

PROJECT: TWBS-2X660MWMAITREE STPP,BANGLADESH**PR NO: 1900167508****ITEM: STRAINERS**

S.NO	Material code	Description	QTY	PRICE WEIGHTAGE FACTOR	BIDDERS CONFIRMATION
1	PY9752056156	Y-STRAINER 6" #150 FL FF A216WCB	1	0.4412	
2	PY9752163025	Y-STRAINER 2.5" #150 FL RF SS	1	0.5588	

NOTES:

- 1 Vendor to Quote Lumpsum Price for the Total Package.
- 2 Line Item Rates of the individual items shall be derived by multiplying the "Price Weightage Factor" with the Lumpsum Price quoted.
- 3 Unit Rates of the Individual items shall be further derived by dividing the Line item rates with the Quantities.
- 4 Unit Rates of the Individual items thus arrived, shall be binding on the bidder, in case of any repeat order as per BHEL policies.
- 5 Observations / Objections, if any, of the Bidder, to the "Price Weightage Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage.
- 6 No Observations / Objections shall be entered after the Techno-Commercial Bid is opened.
- 7 Bidder to indicate "Quoted" in the column "Bidder's Confirmation" as a confirmation of their bid to the respective item.
- 8 The Bid Evaluation is on Overall L1 Basis. Each and Every item of the Package shall be quoted by the bidder.
- 9 Partial offers will not be considered for evaluation and the same are liable for rejection.
- 10 The Total Lump price quoted shall be INCLUSIVE of Freight, Packing & Forwarding and Testing Charges& GST charges.
- 11 The Total Lump price quoted shall be EXCLUSIVE of Third party inspection (TPI) & Insurance Charges.

2x660MW MAITREE STPP, BANGLADESH **Pre-Qualification Criteria (Technical)**

Package Name : **STRAINERS**
PR No : **1900167508**

Manufacturers of **STRAINERS** qualified as per the Pre-qualification criteria laid down below, are allowed to bid. Documentary evidence shall be provided by such bidders to establish their claim. **However, offer consideration is subjected to approval from end Customer.**

The bid evaluation shall be on Overall L1 basis. The Bidder shall meet the Pre-Qualification Criteria (listed below.

Non-compliance to any of the criteria listed below will lead to disqualification of bidder for the subject item of the tender.

Qualification Criteria of the Bidder:

1. The bidder should be an established manufacturer of **Strainers** and should have successfully completed Manufacture, Supply of **Strainers**.
2. The Bidder should have successfully completed supply of **Y type Strainers** for similar specification with a total minimum quantity of **2 No's** (Sizes in the range of 65 NB and above) through a single Purchase Order or multiple Purchase Orders in the last 5 years ending on original due date of this tender, with at least one order executed after 01.01.2023.
3. Detailed BOQ of the items supplied, satisfying the criteria laid down above, shall be provided in the format enclosed as Annexure-1, with details like Project & Customer, Description & Quantity of Items supplied, PO details etc. as a minimum for assessing pre-qualification. **PO Copies, Inspection Reports and Dispatch documents shall be enclosed for the references provided.**
4. The bidder should not have been under suspension for business or blacklisted by any of the BHEL units.

Annexure-1 PQC Criteria**Supply References for the Last 5 Years (dispatch date) from the Original due date of this tender****Enquiry Item No & Description: (To be filled by Bidder)**

Sl No	Project Name along with name of Customer	Description Item(s) supplied	Purchase Order No & Date (Copy to be enclosed)	Delivery Date as per Order	Value of Order	Inspection Reports / Dispatch Documents (Copy to be enclosed)	Remarks

Form No:	 50 Years Maharashtra Company	BHARAT HEAVY ELECTRICALS LIMITED	PY 52056
		PROJECT ENGINEERING & SYSTEMS DIVISION	Rev. No. 04
		TECHNICAL SPECIFICATION FOR	Page 1 of 6
		Y- TYPE STRAINERS	

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TECHNICAL SPECIFICATION FOR STRAINER Y TYPE, CARBON STEEL.

1.0 GENERAL

The standard specifies the requirements of 'Y' type steam strainer, carbon steel body material, Forged Body (#800 SW End connections), Cast Body (#150, #300, #1500 Flanged Connections) for various sizes as mentioned in variant table.

2.0 APPLICATION

These strainers are used in steam and oil pipe lines, compressed air system, hot water service where the fluid being carried will not attack or to be contaminated by the material of construction.

3.0 TECHNICAL REQUIREMENTS:

CL NO:	Requirements	Compliance
3.1	Pressure temperature rating	ANSI B 16.34, API 602 (for #800)
3.2	Material	As specified in the TABLE –1 and variant table
3.3	Construction	Y- type
3.4	End Connections	Shall be either Socket Welded : 3000# / 6000# as per ANSI B 16.11 Or Flanged : ANSI B 16.5 (150# / 300# / 1500# as mentioned in Variant Table
3.5	Face to Face /End to end dimensions.	(To be furnished by Vendor)
3.6	Wire mesh (Screen)	a) 40 Mesh size b) Wire dia to be selected by vendor Unless otherwise specified in project specific PEMC-XXXX document
3.7	Perforated sheet (Back up screen)	Sheet thickness, Hole dia & Pitch to be selected by vendor to meet the free flow area requirement
3.8	Free flow area	Four (4) times suction pipe flow area Unless otherwise specified in project specific PEMC-XXXX document
3.9	Screen retainer	Required. Bolted screen retainer with off centered blow down
3.10	1. Pressure drop @ 50% clogged condition 2. Flow: Rated flow and maximum flow at the end of the curve	To be furnished by Vendor, Unless otherwise specified in project specific PEMC-XXXX document Vendor to furnish pressure drop, open area and free flow area calculations

Form No:	LAYOUT & PIPING ENGINEERING PROJECT ENGINEERING & SYSTEMS DIVISION	PREPARED	CHECKED	APPROVED	DATE
		RAGHAVENDRA SVN	SRIKANTH G	SUNDAR VVSS	15.11.14

Form No:	 BHEL Maharashtra Company PE&SD	BHARAT HEAVY ELECTRICALS LIMITED	PY 52056	
		PROJECT ENGINEERING & SYSTEMS DIVISION	Rev. No. 04	
PURCHASE SPECIFICATION FOR		Y-STRAINER		
		Page 2 of 6		

TABLE -1

SLNO	PART	MATERIAL (Forged Body)	MATERIAL (Cast Body)
1.	BODY	ASTM A 105	ASTM A 216 WCB
2.	SCREEN & INTERNALS	SS 304	SS 304
3.	GASKET	GRAPHITEFILLER	GRAPHITEFILLER
4.	COVER	ASTM A 105	ASTM A 105
5.	BOLTS & NUTS	ASTM A 193 Gr.B-7 ASTM A 194 Gr 2-H	ASTM A 193 Gr.B-7 ASTM A 194 Gr 2-H
6.	DRAIN PLUG	ASTM A 105	ASTM A 105

Note:

1. Cu & Cu Alloys shall not be used for any component
2. **Commissioning Spares:** One Set of Gaskets and Filter Element (Screen) to be supplied along with the main supply of strainer
3. Any requirements indicated in PEMC-XXXX document (attached along with inquiry) shall supersede the requirements indicated in above TABLE-1

4.0 TEST & TEST CERTIFICATES:

4.1 Body test: The strainer shall be subjected to a hydraulic pressure of

- 207kg/cm² (3000 PSIG) for #800 SW Body,
- 30Kg/cm² (425 PSIG) for #150 FL Body,
- 76Kg/cm² (110 PSIG) for #300 FL Body,
- 373Kg/cm² (5400 PSIG) for #1500 FL Body with all the ends blanked.

No leakage is permitted. The hydro test pressure shall be 1.5 times the design pressure.

Design pressure – maximum allowable pressure at room temperature as per respective codes (B16.34 for #150,#300,#1500 for flanged and API602 for #800 socket welded ends).

4.2 Unless otherwise specified in project specific PEMC-XXXX document,(Provided along with inquiry), IBR certification for strainer is not required.

4.3 For all other testing requirements like radiography, NDT and other testing requirements refer project specific PEMC-XXXX document,(Provided along with inquiry)

4.4 Test certificates: 5 copies of the following test certificates shall be furnished to BHEL along with each consignment in the IBR Form IIIC attested by authorized inspector:

- 4.3.1 Hydraulic test certificates of body for 100% of ordered Qty.
- 4.3.2 Chemical and mechanical test certificate for components of the strainer body, screen and Cover for each heat/melt.
- 4.3.3 **Type test certificate for the flow vs pressure drop for each variety of the Strainers for the flow specified. These type test certificates and the Flow vs Pressure drop curves of the strainers submitted by the vendor should have been certified by Govt. approved labs like CWPRS, Pune.**

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Form No:	 BHEL Maharashtra Company PE&SD	BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING & SYSTEMS DIVISION PURCHASE SPECIFICATION FOR Y-STRAINER	PY 52056
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5.0 INSPECTION AGENCY:

The inspection agency for indigenous strainers shall be authorized inspector of CIB (Chief Inspector of Boilers) and M/s.Lloyds/TUV or any other inspection agency approved by IBR for imported valves.

6.0 GUARANTEE CERTIFICATES:

A guarantee certificate for trouble free operating for a period of 12 months from the date of commissioning or 24 months from the date of dispatch shall be submitted.

7.0 DOCUMENTS:

4 copies each of the following documents shall be submitted along with quotations:

- i) Drawings/leaflets/catalogues for the offered item indicating direction of flow, binding dimensions, bill of materials with material specification details, hydraulic test pressure, weight etc.
- ii) Pressure drop, flow area & open area Calculations as indicated above in point 3.10.
- iii) Quality plan adopted by the supplier during manufacture and inspection/testing.
- iv) Any deviation to this standard proposed by the supplier.

After award of contract:

1. All documentations required as applicable and indicated above shall be submitted within 7 days of PO placement.
2. BHEL will furnish their approvals / comments within 15 days after submission of drawings/ documents.

8.0 CLEANING:

Particular care shall be taken to ensure that all foundry sand and loose materials is properly removed by fettling/shot blasting/sand blasting and thoroughly cleaned.

9.0 SURFACE PREPARATION & PAINTING:

Painting shall as per project specific painting specification (PEMC-XXXX) provided along with inquiry.

In case of non-availability of the same, the painting shall be as per manufacturer standard and Strainers shall be painted externally with blue colour enamel after the hydraulic testing has been carried out.

10.0 MARKING:

The body of Strainer shall have the following markings:

- a) Nominal size
- b) Pressure rating
- c) Body & Screen material
- d) Suppliers trade mark
- e) Arrow showing direction of flow
- f) Inspector's identification mark.

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Y-STRAINER

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11.0 PRESERVATION

A suitable temporary rust preventive with minimum life of 1 year shall be applied inside the body in order to prevent corrosion.

12.0 END PROTECTION:

Strainer ends shall be protected from external damage and sealed against the ingress of dirt by means of plastic/steel end covers firmly secured.

13.0 PACKING:

The strainers shall be packed separately in wooden cases in order to avoid damage during transit and storage at BHEL. Suitable supporters shall be provided inside the case in order to avoid internal movement. In case of imported consignment the packing shall be seaworthy.

Each packing case must contain 2 copies of the shipping list giving details of all the contents of the cases.

14.0 MARKING:

14.1 The following marking shall be done on each packing case.

- a) Complete address of the consignee and destination as per BHEL purchase order.
- b) BHEL purchase order No.
- c) BHEL StandardeNo.: PY52056
- d) Number of pieces in each packing case
- e) Net weight
- f) Gross weight
- g) Packing case number and total number of packings
- h) Arrow indicating top of packing case.

15.0 PROJECT SPECIFIC PEMC-XXXX DOCUMENT:

Any requirements indicated in PEMC-XXXX document (attached along with inquiry) shall supersede the requirements indicated in this specification. In case of ambiguity, the more stringent conditions/requirements prevail.

Form No:	 50 Years Maharashtra Company PE&SD	BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING & SYSTEMS DIVISION PURCHASE SPECIFICATION FOR Y-STRAINER	
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VARIANT TABLE

SL NO	VAR	ITEM DESCRIPTION	MATL CODE
01	01	Y-STRAINER 1" #800 SW A105	PY9752056016
02	02	Y-STRAINER 2" #800 SW A105	PY9752056024
03	03	Y-STRAINER 3" #150 FL RF A216WCB	PY9752056032
04	04	Y-STRAINER 4" #150 FL RF A216WCB	PY9752056040
05	05	Y-STRAINER 6" #150 FL RF A216WCB	PY9752056059
06	06	Y-STRAINER 3" #300 FL RF A216WCB	PY9752056067
07	07	Y-STRAINER 4" #300 FL RF A216WCB	PY9752056075
08	08	Y-STRAINER 6" #300 FL RF A216WCB	PY9752056083
09	09	Y-STRAINER 2" #1500 FL RTJ A216WCB	PY9752056091
10	10	Y-STRAINER 3" #1500 FL RTJ A216WCB	PY9752056105
11	11	Y-STRAINER 4" #1500 FL RTJ A216WCB	PY9752056113
12	12	Y-STRAINER 14" #150 FL RF A216WCB	PY9752056121
13	13	Y-STRAINER 3" #150 FL FF A216WCB	PY9752056130
14	14	Y-STRAINER 4" #150 FL FF A216WCB	PY9752056148
15	15	Y-STRAINER 6" #150 FL FF A216WCB	PY9752056156
16	16	Y-STRAINER 1.5" 800# SW A105	PY9752056164

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Form No:	BHEL Maharashtra Company Golden Jubilee 50 Years PE&SD	BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING & SYSTEMS DIVISION		PY 52163
		TECHNICAL SPECIFICATION FOR		Rev. No. 01
		Y- TYPE STRAINERS (SS)		Page 1 of 4

COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.	TECHNICAL SPECIFICATION FOR Y -TYPE STRAINER (SS)			
	1.0 GENERAL	The standard specifies the requirements of 'Y' type steam strainer, Stainless steel body material, SW End connections for #800, flanged End connections for #150, #300, #1500 for various sizes as mentioned in variant table.		
	2.0 Application :	These strainers are used in foam concentrate, DM water application where the fluid being carried will not attack or not to be contaminated by the material of construction.		
	3.0 TECHNICAL REQUIREMENTS			
	SL NO:	Requirements	Compliance	
	3.1	Press./temp Rating	ANSI B 16.34, API 602 (for #800)	
	3.2	Material	As specified in the TABLE –1 and variant table	
	3.3	Construction	Y- type	
	3.4	End Connections	Shall be either Socket Welded : 3000# / 6000# as per ANSI B 16.11 OR Flanged : ANSI B 16.5 (150# / 300# / 1500# as mentioned in Variant Table	
	3.5	Face to Face /End to end dimensions.	(To be furnished by Vendor)	
	3.6	Wire mesh (Screen)	20SWG-SS316;30 mesh Position of Wire mesh & perforated sheet: The position of both wire mesh & perforated sheet shall be such a way that wire mesh should be first to in the flow line so that perforated sheet shall be supported. I.e if the flow is from inward to outward direction, wire mesh shall be inside perforated sheet and if the flow is from outward to inward, wire mesh shall be outside the perforated sheet	
	3.7	Perforated sheet (Back up screen)	Sheet thickness (Minimum of 18 SWG SS316), Hole dia & Pitch to be selected by vendor to meet the free flow area requirement. Structural bar support to be provided for this perforated sheet.	
	3.8	Free flow area	Four (4) times pipe flow area	
	3.9	Screen retainer	Required. Bolted screen retainer with off centered blow down	
	3.10	1. Pressure drop @ 50% clogged condition 2. Flow: Rated flow and maximum flow at the end of the curve	(To be furnished by Vendor) Vendor to furnish pressure drop, open area and free flow area calculations	

Form No:	LAYOUT & PIPING ENGINEERING PROJECT ENGINEERING & SYSTEMS DIVISION	PREPARED	CHECKED	APPROVED	DATE
		G.PARAMESH	V.UDAY	SRIKANTH . G	1.06.18

Form No:	PE&SD	 50 Years Golden Jubilee Maharashtra Company	BHARAT HEAVY ELECTRICALS LIMITED	PY 52163
			PROJECT ENGINEERING & SYSTEMS DIVISION	Rev. No. 01
			PURCHASE SPECIFICATION FOR	
			Y-STRAINER (SS)	Page 2 of 4

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TABLE –1

SLNO	PART	MATERIAL
1.	BODY	ASTM A403 Gr WP304
2.	SCREEN	SS 316
3.	GASKET	GRAPHITEFILLER
4.	COVER	ASTM A182 Gr F304
5.	BOLTS & NUTS	ASTM A 193 Gr.B-7 ASTM A 194 Gr 2-H
6.	DRAIN PLUG	ASTM A182 F316

NOTE: Cu & Cu alloys shall not be used for any component.

4.0 TEST & TEST CERTIFICATES:

4.1 Body test: The strainer shall be subjected to a hydraulic pressure of

- 207kg/cm² (3000 PSIG) for #800 SW Body,
- 30Kg/cm² (425 PSIG) for #150 FL Body,
- 76Kg/cm² (110 PSIG) for #300 FL Body,
- 373Kg/cm² (5400 PSIG) for #1500 FL Body with all the ends blanked.
- No leakage is permitted.
- The hydro test pressure shall be 1.5 times the design pressure
Design pressure – maximum allowable pressure at room temperature as per respective codes (B16.34 for #150,#300,#1500 for flanged and API602 for #800 socket welded ends)

4.2 Test certificates: 5 copies of the following test certificates shall be furnished to BHEL along with each consignment.

4.2.1 Hydraulic test certificates of body for 100% of ordered Qty.

4.2.2 Chemical and mechanical test certificate for components of the strainer body, screen and Cover for each heat/melt

4.2.3 Type test certificate for the flow vs pressure drop for each variety of the Strainers for the flow specified. These type test certificates and the Flow vs Pressure drop curves of the strainers submitted by the vendor should have been certified by Govt. approved labs like CWPRS, Pune.

5.0 INSPECTION AGENCY:

The inspection agency for indigenous strainers shall be authorized inspector of inspection agency approved by BHEL or inspection by BHEL Quality official.

6.0 GUARANTEE CERTIFICATES:

A guarantee certificate for trouble free operating for a period of 12 months from the date of Commissioning or 24 months from the date of dispatch shall be submitted.

7.0 DOCUMENTS:

7.1 4 copies each of the following documents shall be submitted along with quotations.

- i) Drawings/leaflets/catalogues for the offered item indicating direction of flow, binding dimensions, bill of materials with material specification details, hydraulic test pressure, weight Pressure drop, flow area & open area Calculations as indicated above in point 3.10.
- ii) Quality plan adopted by the supplier during manufacture and inspection/testing.
- iii) Any deviation to this standard proposed by the supplier.

Form No:	PE&SD	 50 Years Golden Jubilee Maharashtra Company	BHARAT HEAVY ELECTRICALS LIMITED	PY 52163
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			PURCHASE SPECIFICATION FOR	
			Y-STRAINER (SS)	Page 3 of 4

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	8.0 CLEANING:
	Particular care shall be taken to ensure that all foundry sand and loose materials is properly removed by fettling/shot blasting / sand blasting and thoroughly cleaned.
	9.0 PAINTING:
	Painting shall as per project specific painting specification provided along with inquiry. In case of non-availability of the same, Strainers shall be painted externally with blue colour enamel after the hydraulic testing has been carried out.
	10.0 MARKING:
	10.1 Body: The body of the valve shall have the following markings: a) Nominal size b) Pressure rating c) Body & Screen material d) Suppliers trade mark e) Arrow showing direction of flow f) Inspector's identification mark.
	11.0 PRESERVATION:
	A suitable temporary rust preventive with minimum life of 1 year shall be applied inside the body in order to prevent corrosion.
	12.0 END PROTECTION:
	Strainer ends shall be protected from external damage and sealed against the ingress of dirt by Means of plastic/steel end covers firmly secured.
	13.0 PACKING:
	13.1 The strainers shall be packed separately in wooden cases in order to avoid damage during Transit and storage at BHEL. Suitable supporters shall be provided inside the case in order to Avoid internal movement. In case of imported consignment the packing shall be seaworthy. 13.2 Each packing case must contain 2 copies of the shipping list giving details of all the contents of the case.
	14.0 MARKING:
	14.1 The following marking shall be done on each packing case. a) Complete address of the consignee and destination as per BHEL purchase order. b) BHEL purchase order No. c) BHEL Standard No.: PY52163

Form No:	PE&SD	  Golden Jubilee 50 Years Maharashtra Company	BHARAT HEAVY ELECTRICALS LIMITED	PY 52163
			PROJECT ENGINEERING & SYSTEMS DIVISION	Rev. No. 01
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			Y-STRAINER (SS)	

d) Number of pieces in each packing case
 e) Net weight
 f) Gross weight
 g) Packing case number and total number of packings.
 h) Arrow indicating top of packing case.

VARIANT TABLE

SL .NO	VAR	ITEM DESCRIPTION	MATL CODE
01	01	Y-STRAINER 2" #150 FL FF SS	PY9752163017
02	02	Y-STRAINER 2.5" #150 FL FF SS	PY9752163025

RECORD OF REVISIONS

Rev. No.	Date	Revision Details	Revised	Approved
00	01.06.18	First Issue		
01	03.06.20	Type test certificate added	M.A.MOQEET	GS

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BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD-32

DATA SHEET FOR CS Y - STRAINER

1. Service : Fire Water
2. Size : As per Approved Drawing
3. Working Pressure : 12.5 Kg/cm² (g)
4. Design Pressure : 16 Kg/cm²(g)
5. Design Temperature : 55° C
6. Corrosion allowance : 2 mm
7. Filter Rating : 30 Mesh With 34 SWG
8. Screen area ratio : 4:1
9. Max. Permissible Pr. Drop
 - a) Clean condition : As per Approved Drawing
 - b) 50% Clogged Condition : As per Approved Drawing
10. Material of construction
 - a) Body : ASTM A 216 WCB
 - b) Filter medium : SS-316
 - c) Bolts & Nuts : ASTM A 193 Gr.B-7
 - d) Gaskets : ASTM A 194 Gr 2-H
 -
11. End Connection : Flanged to ANSI B16.5, 150#, FF
12. Hydrostatic Test Pressure : 24.0 Kg/cm²(g)



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD-32

DATA SHEET FOR SS Y - STRAINER

1. Service : Foam
2. Size : As per Approved Drawing
3. Working Pressure : 1.0 Kg/cm² (g)
4. Design Pressure : 1.5 Kg/cm²(g)
5. Design Temperature : Ambient
6. Corrosion allowance : 2 mm
7. Filter Rating : 30 Mesh with 34 SWG
8. Screen area ratio : 4:1
9. Max. Permissible Pr. Drop
 - a) Clean condition : 0.25 KG/SQ.CM
 - b) 50% Clogged Condition : 0.5 KG/SQ.CM
10. Material of construction
 - a) Body : A351GR CF8
 - b) Filter medium : SS 316
ASTM A 193 Gr.B-7
 - c) Bolts & Nuts : ASTM A 194 Gr 2-H
 - d) Gaskets : GRAPHITEFILLER
11. End Connection : Flanged to ANSI B16.5, 150#, FF
12. Hydrostatic Test Pressure : 12.0 Kg/cm²(g)

Rev No. B	Form No.	 <p>BHEL HYDERABAD</p>	<p>BHARAT HEAVY ELECTRICALS LIMITED Project Engineering & Systems Division (PE&SD) HYDERABAD – 32</p>	PEMC-07444
				Rev No. 00
				Page 1 of 1

Project: **MAITREE FPS BANGLADESH**

Scope:

This document indicates the **special requirements** to be considered for supply of Strainers **in addition to requirements** indicated in PY Specifications furnished along with the Tender documents.

PROJECT SPECIFIC REQUIREMENT FOR STRAINERS: -

Sl. No	PR Number	Material code	Description	Special Requirements
1)	1900167508/10	PY9752056156	Y-STRAINER 6" #150 FL FF A216WCB	i. Mesh Size Shall be 30 Mesh ii. Flow Vs Pressure drop test certificates to be furnished from CWPRS/Pune. iii. Refer below table for Flow Vs pressure drop details
2)	1900167508/20	PY9752163025	Y-STRAINER 2.5" #150 FL FF SS	

FLOW Vs PRESSURE DROP DETAILS FOR STRAINERS:-

Sl. No	Description	Medium	Flow in LPM	Allowable Pressure Drop in Kg/Sq.cm	
				100% Clean	50% clogged
1)	Y-STRAINER 6" #150 FL FF A216WCB	Fire Water	6833	0.8207	0.8077
2)	Y-STRAINER 2.5" #150 FL FF SS	Fire Water	192	0.25	0.5

ASSEMBLY LENGTH/END TO END LENGTH FOR STRAINERS:-

Sl. No	Description	Medium	ASSEMBLY LENGTH (MM)
1)	Y-STRAINER 6" #150 FL FF A216WCB	Fire Water	485
2)	Y-STRAINER 2.5" #150 FL FF SS	Fire Water	318

Note: Strainers are replacement supply hence, complying with assembly length is mandatory.

Rev. No.	Date	Revision Details	Revised By	Checked By	Approved By
00	10.12.25	First issue	<i>G paramesh</i> (G PARAMESH)	<i>G paramesh</i> (G PARAMESH)	<i>gupta</i> (GS)

Ref Doc		Revisions: Refer to record of revisions	Prepared by: <i>G paramesh</i> (G PARAMESH)	Checked by: <i>G paramesh</i> (G PARAMESH)	Approved by: <i>gupta</i> (GS)	Date: 10.12.25
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**PROJECT ENGINEERING & SYSTEMS DIVISION
RC PURAM, HYDERABAD.
QUALITY & BUSINESS EXCELLENCE**

INSPECTION / TC REVIEW FORMAT

1	Vendor's Name:		5	Applicable BHEL Spec No:	
2	Project:		6	Approved Drawing No:	
3	PO No:		7	Approved Data Sheet No:	
4	Item Description:		8	Approved QAP No:	

OFFER LIST

S.No	BBU/ PO Sr. No.	Item Description	Total Qty as per PO/BBU	Qty. already accepted	Qty offered for TC review	Cumulative Qty	Balance Qty
A							
B							
C							
D							

TC REVIEW REQUISITION

BBU / PO Sr. No.	QAP Clause No.	Format of Record	Certificate No. & Date			Page No.	REMARKS
A. Item Description:							
B. Item Description:							
C. Item Description:							
D. Item Description:							
E. Item Description:							

SUPPLIER / VENDOR SIGNATURE WITH SEAL	BHEL/ BHEL's TPIA SIGNATURE WITH SEAL
Dt:	Dt:

Format No: PESD/QA/10, Rev: 00

TD-201 Rev No. 00	Form No.	 <p>PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD</p>	ANNEXURE Page 1 of 3
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QAP GUIDELINES & FORMAT

(ANNEXURE)

The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement.

Note :

1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval.
2. No deviation to reference document is acceptable.

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Form No.	 <p>बी एच ई एल BHEL HYDERABAD</p>	<p style="text-align: center;">PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD</p>	ANNEXURE Page 2 of 3
<u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u>			
<p>1. QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10.</p> <p>2. Each page of QAP shall contain the following information.</p> <ul style="list-style-type: none"> a) Vendor's name & address. b) Customer: BHEL, Hyderabad. c) Project. d) BHEL Product Standard Number/revision number as referred in P.O. e) BHEL Purchase Order Number & Date. f) Product as per P.O. description. g) QAP Number (unique and shall not repeat)/revision number/date. h) Page number and number of pages <p>3. QAP shall contain four parts / stages as follows.</p> <ul style="list-style-type: none"> a) Raw materials and bought out items. b) In process Control / Inspection. c) Final assembly, Inspection & Testing. d) Painting, preservation & packing. <p>4. Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc).</p> <p>5. Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.)</p> <p>6. Under 'Class', indicate minor, major or critical depending on the importance of characteristic.</p> <p>7. Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.)</p> <p>8. Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.)</p> <p>9. Under 'Reference document' and 'Acceptance norms', appropriate National & International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review & approval by our Engineering dept.</p> <p>10. Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.</p> <p>11. Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 2: (Vendor / Sub vendor) Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where</p>			
Ref. Doc			

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Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Page 3 of 3
<p>COPYRIGHT AND CONFIDENTIAL</p> <p>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.</p>			
<p>witness points are indicated in specification, P.O., Drawing etc., for such operations, under Witness (W) column use 1. Under 'Verify' column, use code1.</p> <p>12. Under 'D' please put (✓ Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification.</p> <p>13. Vendor's signature & stamp should be available on each page of QAP.</p> <p>14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings.</p> <p>15. The following operations/characteristics/check points may be included (AS APPROPRIATE)</p> <ul style="list-style-type: none"> a) Visual check b) Dimensional check c) Mechanical and Chemical properties. d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. f) Check for correctness for all components mounted as per General arrangement Drawing, Bill Of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc. g) Verification of test certificate for protection class for the enclosures. h) Mechanical functioning of switches. i) Continuity of earthing and provision of earth points. j) Colour coding of wiring, size, tightness & dressing of wiring. k) Review of test certificates of assembled items, raw materials, internal test reports etc. l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non Destructive Tests. p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating) q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. r) Packing and Preservation. <p>16. QAP Format enclosed.</p> <p>17. Typical Manufacturing QAP is attached.</p> <p>18. Packing shall be witnessed by BHEL/BHEL's TPIA.</p> <p>19. NTPC RQP shall be followed in case of NTPC project along with BHEL tender requirement.</p>			
Ref. Doc			10

VENDOR TO NOTE: THIS FORMAT IS IN MICROSOFT WORD. HEADER & FOOTER SHALL BE AVAILABLE IN EACH PAGE OF QP. QP SHALL BE IN LANDSCAPE & A4 SIZE ONLY. FONT SIZE SHALL BE MIN 10. VENDOR SHALL SIGN & STAMP IN EACH PAGE OF QP. LOI REF. & DATE ARE NOT ACCEPTABLE. P.O.NO. & DATE SHALL BE INDICATED. QP NO. SHOULD BE UNIQUE AND SHALL NOT REPEAT. ALL THE TESTS / CHECKS INDICATED IN THE BHEL SPEC. SHALL BE INDICATED IN THE QP.

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.

VENDOR'S NAME & ADDRESS:		TYPICAL MANUFACTURING QUALITY PLAN							QP. NO.:			
		CUSTOMER: BHEL, HYDERABAD – 32.			BHEL P.O.NO.: P.O.DATE: BHEL SPEC:			REV:	REV NO:	DATE:		
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY		REMARKS
									P	W	V	

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.

PREPARED BY
VENDOR'S SIGNATURE & STAMP

APPROVED BY
BHEL QA SIGNATURE & STAMP

APPROVED BY
CUSTOMER'S SIGNATURE & STAMP

Date: 05-Sep-2021

*Approval doesn't absolve the EPC contractor of its responsibility as specified in the Contract.

00	04-Sep-2020	NIRAJ	NIRAJ	NIRAJ	FIRST SUBMISSION	
	DATE	ALTERED	CHECKED	APPROVED	NOTE	
PROJECT 2x660MW MAITREE SUPER THERMAL POWER PROJECT, RAMPAL, BANGLADESH (EPC MAIN PLANT PACKAGE)						
OWNER CONSULTANT:  M/s FICHTNER GmbH & Co KG, Stuttgart, GERMANY				OWNER: BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (PVT.) LIMITED, BANGLADESH		
DRAWN BY	DATE	NAME		BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION, HYDERABAD		SCALE: NA
DESIGN BY				TITLE : QAP FOR Y STRAINER INSPECTION CATEGORY - I		
CHECKED BY						
APPROVED BY						
SUPERSEDES:			SIZE : A4	PROJECT NO.:	FILE :	
SUPERSEDED BY:			ANNEX:	DRAWING NO.: MAITREE-00-SG-QA-384045-PES		CAT-I
SYSTEM: FIRE PROTECTION AND DETECTION SYSTEM						REV. 00
SIZE-A0						

DRAWING No.: MAITREE-00-SG-QA-384045-PES
DATASHEET No.: MAITREE-00-SGC-DA-376170-PES

INSPECTION CATEGORY - I

Factory : Survey No 47/4, Shed No 342, Kudus, Kondla Road ,
Beside Actual Industrial Estate, Village- Vadavli, Tal-Wada, Dist-
Palghar, Pin-421 312, Maharashtra

OTOKLIN
GLOBAL BUSINESS LIMITED

MANUFACTURING QUALITY PLAN

ITEM : QAP FOR Y STRAINER
QP NO.: OC 1081
REV. NO.: 00
DATE: 03.09.2021
SUB-SYSTEM: FPDS SYSTEM

PROJECT: MAITREE PROJECT

PACKAGE: Y TYPE STRAINERS

CONTRACT NO.:

MAIN-SUPPLIER: BHEL HYDERABAD
SUB SUPPLIER: OTOKLIN GLOBAL BUSINESS LTD

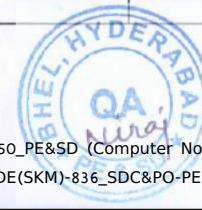
SL. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				M	C	N	
1	2	3	4	5	6		7	8	9	D*	** 10		11

1.0 RAW MATERIAL INSPECTION

1.1	MS PLATE / ERW PIPE FOR BODY (IF FABRICATED)	CHEMICAL AND MECHANICAL PROPERTIES	MAJOR	CHEMICAL AND MECHANICAL PROPERTIES	1 SAMPLE PER HEAT	RELEVANT MATERIAL STANDARD AS PER APPROVED DRAWING / DATASHEET		TC		P	V	V	REFER NOTE-1
		VISUAL		VISUAL	100%	FREE FROM SURFACE DEFECTS		IR		P			
1.2	CAST BODY	CHEMICAL AND MECHANICAL PROPERTIES	MAJOR	CHEMICAL AND MECHANICAL PROPERTIES	1 SAMPLE PER HEAT	RELEVANT MATERIAL STANDARD AS PER APPROVED DRAWING / DATASHEET		TC		P	V	V	REFER NOTE-1
		SOUNDNESS OF CASTING		HYDROTEST	100%	SEE NOTE-3	NO LEAKAGE	IR		P	V	V	
1.3	WIRE MESH (SCREEN)	CHEMICAL	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE PER HEAT	AAPD. DRAWING/ DATA SHEET	AAPD. DRAWING/ DATA SHEET	TC		P	V	V	
		MESH SIZE		DIMENSIONAL	1 SAMPLE PER LOT	AAPD. DRAWING/ DATA SHEET	AAPD. DRAWING/ DATA SHEET	IR		P	V	V	
		VISUAL	MAJOR	VISUAL	100%	FREE FROM SURFACE DEFECTS		IR		P	V	V	

2.0 IN PROCESS INSPECTION

2.1	WELDING (IF APPLICABLE)	WELDING PROCEDURE QUALIFICATION WELDER QUALIFICATION	MAJOR	VISUAL, MECHANICAL TESTS, NDT	100% & EACH WELDER	ASME Sec IX. Approved WPS, PQR	ASME Sec IX.	QW-482, 483, 484 of ASME Sec IX		P	V	V	REFER NOTE-4
		EDGE PREPARATION & FITUP CHECK		VISUAL & DIMENSIONAL	100%, --	APPROVED WPS / FABRICATION DRAWING		IR		P	V		
2.2	WELD QUALITY (IF APPLICABLE)	SOUNDNESS OF FINAL RUN OF BUTT WELDS & FILLET WELDS INCLUDING NOZZLE WELDS	MAJOR	DP TEST	100%, RANDOM 10% OF EACH WELD	ASTM E-165	NO RELEVANT INDICATION	IR		P	W	V	REFER NOTE- 2 & 5
		COMPLETENESS AND SURFACE FINISH		VISUAL AND DIMENSIONAL	100%	AAPD. DRAWING/ DATA SHEET	AAPD. DRAWING/ DATA SHEET	IR		P	V	V	
2.3	MACHINING OF SURFACES, DRILLING OF HOLES ETC	ON MACHINED SURFACE (EXCEPT RAISED FACE)	MAJOR	VISUAL	10% OF EACH SIZE	ASME SEC-V		IR		P	V	V	
2.4	DPT	ON MACHINED SURFACE (EXCEPT RAISED FACE)	MAJOR	VISUAL	10% OF EACH SIZE	ASME SEC-V		IR		P	V	V	



DRAWING No.: MAITREE-00-SG-QA-384045-PES
DATASHEET No.: MAITREE-00-SGC-DA-376170-PES

INSPECTION CATEGORY - I

OTOKLIN GLOBAL BUSINESS LIMITED Factory : Survey No 47/4, Shed No 342, Kudus, Kondla Road, Beside Actual Industrial Estate, Village- Vadavli, Tal-Wada, Dist- Palghar, Pin-421 312, Maharashtra		MANUFACTURING QUALITY PLAN				PROJECT: MAITREE PROJECT								
		ITEM : QAP FOR Y STRAINER		QP NO.: OC 1081		PACKAGE : Y TYPE STRAINERS								
		SUB-SYSTEM: FPDS SYSTEM		REV. NO.: 00 DATE: 03.09.2021		CONTRACT NO.:								
						MAIN-SUPPLIER: BHEL HYDERABAD								
						SUB SUPPLIER: OTOKLIN GLOBAL BUSINESS LTD								
SL. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS	
					M	C/N				M	C	N		
1	2	3	4	5	6	7	8	9	D*	** 10		11		
3.0 FINAL INSPECTION														
3.1	STRAINER ASSEMBLY	VISUAL AND DIMENSIONAL	MAJOR	VISUAL & DIMENSIONS	10% OF EACH TYPE	AAPD. DRAWING/ DATA SHEET	AAPD. DRAWING/ DATA SHEET	IR		P	W	W		
		HYDROTEST	MAJOR	HYDROTEST	10% OF EACH TYPE	AAPD. DRAWING/ DATA SHEET	NO LEAKAGE	IR		P	W	W		
		FLOW VS PRESSURE DROP TEST	CRITICAL	MEASURE (TYPE TEST)	ONE PER TYPE AND SIZE	AAPROVED TEST PROCEDURE	AAPD. DRAWING/ DATA SHEET	IR		P	W	W	# Flow v/s Pressure Drop Test Report shall be reviewed by Supplier & NTPC for each type and size, if carried out by reputed institute like CWPRS / IIT.	
4.0	REVIEW OF QAP DOCUMENTS	COMPLETENESS OF DOCUMENTS AND RECORDS	MAJOR	VERIFICATION	100%	AAPD. DRAWING/ DATA SHEET	AAPD. DRAWING/ DATA SHEET	IR		P	V	V		
4.1	MARKING AND PACKING	COMPLETENESS	MAJOR	VERIFICATION	100%	AAPD. DRAWING/ DATA SHEET	AAPD. DRAWING/ DATA SHEET			P	W			
NOTES: 1) IN ABSENCE OF CO-RELATED TCS, CHECK TEST SHALL BE CARRIED OUT BY MANUFACTURER NABL APPROVED LAB. 2) NO WELD REPAIR ON CI CASTING IS PERMITTED. 3) HYDROTEST PRESSURE SHALL BE 2 TIMES OF WORKING PRESSURE OR 1.5 TIMES OF DESIGN PRESSURE WHICHEVER IS HIGHER FOR 30 MINUTES. 4) WPS / PQR APPROVED BY NTPC /BHEL/LLOYDS/BVQI/DNV/TUV ARE ACCEPTABLE. WELDER QUALIFIED BY THESE AGENCIES SHALL BE DEPLOYED. 5) SL. NO 2.1, 2.2 APPLICABLE IN CASE OF WELD CONSTRUCTION ONLY.														
				LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (V) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'.		N:		DOC. NO.: 9571-151-QVM-Q-012						REV.:00
MANUFACTURER/ SUB-SUPPLIER		MAIN-SUPPLIER					FOR NTPC USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL				






[Print](#)

BHARAT HEAVY ELECTRICALS LIMITED

**SUMMARY PACKING LIST FOR
EXPORT INVOICE NO : 912400536 DATE : 16:Aug:2024
CPC : 770350101**

SL No	PKG No	DESCRIPTION	NETWT (KG)	GRWT (KG)	L (mm)	B (mm)	H (mm)	VOL (CBM)	QTY	UNIT
1	BHEL/MTR/BD/EDN/CLB/98789	MISC SUNDRY SUPPLIES	11.5	31	635	559	508	0.1803	1	PKG
2	BHEL/MTR/BD/EDN/CLB/98790	MISC SUNDRY SUPPLIES	11.5	31	635	559	508	0.1803	1	PKG
3	BHEL/MTR/BD/EDN/CLB/98791	MISC SUNDRY SUPPLIES	11.5	31	635	559	508	0.1803	1	PKG
4	BHEL/MTR/BD/EDN/CLB/98792	MISC SUNDRY SUPPLIES	20	42.5	635	559	508	0.1803	1	PKG
5	BHEL/MTR/BD/EDN/CLB/98793	MISC SUNDRY SUPPLIES	20	42.5	635	559	508	0.1803	1	PKG
6	BHEL/MTR/BD/EDN/DCS/98856	MISC SUNDRY SUPPLIES	40	110	900	900	900	0.729	1	PKG
7	BHEL/MTR/BD/EDN/DCS/98857	MISC SUNDRY SUPPLIES	.5	5	300	300	200	0.018	1	PKG
TOTAL			115.0	293.0				1.6486		

[PDF Print](#)


Address of their warehouse is as under:

MR. ANUP GHOSH
JOYPUR BONGAON
NORTH 24 PGS
PIN-743235
WEST BENGAL

CONTACT PERSON : MR. ANUP GHOSH
CONTACT NO. 79085 08163

CONTACT PERSON :MR. RAJU GHOSH
CONTACT NO. 7029097784

CONTACT PERSON :MR. SUBRATA KUNDU
CONTACT NO. 8436497935

Please ensure that before dispatch from Manufacturing units/ Vendor Works, every individual package is mandatorily marked with unique package no (Sample packing list with package no, weight and dimensions enclosed for reference) and same package no will also be used for reporting, tracking, completing export/ import formalities till delivery to site). No material shall be received at warehouse without proper package no.

This issue may please be specially taken care of.

Also it is requested to kindly adhere to following volume/dimension limits for a Packing of package boxes -

<u>Description</u>	<u>Limit (Maximum)</u>
Volume	2 CBM
Length	2 m
Breadth	2 m
Height	1 m

In addition to above, may please note that max allowable weight limit for single lot under the contract finalized is 10 MT, therefore vendors are requested to kindly requested to keep package weight within this limit as well.

All vendors are requested to clearly mark package no. with indelible ink on the package/box as mentioned in the packing list and also instruct their vendors as well to do so, in case of direct dispatch from vendor works. Vendors are also to be advised to kindly share packing list in advance to BHEL so as to plan dispatch of material from warehouse



CORPORATE STANDARD

AA0490004

Rev. No. 01

PAGE 1 of 8

SEAWORTHY PACKING

(PACKING INSTRUCTIONS FOR GENERAL COMPONENTS / ASSEMBLIES / EQUIPMENTS)

1 GENERAL

This standard lays down packing instructions for packing of Components /Assemblies/ Equipments to be dispatched against Customer's contracts, for which there are no special instructions issued by the Engineering Departments.

The Components/Assemblies need to be packed suitably to avoid physical damage & corrosion during transit for storage. For specific applications the concerned engineering department shall issue a product standard. Reference of this standard, must appear in the Shipping list/Packing List.

2 SCOPE

This procedure gives minimum guidelines to be complied with for packing of Components /Assemblies / Equipments. This packing shall be suitable for different handling operations and for the adverse conditions during transportation and during indoor / outdoor storage for periods more than one year.

3 CROSS REFERED SPECIFICATION

- Expanded Polyethylene Foam Sheet : AA51420
- Packing Wood : AA51401
- Silica gel : AA55619
- Thermocole : AA51416
- Packing slip holders : AA7240901
- Corrugated Fibre Board : AA51414
- Rubber sheet : AA59001
- VCI paper : AA51406

4 WOOD SPECIFICATION FOR PACKING

The wood shall conform to specification AA51401.

5 TYPE OF PACKING

The following 5 types of packings have been standardized for packing of General Components /Assemblies.

- 'OP' - Open Type
- 'PP' - Partially Packed
- 'CP' - Crate Packing - Components/Equipments requiring physical protection
- 'CQ' - Case Packing - Small medium Components/ Assemblies/ Equipments which require corrosion & physical protection
- 'CR' - Case Packing - Electrical Components/Assemblies which require special packing viz. Water Proof, Shock Proof, etc.

Revisions: Committee changed from MRC-M&CD to PGC-Packing

APPROVED:
PROCEDURAL GUIDELINES COMMITTEE – PGC (Packing)

DRC-5191

Rev. No. 01	Amd. No.	Reaffirmed	Prepared HPEP, Hyderabad	Issued Corp. R&D	Dt. of 1 st Issue 17-08-2013
Dt: 12-06-2018	Dt:	Year: 21			

AA0490004	CORPORATE STANDARD	
Rev. No. 01		
PAGE 2 of 8		

6 DESCRIPTION OF TYPES OF PACKING

The various types of packing, as standardized above, are described below.

6.1 'OP' - Open Type

In case, of components which are not affected by water & dust & do not require special protection &, are generally not machined, shall be sent as open packages. However these components may be sent in crates, wherever necessary.

6.2 'PP' - Partially Packed

Components which need special protection, at selected portions only, shall be dispatched partially packed. Machined surfaces should not be allowed to come directly in contact with the wood. Such surfaces after application of TRP should be protected with Polyethylene Coated Bitumen Hessain Kraft Paper to AA51409 or Polyethylene sheet to AA51408 of at least 100 micron thickness.

6.3 'CP' - Crate Packing – General

Assemblies/Components which need only physical protection from the point of view of handling shall be dispatched duly packed in crates.

6.4 'CQ' - Case Packing - Machined Components/Assemblies/Equipments

- Small & Medium sized components/assemblies/equipments due to size/weight & to avoid handling, and pilferage, problems shall be packed in Case/Containers.
- Wherever required adequate quantity of silica gel to AA55619 or VCI Powder/ Tablets, packed in thin muslin cloth cotton bags shall be suitably placed.
- Small machines/components of less weight shall be provided with suitable cushioning. Wood Wool/Expanded Polyethylene Foam Sheet, if used, shall be sandwiched between polyethylene sheets and sealed.
- The components inside the case shall be entirely covered with a polyethylene sheet of at least 100 micron thickness to AA51408, where-ever required.

6.5 'CR' - Case Packing - Electrical & Electronic Components/Assemblies

Delicate components likely to be damaged e.g. Gauges, Instruments etc. are to be wrapped in waxed paper or polyethylene air bubble film and packed in cartons.

- Adequate quantity of Silica gel to AA55619 packed in cotton bags, of 100 grams each are to be suitably placed in the cartons. The cartons shall be entirely covered with a polyethylene sheet to AA51408 of at least 100 micron thickness, before being packed in the cases.
- VCI Powder/Tablets can be used as an alternative to Silica Gel to AA55619.
- Empty space in the cartons shall be filled with small chips of Expanded Polystyrene (Thermocole), Wood Wool etc. Polyethylene air bubble film shall conform to IS 12787/AA51420 Expanded polystyrene (Thermocole) shall conform to AA51416.
- The cartons shall be manufactured from corrugated Fibre Board, meeting requirements of AA51414.

6.6 Volatile Corrosion Inhibitor (VCI) Paper

- Un-protected surfaces of steel and cast iron components, tools bearing, shaft seals etc. are covered with VCI paper. VCI paper has been impregnated with corrosion inhibitors which by evaporation and chemical conversion protect metals in an enclosed area against corrosion.
- 7 m³ VCI paper is necessary for 1 m³ of packed item approximately as per AA51406.

Application Limitation:

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

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



CORPORATE STANDARD

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6.7 Moisture Absorber

Silica gel is used for this purpose to protect the contents over sufficiently long time from corrosion. At the time of use, silica gel should be so dried that its colour becomes dark blue. These shall be filled in small cotton bags. Before sealing the equipment, the silica gel bags should be kept inside the polyethylene film cover at different locations. The quantity of silica gel should not be less than 1.0 kg per cubic metre volume of the packing box

7 TYPE OF CASES

For specific requirement of packing the cases are to be provided with Tongue and Groove joints.

8 PREPARATION OF PACKING CASE

- 1) The base of the case shall be made of wooden batons for planks giving necessary reinforcement, such that the bottom of the equipment is at a height of 100 to 200 mm from the ground level depending upon size, ft weight of equipment. However for packing cases of smaller size equipment can be at a height of -40 mm from the ground level.
- 2) In case of 'CR1 - Packing Viz. Electrical & Electronic components for instruments/assemblies, a rubber sheet, Self-expanded polyethene foam sheet, preferably 10 mm thick, shall be fixed on to the base to act as cushioning to the equipment.
- 3) The four sides, shall be lined, from inside with packing paper water proof bitumen laminated to AA51410 Type – 1 or polyethylene sheet to AA51408 of at least 100 micron thickness and tacked at suitable places.

Whenever specified in addition to the bitumen laminated paper/polyethylene sheet the top cover will have a layer of bitumen felt over the cover. This should project about 100 - 250 mm on all sides.

It is preferable to have a single piece of the above Kraft paper fixed on the four sides. In case jointing is unavoidable, it should be done by overlapping of approximately 100 mm.

- 4) Place the Components/cartons with corrosion inhibitors duly applied wherever necessary for place suitably, thin muslin cloths bags containing 100 grams (approx.) of activated Blue Silica Gel to AA55619, wherever necessary. Alternatively VCI Powder or Tablet may be used.
- 5) In case, depression is formed, at the top, after the equipment is lowered, provide ply board/wooden batons.
- 6) Cover the whole equipment with polyethylene sheet of at least 100 micron thickness, on all sides preferably by a single piece.
- 7) For indoor panels/equipments, provide suitable packing batons with covering of Thermocole/expanded soft polyethylene foam/polyethylene air bubble film wrapped with suitable cords, to avoid cutting of the polyethylene sheet so that finished surface is not damaged.
- 8) Empty space in the box shall be filled with adequate cushioning material e.g. Thermocole Chips, Wood Wool etc. to avoid movement for shocks. Alternatively put wooden blocks/batons wherever necessary.
- 9) The inner side of the top cover shall be lined with polyethylene sheet, of at least
- 10) 100 micron thickness, which shall project approximately 25 to 150 mm depending upon the size of the case on all sides of the top cover shall be provided below the top cover. This projection, after nailing the top cover, shall be folded over, on the sides of the crates & tacked, to, prevent ingress of water from the top.

9 STEEL CONTAINERS

Steel containers for packing can be used in case of repeated supplies of the same equipment. Empty steel containers are to be returned back from customer's end and to be reused for the next supplies.

The containers are to be made of structural steel as per AA 10108 with proper reinforcement with I, C and T Sections.

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Following precautions are to be taken during packing:

- Put the Components/Assemblies/Equipments in the steel container properly. Cover the Components/Assemblies/Equipments with polythene.
- To arrest the movement in the steel container necessary wooden Blocks/Batons may be put.
- Put cover on steel, container and Bolt Properly.

10 SEALED PACKING

Components sub-assemblies and assemblies sensitive to climatic conditions shall be packed seal tight. All the openings of the sensitive components, sub-assemblies and assemblies shall be blanketed to prevent the ingress of dust and moisture.

The components sub-assemblies and assemblies are completely covered with 2 layers of polyethylene sheet. All sharp corners and edges are to be protected by rubber mats to prevent the polyethylene sheet from damage. Top surface of the case shall be free from dents to prevent rain water pockets.

11 SLING PLATE

Sling plate shall be provided to prevent damage to the packing box during lifting. Size of the sling plate shall be selected depending upon the net weight of the consignment.

12 PACKING SLIP HOLDERS

Two nos. steel packing slip holders, specification no. AA7240901 containing the packing list, sealed in thick polyethylene film, shall be fixed one inside and the other outside the packing box.

13 GENERAL PRECAUTIONS

- a) While fixing nails during packing, necessary care shall be taken to ensure that materials used for protection inside the case e.g. paper, polyethylene sheet, coir etc. do not get damaged.
- b) Sling protection brackets to be provided on cases wherever required.
- c) It shall be ensured that all stencil marks external, front & rear sides of the casing shall be of water proof Material to prevent obliteration in transit.
- d) The various caution signs shall be marked with stencil on both sides of the packing box.
- e) Do not pack any other Mechanical items with this case.

THE FOLLOWING DETAILS ARE TO BE MARKED ON THE PACKING CASES.

- a) Address of consignee.
- b) Purchase Order No./ SO No/WO No.
- c) Description of item or title of packing list.
- d) Case identification Number/ Packing List No.
- e) Net Weight.
- f) Gross Weight.
- g) Dimensions of box
- h) Marking showing upright position.
- i) Marking showing sling position.
- j) Marking showing umbrella (i.e. for machines/components to be stored under covered storage).
- k) Loading and unloading precautions



CORPORATE STANDARD

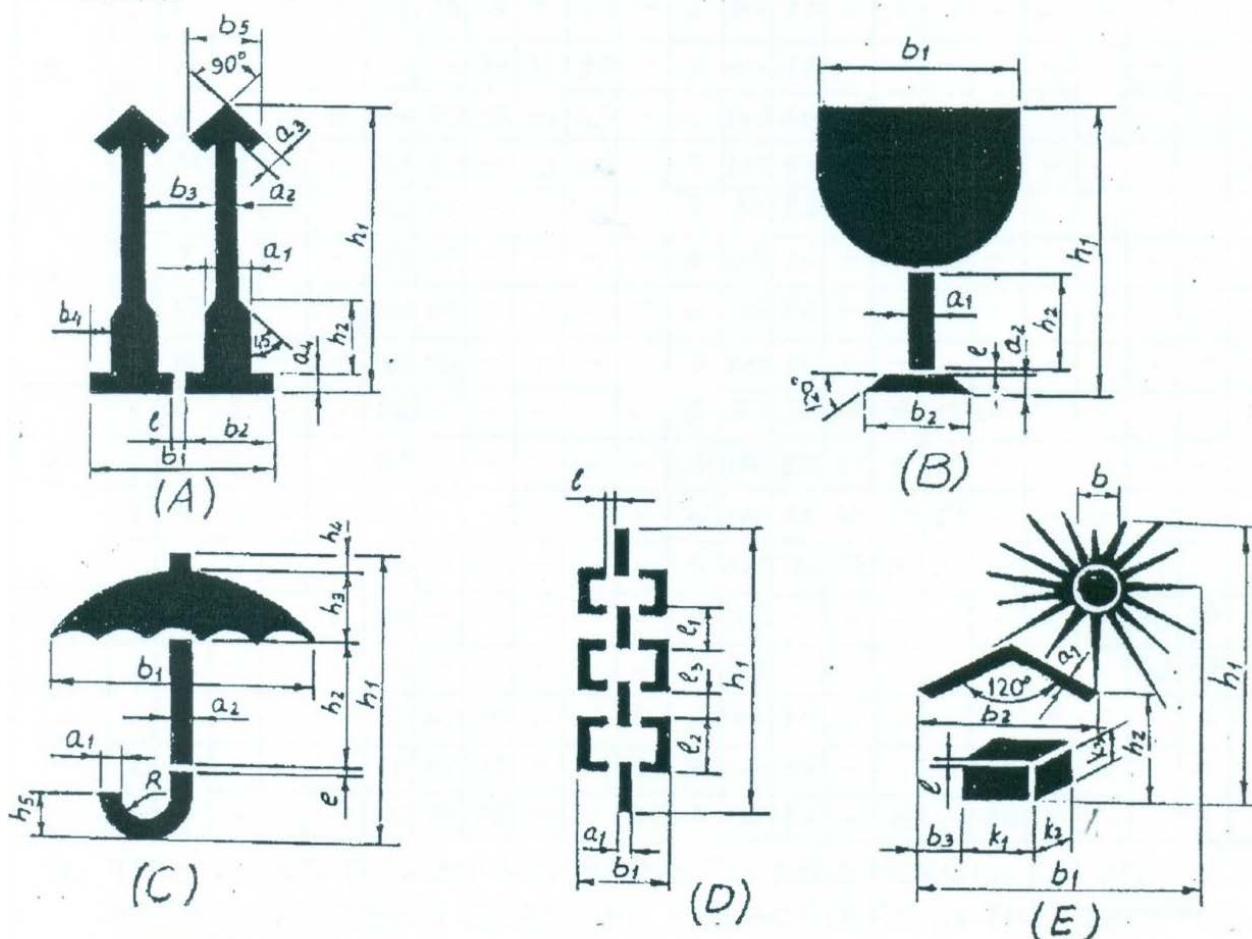
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MARKINGS ON PACKING CASES

1. THIS PLANT STANDARD PRESCRIBES THE VARIOUS CAUTION SIGNS AND OTHER MARKINGS ON PACKING CASES.
2. DIMENSIONS IN THE TABLE 1 SHALL BE USED FOR MAKING STENCILS ONLY.



- A. UPRIGHT
- B. FRAGILE
- C. PROTECTION FROM FALLING OR CONDENSING MOISTURE.
- D. SLINGING POSITION
- E. PROTECTION FROM DIRECT RADIATIONS.

Figure 1

CENTER OF GRAVITY

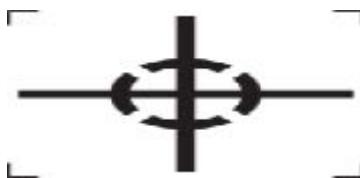


Figure 2

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Table 1

DESIGN- ATION	DIMENSIONS IN mm.																						
	a ₁	a ₂	a ₃	a ₄	b ₁	b ₂	b ₃	b ₄	b ₅	b	l	h ₁	h ₂	h ₃	h ₄	h ₅	K ₁	K ₂	K ₃	l ₁	l ₂	l ₃	R
A	1	12	5	5	4	52	25	19	8	21	-	2	84	23	-	-	-	-	-	-	-	-	-
	2	17	7	7	6	75	36	29	11	30	-	3	119	33	-	-	-	-	-	-	-	-	-
	3	24	10	10	8	104	50	38	16	42	-	4	168	46	-	-	-	-	-	-	-	-	-
	4	34	14	14	11	147	71	59	23	60	-	5	239	65	-	-	-	-	-	-	-	-	-
B	1	5	5	-	-	50	33	-	-	-	-	2	84	25	-	-	-	-	-	-	-	-	-
	2	7	7	-	-	71	47	-	-	-	-	3	119	36	-	-	-	-	-	-	-	-	-
	3	10	10	-	-	100	66	-	-	-	-	4	168	50	-	-	-	-	-	-	-	-	-
	4	14	14	-	-	142	94	-	-	-	-	5	239	71	-	-	-	-	-	-	-	-	-
C	1	4	3	-	-	66	-	-	-	-	-	2	80	39	19	5	11	-	-	-	-	-	6
	2	6	4	-	-	85	-	-	-	-	-	3	114	55	27	7	16	-	-	-	-	-	9
	3	8	6	-	-	120	-	-	-	-	-	4	160	78	38	10	22	-	-	-	-	-	12
	4	11	9	-	-	170	-	-	-	-	-	5	227	110	54	14	31	-	-	-	-	-	17
D	1	6	-	-	-	30	-	-	-	-	-	4	148	-	-	-	-	-	-	-	30	30	10
	2	9	-	-	-	42	-	-	-	-	-	5	209	-	-	-	-	-	-	-	42	42	14
E	1	3	-	-	-	69	47	10	-	-	16	2	91	26	-	-	-	17	8	11	-	-	-
	2	4	-	-	-	98	67	15	-	-	23	3	128	33	-	-	-	24	11	16	-	-	-
	3	6	-	-	-	138	94	20	-	-	32	4	182	62	-	-	-	34	16	22	-	-	-

Black and Red Marking Ink to IS: 1234 "Ink, Stencil, Oil Base, For Marking Porous Surfaces" or duplicating ink stencilling, oil base for marking porous surfaces.

All cases containing fragile items are to be stencilled with red marking and stencilling paint/ink.

"HANDLE WITH CARE", "FRAGILE DO NOT TURN OVER".

Besides the caution signs the product information shall be stencilled of letters with 13mm to 50mm height.

In case of consignment consists of more than one package, each package shall carry its Package No. as given in shipping list. All caution signs shall be stencilled in higher quality full glossy out door finishing paint red in colour (AA56126). All other markings shall be carried out in black enamel (AA56126).

Caution signs & other markings shall be stencilled on both the end shooks & the side shooks. Caution sign (for slinging) shall be stencilled only on side shooks at the appropriate place.

Note: In case the size of package is small for using the stencils, then hand written letters/figures shall be allowed.

14 PROCEDURE FOR HANDLING OF COMPONENTS

The purpose of this procedure is to protect the quality of the components/equipments while handling in various stages of manufacturing packing & despatching.



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- 14.1** Adequate care shall be taken in handling the material, and components to avoid damage during receipts, storage issue manufacture & despatch operations.
- 14.2** Appropriate material handling equipments like fork lifters, cranes etc. Shall be used where needed.
- 14.3** Lifting by crane and transportation by trolley of critical items and large components like rotors castings etc. Shall be done carefully.
- 14.4** For critical items, where specified, special handling fixtures shall be used for lifting.
- 14.5** Slings and shackles used for lifting the components/equipments shall be checked for fitness and suitability before use.
- 14.6** Slings used on machined surfaces shall be suitably padded. No slings shall be used on journal surfaces.
- 14.7** Precision machined components like blades, catches, rollers etc. Shall be lifted using suitable wooden pallets.

14.8 HANDLING OF COMPONENTS ON RECEIPT/DESPATCH:

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

- The markings showing the upright position.
- The markings showing the sling position
- Markings showing the fragile contents.
- Other required markings as per Clause No. 13

- 14.8.1** Appropriate cranes and slings should be used for different components/ cases. Slings should normally make an angle as minimum as possible (width wise) but in no case more than 15°.
- 14.8.2** Handling and lifting should be done without jerks or impacts.
- 14.8.3** Immediately after receipt of the goods, the packing should be examined all-round for any sign of damage. If necessary, lift the cover or a number of boards of the case so as to make the contents visible. In the event of sealed packing being used the plastic sheeting should not be damaged. It is imperative that the packing material is restored in original condition after the inspection.
- 14.8.4** On receipt of the equipment it should be checked with the shipping list and missing or damage if any should be reported immediately. It is important to arrange for immediate examination to determine the extent of the damage, the cause of the damage and where applicable the person or persons responsible for the damage. According to general practice when transporting by railway or by road vehicle the carrier concerned should be immediately called upon (within specified periods) for jointly establishing a statement of the damage. This is essential as a basis for a subsequent claim and possible damage report to the insurance company.
- 14.8.5** Protective coating applied on machined surfaces should not be disturbed. The plastic covering should be put back carefully so that it prevents ingress of dust and moisture. Some packing may have vapour phase inhibitor (VPI) paper enclosed inside the packing cases. This should be restored to its original place as far as possible.
- 14.8.6** Silica gel and such other chemicals kept in the box as desiccants and indicators should also be left in the box itself.

15 GI SHEET

The packing cases are covered with GI sheet on outside for sides and top; inside for bottom as per the Figure-3.

16 TREATMENT of Wood

Treatment of wood is as per ISPM 15: 2009

AA0490004

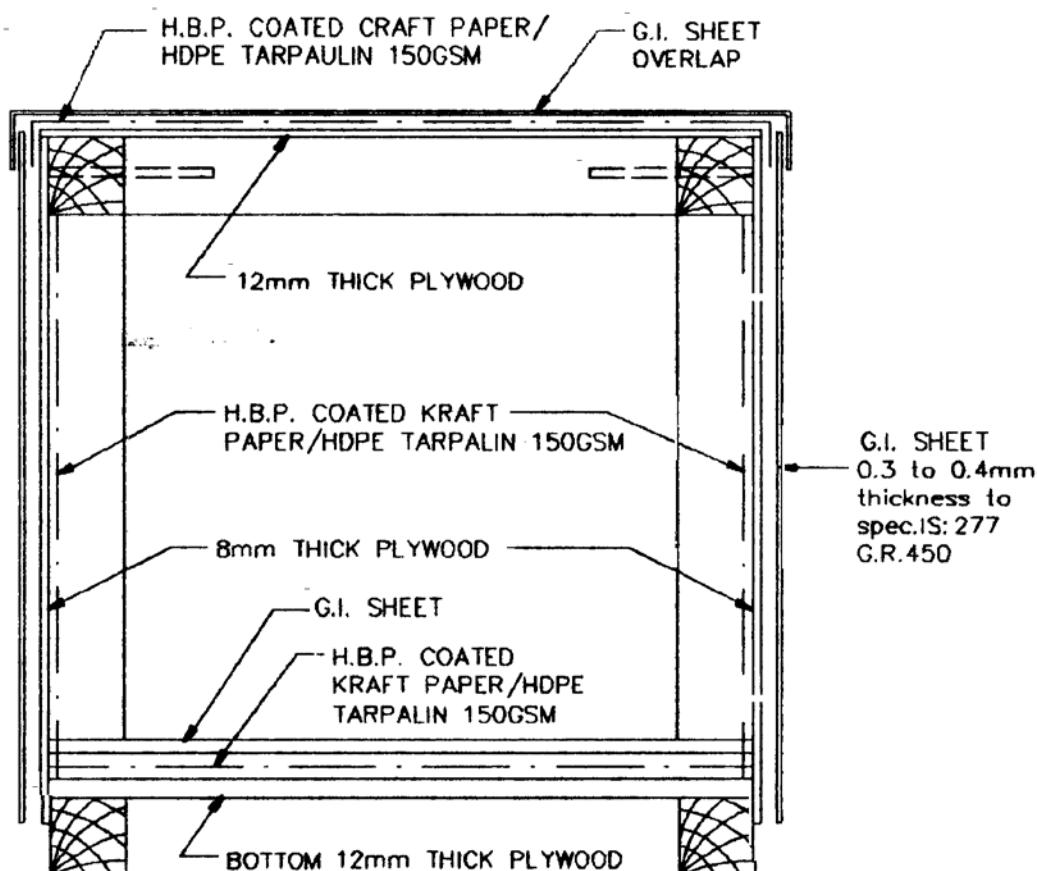
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CORPORATE STANDARD**17 PROVISION FOR INSPECTION**

This clause is applicable only where contractual requirement of customer is there. For other packings this is not applicable.

Each transportable packing's shall have provision for inspection by customer authority etc. during transport from origin of dispatched till destination. This inspection may require opening of the package and subsequently closing it again. For this purpose suitable designed opening with bolted cover shall be provided. Such an opening shall be clearly marked as "OPENING" with clear instruction for opening & closing written on this cover. For large consignment the size of the opening shall be suitable to facilitate entry of personnel.



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

Figure 3



CORPORATE STANDARD

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EXPORT PACKING

(PACKING INSTRUCTIONS FOR GENERAL COMPONENTS / ASSEMBLIES / EQUIPMENT)

1 GENERAL

This standard lays down packing instructions for export packing of components/assemblies/equipment to be dispatched against Customer's contracts, for which there are no special instructions issued by the Engineering Departments.

The components/assemblies need to be packed suitably to avoid physical damage & corrosion during transit for storage. For specific applications, the concerned engineering department shall issue a product standard. Reference of this standard, must appear in the Shipping list/Packing List.

2 SCOPE

This procedure gives minimum guidelines for export packing to be complied with for packing of components/assemblies/equipment. This packing shall be suitable for different handling operations and for the adverse conditions during transportation and during indoor / outdoor storage for periods more than one year.

3 WOOD SPECIFICATION FOR PACKING:

- a) The wood shall conform to specification AA51401.
- b) Ply Wood planks as per specification IS:303 Gr. "MR" Type A,B are used for the sides, top & bottom of the packing cases.
- c) Ply Wood of marine grade as per IS:710 for packing of control equipment and for support batten pinewood to be used as per specification AA51401.

4 TYPE OF PACKING:

The following types of packings have been standardized for packing of general components/assemblies.

4.1 Open Type:

Packing subjected to BHEL approval.

4.2 Closed packing cases:

- a) Export packing of the specific items requiring additional protection shall be covered with G.I. sheet covering as per customer/contractual/engineering requirements. G.I. shall conform to specification AA10166.
- b) Any other special or export seaworthy packing (improvement or equivalent to the above) shall be subjected to BHEL Engg & QC approval).

4.3 Special Packing

Components requiring special packing (as per customer/contractual/ engineering requirements) not included in this specification shall be covered by product standards.

5 TREATMENT OF WOOD AS PER ISPM-15

As per customer requirement for export packing, wood to be treated as per International Standards for Phytosanitary Measures ISPM:15.

Revisions:			APPROVED: PROCEDURAL GUIDELINES COMMITTEE – PGC (Packing)		
Rev. No. 01	Amd. No.	Reaffirmed	Prepared HEP, Bhopal	Issued Corp. R&D	Dt. of 1 st Issue 31-05-2018
Dt: 12-06-2018	Dt:	Year: 44			

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6 PREPARATION OF PACKING CASE:

- 1) Export items are to be packed in sea worthy wooden/Ply board cases.
- 2) The base of the case shall be made of wooden battens for planks giving necessary reinforcement, such that the bottom of the equipment is at a height of 100 to 200mm from the ground level depending upon size & weight of equipment. However for packing cases of smaller size equipment can be at a height of 40mm from the ground level.
- 3) The four sides & top cover shall be lined, from inside with multi-layered cross-laminated polyethylene sheet of 90GSM as per AA51420 and tacked at suitable places.
Whenever specified the top cover will have a layer of multi-layered cross laminated polyethylene sheet of 90 GSM over the cover. This should project about 100 - 250mm on all sides.
It is preferable to have a single piece of the above Multi-layered cross laminated polyethylene sheet fixed on the four sides. In case jointing is unavoidable, it should be done by overlapping of approximately 100mm.
- 4) Put the job on the base and wherever necessary may be screwed / fastened.
- 5) In case of delicate component Packing Viz. Electrical & Electronic components for instruments/ assemblies, a rubber sheet, Self-expanded polyethene foam sheet as per AA51423, preferably 10mm thick, shall be fixed on to the base to act as cushioning to the equipment.
- 6) Place the Components/cartons with corrosion inhibitors duly applied wherever necessary for place suitably, thin muslin cloths bags containing 100grams (approx.) of activated Blue Silica Gel to AA55619, wherever necessary. Alternatively VCI Powder or Tablet may be used.
- 7) In case, depression is formed, at the top, after the equipment is lowered, provide ply board/wooden batons.
- 8) Whole Equipment shall be covered and sealed with Multi-layered cross-laminated Polyethylene sheet to AA51420.
- 9) For indoor panels/equipment, provide suitable packing batons with covering of Thermocole/ expanded soft polyethylene foam/polyethylene air bubble film wrapped with suitable cords, to avoid cutting of the polyethylene sheet so that finished surface is not damaged.
- 10) Empty space in the box shall be filled with adequate cushioning material e.g. Thermocole Chips, Wood Wool etc. to avoid movement for shocks. Alternatively put wooden blocks/batons wherever necessary.
- 11) The inner side of the top cover shall be lined with M.L.C. laminated polyethylene sheet of at least 90GSM, which shall project approximately 25 to 150mm depending upon the size of the case on all sides of the top cover shall be provided below the top cover. This projection, after nailing the top cover, shall be folded over, on the sides of the crates & tacked, to, prevent ingress of water from the top.
- 12) For specific applications requiring additional protection the packing cases are covered with GI sheet on outside for sides and top; inside for bottom as per specification AA10166, thickness of G.I. sheet shall be 0.25mm.
- 13) For specific applications requiring inspection, additional inspection window has to be provided for custom clearance for export jobs.

7 SEALED PACKING:

Components sub-assemblies and assemblies sensitive to climatic conditions shall be packed seal tight. All the openings of the sensitive components, sub-assemblies and assemblies shall be blanketed to prevent the ingress of dust and moisture.

The components sub-assemblies and assemblies are completely covered with 2 layers of M.L.C. laminated poly film. All sharp corners and edges are to be protected by rubber mats to prevent the polyethylene sheet from damage. Top surface of the case shall be free from dents to prevent rain water pockets.

Certain special precautions are required for seal tight packing of specific item have to be covered by product standard.



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8 OTHER PACKING MATERIAL

8.1 Volatile Corrosion Inhibitor (VCI) Paper as per AA51406:

- a) Un-protected surfaces of steel and cast iron components, tools bearing, shaft seals etc. are covered with VCI paper. VCI paper has been impregnated with corrosion inhibitors which by evaporation and chemical conversion protect metals in an enclosed area against corrosion.
- b) 7m³ VCI paper is necessary for 1 m³ of packed item approximately as per AA51406.

Application Limitation:

VCI paper shall not be used for components made of aluminium, aluminium alloys as well as Zinc, copper, brass, cadmium and silver. VCI powder is sprinkled inside the piping components ends shall be protected with end cover as specified in plant standards, drawings.

8.2 Moisture Absorber:

Silica gel is used for this purpose to protect the contents over sufficiently long time from corrosion. At the time of use, silica gel should be so dried that its colour becomes dark blue. These shall be filled in small cotton bags. Before sealing the equipment, the silica gel bags should be kept inside the polyethylene film cover at different locations. The quantity of silica gel depends on the dimension of the polyethylene sheet as well as transit and storage time.

8.3 Sling Plate:

Sling plate shall be provided to prevent damage to the packing box during lifting. Size of the sling plate shall be selected depending upon the net weight of the consignment.

8.4 Packing Slip Holders:

Two nos. of packing list with suitable protecting cover shall be fixed one inside and the other outside of the packing box as per specification AA7240901.

8.5 Nails

The length and diameter of the nails depends upon the size of planks

8.6 Strapping Strips:

These are used for strapping the boxes. Suitable size of box strapping strip can be used as per size and weight of consignment. The material shall be free from rust.

8.7 Brackets:

These brackets are used for nailing to the corners of cubicle boxes. The brackets shall be of "L" shape, suitable holes shall be provided towards the end of each side for screwing /nailing.

8.8 Fasteners:

Bolts, double nuts, spring washers of suitable size 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.

8.9 Polyethylene Sheet:

The polyethylene sheets are used to make covers to the jobs individually. multi-layered cross laminated polyethylene sheet as per AA 51420 can be used for packing of jobs.

8.10 Expanded Poly Foam Sheet and Air Bubble Film:

This item is used for covering the delicate items, Expanded Polyethylene Foam Sheet as per specification AA51423 and air bubble film as per specification AA51426

8.11 Thermocol (Expanded Polystyrene) Sheets:

This is used for covering delicate items. This material shall be as per spec. no AA51416

8.12 Cotton Bags:

These are used for holding silica gel.

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8.13 Marking Ink:

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

8.14 Polyethylene Bags:

These are to be used for keeping the, Packing slips. The bag shall be of size 70 mm X 100 mm (minimum).

8.15 Mechanical Latching Clamps:

For specific items self locking clamps can also be used on need basis in conjunction with or apart from regular bolt and nut fixing arrangement, if needed.

9 DESIGN OF PACKING BOXES

Design/drawing of packing boxes shall be prepared based on actual weight and size of the equipment and shall be covered by concern product standards.

10 GENERAL PRECAUTIONS:

- 1) While fixing nails during packing, necessary care shall be taken to ensure that materials used for protection inside the case e.g. paper, polyethylene sheet, coir etc. do not get damaged.
- 2) Sling protection brackets to be provided on cases wherever required.
- 3) It shall be ensured that all stencil marks external, front & rear sides of the casing shall be of water proof Material to prevent obliteration in transit.
- 4) For packing of small/delicate items - Item may be wrapped properly with M.L.C. laminated polyethylene and wrapped item may be further wrapped with air bubble film as per spec. AA51426, these curtains will be subsequently packed in wooden/ply boxes as at clause 8.0.
- 5) The various caution signs shall be marked with stencil on both sides of the packing box.
- 6) Instructions on handling,storage, preservation, represervation and transport of export order components at works and site shall be covered by product standards.

11 MARKING

The following details are to be marked on the packing cases.

- a) Address of consignee.
- b) Purchase Order No.
- c) Description of item or title of packing list.
- d) Case identification Number.
- e) Net Weight.
- f) Gross Weight.
- g) Dimensions of box
- h) Marking showing upright position.
- i) Marking showing sling position.
- j) Marking showing umbrella (i.e. for machines/components to be stored under covered storage).



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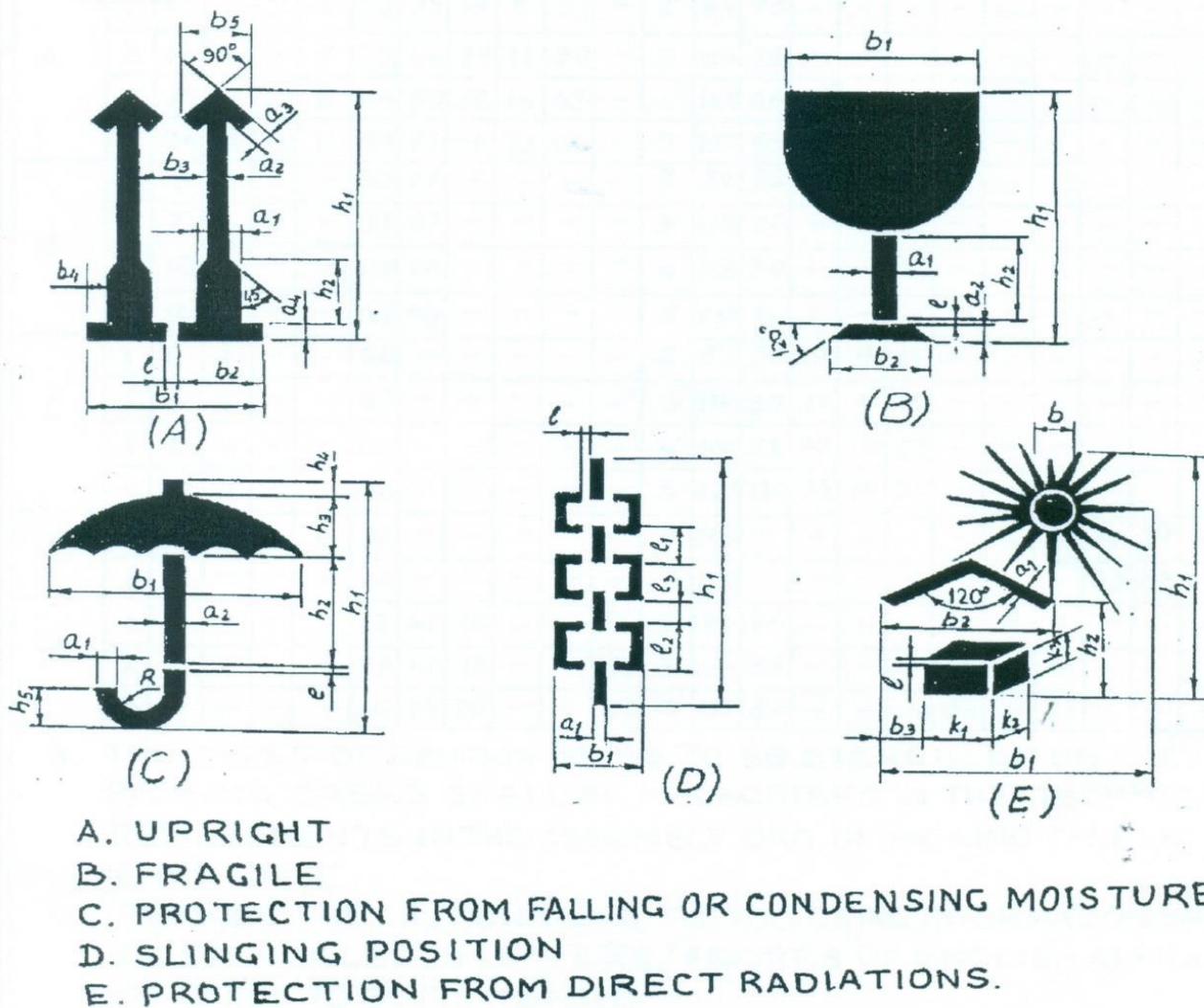
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MARKINGS ON PACKING CASES

1. THIS PLANT STANDARD PRESCRIBES THE VARIOUS CAUTION SIGNS AND OTHER MARKINGS ON PACKING CASES.
2. DIMENSIONS IN THE TABLE 1 SHALL BE USED FOR MAKING STENCILS ONLY.



CENTER OF GRAVITY



Figure 1 – Markings

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DESIGN- ATION	DIMENSIONS IN mm.																						
	a ₁	a ₂	a ₃	a ₄	b ₁	b ₂	b ₃	b ₄	b ₅	b	l	h ₁	h ₂	h ₃	h ₄	h ₅	k ₁	k ₂	k ₃	l ₁	l ₂	l ₃	R
A	1	12	5	5	4	52	25	19	8	21	-	2	84	23	-	-	-	-	-	-	-	-	-
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	2	6	4	-	-	85	-	-	-	-	3	114	55	27	7	16	-	-	-	-	-	-	9
	3	8	6	-	-	120	-	-	-	-	4	160	78	38	10	22	-	-	-	-	-	-	12
	4	11	9	-	-	170	-	-	-	-	5	227	110	54	14	31	-	-	-	-	-	-	17
D	1	6	-	-	-	30	-	-	-	-	4	148	-	-	-	-	-	-	30	30	10	-	
	2	9	-	-	-	42	-	-	-	-	5	209	-	-	-	-	-	-	42	42	14	-	
E	1	3	-	-	-	69	47	10	-	-	16	2	91	26	-	-	17	8	11	-	-	-	-
	2	4	-	-	-	98	67	15	-	-	23	3	128	33	-	-	24	11	16	-	-	-	-
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- 1) Adequate care shall be taken in handling the material, and components to avoid damage during receipts, storage issue manufacture & despatch operations.
- 2) Appropriate material handling equipment like fork lifters, cranes etc. Shall be used where needed.
- 3) Lifting by crane and transportation by trolley of critical items and large components like rotors castings etc. Shall be done carefully.



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- 4) For critical items, where specified, special handling fixtures shall be used for lifting.
- 5) Slings and shackles used for lifting the components/equipment shall be checked for fitness and suitability before use.
- 6) Slings used on machined surfaces shall be suitably padded. No slings shall be used on journal surfaces.
- 7) Precision machined components like blades, catches, rollers etc. Shall be lifted using suitable wooden pallets.

8) HANDLING OF COMPONENTS ON RECEIPT/DESPATCH:

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

- The markings showing the upright position.
- The markings showing the sling position
- Markings showing the fragile contents.
- Other required markings as per Cl.No:11
 - a) Appropriate cranes and slings should be used for different components/ cases. Slings should normally make an angle as minimum as possible (width wise) but in no case more than 15°.
 - b) Handling and lifting should be done without jerks or impacts.
 - c) Immediately after receipt of the goods, the packing should be examined all-round for any sign of damage. If necessary, lift the cover or a number of boards of the case so as to make the contents visible. In the event of sealed packing being used the plastic sheeting should not be damaged. It is imperative that the packing material is restored in original condition after the inspection.
 - d) On receipt of the equipment it should be checked with the shipping list and missing or damage if any should be reported immediately. It is important to arrange for immediate examination to determine the extent of the damage, the cause of the damage and where applicable the person or persons responsible for the damage. According to general practice when transporting by railway or by road vehicle the carrier concerned should be immediately called upon (within specified periods) for jointly establishing a statement of the damage. This is essential as a basis for a subsequent claim and possible damage report to the insurance company.
 - e) Protective coating applied on machined surfaces should not be disturbed. The plastic covering should be put back carefully so that it prevents ingress of dust and moisture. Some packing may have vapour phase inhibitor (VPI) paper enclosed inside the packing cases. This should be restored to its original place as far as possible.
 - f) Silica gel and such other chemicals kept in the box as desiccants and indicators should also be left in the box itself.

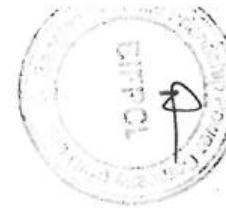
13 PROVISION FOR INSPECTION:

This clause is applicable only where contractual requirement of customer is there. For other packings this is not applicable.

Each transportable packing's shall have provision for inspection by customer authority etc. during transport from origin of dispatched until destination. This inspection may require opening of the package and subsequently closing it again. For this purpose, suitable designed opening with bolted cover shall be provided. Such an opening shall be clearly marked as "OPENING" with clear instruction for opening & closing written on this cover. For large consignment, the size of the opening shall be suitable to facilitate entry of personnel.

14 REFERRED STANDARDS (Latest publications including amendments):

1) AA51401	2) IS:303	3)IS:710	4)AA10166
5)ISPM:15	6)AA51420	7)AA51423	8)55619
9)AA51406	10)AA51416	11)AA51426	12)AA56126



Coating Systems

System-No.	Surface location	Temp. °C	Surface preparation	Coating systems	No. of coats	Generic type	Dry film thickness (DFT) per coat μm	Total DFT μm
2	Structural steel works, piping, vessels, tanks OUTDOOR	up to 120	SA 2.5	Primer	1	Zinc-Epoxy	80	80
				Intermediate	1 - 2	Epoxy High Solid	160	160
				Finish	1	2-Comp. Polyurethane	50	50 290

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Equipment and Piping Colour Code

For colour code for all equipment and piping see table below, for any other items Employer's approval shall be obtained. For safety issues relevant standards and regulations shall prevail in case of discrepancy. Final colour selection is to be discussed and approved by Employer.

Colour Code (based on DIN 2403:2007-05 & DIN 5381)

Medium	Base	RAL	Band/ Ring	RAL	Let- tering	RAL
Fire fighting, e.g. fire fighting water	Signal Red	3001				
		9003	Signal White			

