873*528*38.5	4	PS-439-042	PS-439-032
14.	L1250 (12V,50W)	873*528*38.5	5	PS-439-040	PS-439-031
15.	L1270 (12V,70W)	1203*528*38.5	2	PS-439-048	PS-439-037
16.	L1270 (12V,70W)	1203*528*38.5	3	PS-439-058	PS-439-057
17.	L1270 (12V,70W)	1203*528*38.5	4	PS-439-014	PS-439-013
18.	L1270 (12V,70W)	1203*528*38.5	5	PS-438-682	PS-438-681
19.	L24100 (24V,100W)	1144*789*50	2	PS-439-049	PS-439-038
20.	L24100 (24V,100W)	1144*789*50	4	PS-439-025	PS-439-026
21.	L24120 (24V,120W)	1309*789*50	2	PS-439-029	PS-439-030
22.	L24150 (24V,150W)	1594*789*50	2	PS-439-027	PS-439-028

Responsibility :

Packing : By Shipping department.

Verification : QS (Despatch)

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 055

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
6 WATTS (L0606) PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 6 watts (L0606) PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 320 (L) * 220 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 110 mm size on 220 mm width side on top and bottom.

Two flaps of 110 mm size on 320 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
} **Width sides.**

Upward Arrow , Wine Glass, Umbrella Symbol }

SOLAR PV MODULE : L0606

QUANTITY : 5 Nos.

GROSS WT. : 5 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division,
Bangalore, India. (include BHEL logo

in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

This is required on one of the length side.

Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 051

REV.00

A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
6 WATTS PV MODULE (L1206 / L0606) PACKING (5 IN 1)**

Purpose :

This item is used for packing of 6 watts (L1206 / L0606) PV modules (5 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15 mm thickness.

Density : 27 - 35 Kg / M³

Dimensional tolerance : ± 3 mm.

Thickness tolerance : ± 10 %.

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per page 2 of 2.

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REVISION : (00)

APPROVED BY :

SS

PREPARED

ISSUED

DATE

SR

Engg.

16.8.2004



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 053

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
6 WATTS (L0606) PV MODULE PACKING (10 IN 1)**

Purpose :

This item is used for packing of 6 watts (L0606) PV modules (10 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 320 (L) * 410 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 205 mm size on 410 mm width side on top and bottom.

Two flaps of 205 mm size on 320 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both
Width sides.**

Upward Arrow , Wine Glass, Umbrella Symbol }

SOLAR PV MODULE : L0606

QUANTITY : 10 Nos.

GROSS WT. : 10 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division,

Bangalore, India. (include BHEL logo

in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

This is required on one of the length side.

Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 050

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
6 WATTS PV MODULE (L1206 / L0606) PACKING (10 IN 1)**

Purpose :

This item is used for packing of 6 watts (L1206 / L0606) PV modules (10 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15 mm thickness.

Density : 27 - 35 Kg / M³

Dimensional tolerance : ± 3 mm.

Thickness tolerance : ± 10 %.

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per page 2 of 2.

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Engg.

DATE

16.8.2004



A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 054

REV.00

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
6 WATTS (L1206) PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 6 watts (L1206) PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 320 (L) * 220 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 110 mm size on 220 mm width side on top and bottom.

Two flaps of 110 mm size on 320 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
} **Width sides.**

Upward Arrow , Wine Glass, Umbrella Symbol }

SOLAR PV MODULE : L1206

QUANTITY : 5 Nos.

GROSS WT. : 5 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo

in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 052

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
6 WATTS (L1206) PV MODULE PACKING (10 IN 1)**

Purpose :

This item is used for packing of 6 watts (L1206) PV modules (10 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 320 (L) * 410 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 205 mm size on 410 mm width side on top and bottom.

Two flaps of 205 mm size on 320 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
} **Width sides.**

Upward Arrow , Wine Glass, Umbrella Symbol }

SOLAR PV MODULE : L1206

QUANTITY : 10 Nos.

GROSS WT. : 10 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division,
Bangalore, India. (include BHEL logo

in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 046

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
10 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 10 watts PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 515 (L) * 220 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 110 mm size on 220 mm width side on top and bottom.

Two flaps of 110 mm size on 515 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1210

QUANTITY : 5 Nos.

GROSS WT. : 9 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division,

Bangalore, India. (include BHEL logo

in the

beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS****PS- 439 - 035**

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
10 WATTS PV MODULE PACKING (5 IN 1)****Purpose :**

This item is used for packing of 10 watts PV modules (5 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15 mm thickness.**Density** : 27 - 35 Kg / M³**Dimensional tolerance** : ± 3 mm.**Thickness tolerance** : ± 10 %.**Quantity per Set** :**Corner fitments (L shape)** : 4 nos. / set**Joining of EP foam fitments** : By hot air welding method.**Shape & Dimensions** : As per page 2 of 2.

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DATE

16.8.2004



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 438 - 689

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
10 WATTS PV MODULE PACKING (10 IN 1)**

Purpose :

This item is used for packing of 10 watts PV modules (10 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.
Density : 22 – 24 bf

Inner Dimensions : 515 (L) * 410 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 205 mm size on 410 mm width side on top and bottom.
Two flaps of 205 mm size on 515 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1210
QUANTITY : 10 Nos.
GROSS WT. : 17 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

This is required on one of the length side.

Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.
2. Sample to be supplied and got approved by BHEL before bulk supply.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 438 - 688

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
10 WATTS PV MODULE PACKING (10 IN 1)**

Purpose :

This item is used for packing of 10 watts PV modules (10 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15 mm thickness.

Density : 27 - 35 Kg / M³

Dimensional tolerance : ± 3 mm.

Thickness tolerance : ± 10 %.

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per page 2 of 2.

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22.4.2002



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 047

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
18 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 18 watts PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 700 (L) * 220 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 110 mm size on 220 mm width side on top and bottom.

Two flaps of 110 mm size on 700 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
} **Width sides.**

Upward Arrow , Wine Glass, Umbrella Symbol }

SOLAR PV MODULE : L1218

QUANTITY : 5 Nos.

GROSS WT. : 13 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL

logo in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS****PS- 439 - 036**

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
18 WATTS PV MODULE PACKING (5 IN 1)****Purpose :**

This item is used for packing of 18 watts PV modules (5 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15 mm thickness.**Density** : 27 - 35 Kg / M³**Dimensional tolerance** : ± 3 mm.**Thickness tolerance** : ± 10 %.**Quantity per Set** :**Corner fitments (L shape)** : 4 nos. / set**Joining of EP foam fitments** : By hot air welding method.**Shape & Dimensions** : As per page 2 of 2.

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DATE

16.8.2004



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 045

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
18 WATTS PV MODULE PACKING (10 IN 1)**

Purpose :

This item is used for packing of 18 watts PV modules (10 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 700 (L) * 410 (W) * 330 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two flaps of 205 mm size on 410 mm width side on top and bottom.

Two flaps of 205 mm size on 700 mm length side on top and bottom.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
} **Width sides.**

Upward Arrow , Wine Glass, Umbrella Symbol }

SOLAR PV MODULE : L1218

QUANTITY : 10 Nos.

GROSS WT. : 25 Kg.

CARTON NO. :

MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division,
Bangalore, India. (include BHEL logo

in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 034

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
18 WATTS PV MODULE PACKING (10 IN 1)**

Purpose :

This item is used for packing of 18 watts PV modules (10 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15 mm thickness.

Density : 27 - 35 Kg / M³

Dimensional tolerance : ± 3 mm.

Thickness tolerance : ± 10 %.

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per page 2 of 2.

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16.8.2004



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 043

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
35 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 35 watts PV modules (2 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 725 (L) * 140 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 140 mm width on top and bottom
725 mm One half flap of 725 mm width and one full flap of 725 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1235
QUANTITY : 2 Nos.
GROSS WT. : 10 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

This is required on one of the length side.

Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS****PS- 439 - 033**

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
35 / 50 WATTS PV MODULE PACKING (2 IN 1)****Purpose :**

This item is used for packing of 35 / 50 watts PV modules (2 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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Engg.

16.8.04



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 041

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
35 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 35 watts PV modules (4 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 725 (L) * 250 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 250 mm width on top and bottom
725 mm One half flap of 725 mm width and one full flap of 725 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1235
QUANTITY : 4 Nos.
GROSS WT. : 19 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

This is required on one of the length side.

Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 032

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
35 / 50 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 35 / 50 watts PV modules (4 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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Engg.

16.8.04



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 039

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
35 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 35 watts PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 725 (L) * 305 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 305 mm width on top and bottom
725 mm One half flap of 725 mm width and one full flap of 725 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1235
QUANTITY : 5 Nos.
GROSS WT. : 24 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

This is required on one of the length side.

Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 031

REV.00

A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
35 / 50 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 35 / 50 watts PV modules (5 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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16.8.04



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 044

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
50 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 50 watts PV modules (2 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 920 (L) * 140 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 140 mm width on top and bottom
920 mm One half flap of 920 mm width and one full flap of 920 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1250
QUANTITY : 2 Nos.
GROSS WT. : 12 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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Note : 1. Supplier Certification required for 250 GSM paper and 22-24 bf.

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 042

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A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
50 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 50 watts PV modules (4 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 920 (L) * 250 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 250 mm width on top and bottom
920 mm One half flap of 920 mm width and one full flap of 920 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1250
QUANTITY : 4 Nos.
GROSS WT. : 24 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 040

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A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
50 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 50 watts PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 920 (L) * 305 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 305 mm width on top and bottom
920 mm One half flap of 920 mm width and one full flap of 920 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1250
QUANTITY : 5 Nos.
GROSS WT. : 30 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 048

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A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
70 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (2 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1250 (L) * 140 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 140 mm width on top and bottom.
1250 mm One half flap of 1250 mm width and one full flap of 1250 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1270
QUANTITY : 2 Nos.
GROSS WT. : 17 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 037

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A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
70 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (2 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 058

REV.00

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
70 WATTS PV MODULE PACKING (3 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (3 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1250 (L) * 195 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 195 mm width on top and bottom.
1250 mm One half flap of 1250 mm width and one full flap of width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1270
QUANTITY : 3 Nos.
GROSS WT. : 25 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

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PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
70 WATTS PV MODULE PACKING (3 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (3 in 1 configuration).

Material : Profeel / Armour Expanded Polyethylene (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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27.10.04



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 014

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
70 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (4 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1250 (L) * 250 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 250 mm width on top and bottom
1250 mm One half flap of 1250 mm width and one full flap of width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1270
QUANTITY : 4 Nos.
GROSS WT. : 33 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 013

REV.00

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
70 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (4 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15
and 20 mm
thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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10.6.03



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 438 - 682

REV.02

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
70 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (5 in 1 configuration).

Material : 5 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1250 (L) * 305 (W) * 590 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 305 mm width on top and bottom
1250 mm One half flap of 1250 mm width and one full flap of 1250 mm width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L1270
QUANTITY : 5 Nos.
GROSS WT. : 41 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
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Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 438 - 681

REV.01

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
70 WATTS PV MODULE PACKING (5 IN 1)**

Purpose :

This item is used for packing of 70 watts PV modules (5 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P.) Foam of 15
and 20 mm
thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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30.8.02



**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 049

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
100 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 100 watts PV modules (2 in 1 configuration).

Material : 7 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1190 (L) * 160 (W) * 850 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 160 mm width on top and bottom.
1190 mm One half flap of 1190 mm width and one full flap of width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L24100
QUANTITY : 2 Nos.
GROSS WT. : 23 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 038

REV.00

A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
100 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 100 watts PV modules (2 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 025

REV.00

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
100 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 100 watts PV modules (4 in 1 configuration).

Material : 7 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1190 (L) * 290 (W) * 850 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 290 mm width on top and bottom.
1190 mm One half flap of 1190 mm width and one full flap of width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L24100
QUANTITY : 4 Nos.
GROSS WT. : 45 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 026

REV.00

A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
100 WATTS PV MODULE PACKING (4 IN 1)**

Purpose :

This item is used for packing of 100 watts PV modules (4 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15
and 20 mm
thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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A4-10

**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 029

REV.00

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
120 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 120 watts PV modules (2 in 1 configuration).

Material : 7 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1360 (L) * 160 (W) * 850 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 160 mm width on top and bottom.
1360 mm One half flap of 1360 mm width and one full flap of width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L24120
QUANTITY : 2 Nos.
GROSS WT. : 30 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 030

REV.00

A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
120 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 120 watts PV modules (2 in 1 configuration).

Material : Profeel / Armour Expanded Polyethylene (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 027

REV.00

A4-10

PAGE 01 OF 01

**CORRUGATED CARTON BOX FOR
150 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 150 watts PV modules (2 in 1 configuration).

Material : 7 ply 250 GSM Craft paper.

Density : 22 – 24 bf

Inner Dimensions : 1640 (L) * 160 (W) * 850 mm (H) (Tolerance ± 5 mm).

Adequate stapling should be done for forming the carton box.

Flaps : Two small size flaps of 160 mm width on top and bottom.
1640 mm One half flap of 1640 mm width and one full flap of width on top and bottom on the L * W side.

Printing : (Blue Colour)

“ GLASS - HANDLE WITH CARE “ } **Required on both**
Upward Arrow , Wine Glass, Umbrella Symbol } **Width sides.**

SOLAR PV MODULE : L24150
QUANTITY : 2 Nos.
GROSS WT. : 35 Kg.
CARTON NO. :
MODULE SL. NOS. :

Manufactured by : Bharat Heavy Electricals Ltd,
Electronics Division, Bangalore, India. (include BHEL logo
in the beginning)

Website : <http://bhel.com/products/photovoltaics/photovoltaics.htm>

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**PURCHASE SPECIFICATION
GROUP : PHOTOVOLTAICS**

PS- 439 - 028

REV.00

A4-10

PAGE 01 OF 02

**EXPANDED POLYETHYLENE FOAM FITMENTS FOR
150 WATTS PV MODULE PACKING (2 IN 1)**

Purpose :

This item is used for packing of 150 watts PV modules (2 in 1 configuration).

Material : Profeel / Armour Expanded Polyethlyne (E.P) Foam of 15 and 20 mm thickness.

Density : 27 - 35 Kg / M³

Quantity per Set :

Corner fitments (L shape) : 4 nos. / set

E type fitment : 2 nos. / set

Joining of EP foam fitments : By hot air welding method.

Shape & Dimensions : As per drawing in page 2 of 2.

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