



REQUIREMENT OF SAND CASTED ROUND OF DIAMETER ETC.

The Heavy Electricals Equipment Plant (HEEP) located in Haridwar, India is one of the major manufacturing plants of Bharat Heavy Electricals Ltd. The core business of HEEP includes design and manufacture of large steam and gas turbines, turbo generators, Defense Items and so on.

Details of items details as below:

SI. NO.	MAT CODE	ITEM DISCREPTION	Quantity (Nos.)	Delivery (Days)
1	W93078200019	SAND CASTED ROUND OF DIAMETER D=18MM & LENGTH L=300MM IN ROUGH MACHINED CONDITION N STD AA19936	8	45
2	W93078200027	SAND CASTED ROUND OF DIAMETER D=24MM & LENGTH=300MM IN ROUGH MACHINED CONDITION N STD AA19936	22	45
3	W93078200035	SAND CASTED ROUND OF DIAMETER D=32MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N STD AA19936	13	45
4	W93078200043	SAND CASTED ROUND OF DIAMETER D=42MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N STD AA19936	12	45
5	W93078200060	SAND CASTED ROUND OF DIAMETER D=60MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N STD AA19936	11	45
6	W93078200078	SAND CASTED ROUND OF DIAMETER D=80MM & LENGTH L=300MM IN ROUGH MACHINED CONDITION N STD AA19936	19	45
7	W93078200086	SAND CASTED ROUND OF DIAMETER D=100MM & LENGTH L=500MM IN ROUGH MACHINED CONDITION N STD AA19936	10	45
8	W93078200094	SAND CASTED ROUND OF DIAMETER D=130MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N STD AA19936	11	45
9	W93078200108	SAND CASTED ROUND OF DIAMETER D=45MM & LENGTH L=500MM IN ROUGH MACHINED CONDITION N STD AA19940	18	45

10	W93078200116	CASTED & ROUGH MACHINED ROUND OF LENGTH L=300 MM SIZE: D = 46MM, DIM.: DIA N STD AA19941	10	45
11	W93078200124	CASTED & ROUGH MACHINED ROUND OF LENGTH L = 300 MM SIZE: D = 70 MM DIM.: DIA N STD AA19941	8	45
12	W93078200132	CASTED & ROUGH MACHINED ROUND LENGTH= 300 MM SIZE: D=80 DIM.: DIA N STD AA19941	5	45
13	W93078205037	DRG: 37829913130 REV 00 CENTRIFUGAL CHILL CAST GUIDE BUSHING ROUGH MACHINED AS PER CASTING P/N 37829913130 FOR FINISH MACHINING AS PER P/N 1376-05-130 N STD AA 19936	3	45
14	W93078299112	DRG: 47829913208 REV 00 CENTRIFUGAL CHILL CAST BUSHING GUN BARREL ROUGH MACHINED AS PER CASTING P/N 47829913208 FOR FINISH MACHINING AS PER P/N 1376-05-208 N STD AA 19936	3	45

1. ALL VENDORS TO PROVIDE POINT WISE REPLY/CONFIRMATION ALONG WITH RELEVANT SUPPORTING DOCUMENTS TO EACH AND EVERY POINT OF PRE-QUALIFICATION REQUIREMENT/PQR FOR ALL ENQUIRY ITEMS. NONCOMPLIANCE OF THESE MAY LEAD TO REJECTION OF OFFER AS THESE ARE ESSENTIAL CONDITION FOR PARTICIPATING IN TENDER ENQUIRY
2. KINDLY UPLOAD/ATTACH THE SPECIFICATION DETAILS/ CATALOGUE OF OFFERED ITEMS.
3. KINDLY ARRANGE TO **SUBMIT TECHNO-COMMERCIAL CHECKLIST** ALONG WITH YOUR OFFER.
4. VENDOR TO CONFIRM TO PROVIDE MATERIAL PROPERTIES TEST REPORTS (ACTUAL REPORT FOR 100% QUANTITIES) OF CASTING AS PER ENQUIRY.
5. VENDOR TO CONFIRM TO PROVIDE D.P. & DIMENSIONAL TEST REPORTS OF CASTING AS PER ENQUIRY SPECIFICATION.
6. VENDOR TO CONFIRM TO PROVIDE TEST CERTIFICATES KEEP PROPER CORRELATION WITH PO ITEMS AND THEIR QUANTITY.
7. VENDOR TO CONFIRM TO PROVIDE CERTIFICATE OF CONFORMANCE ALONG WITH MATERIAL DISPATCH.
8. VENDOR TO CONFIRM TO PROVIDE IDENTIFICATION OF ALL ITEMS AND THEIR REPORT ACCORDINGLY.

QUALIFYING CONDITIONS for SAND CASTED ROUNDS

Only those manufacturers or authorized dealer/distributor of Original Equipment Manufacturers, should quote:

Sl. no.	PQR Requirement	Action	Vendor Response (Yes / No)
1.	who can manufacture or supply a) Phosphorus-Bronze Sand, Chill and Centrifugal Casting as per BHEL specification AA19936 b) Tin Bronze Sand and Chill Casting as per BHEL specification AA19940. c) Leaded Gun Metal Sand Casting as per BHEL specification AA19941	Vendor to confirm	
2.	who has read and understood the BHEL specification AA19936 AA19940 & AA19941.	Vendor to confirm	
3.	who can arrange material as per specification AA19936, AA19940 & AA19941. In case of any deviation/substitution, prior approval is required from BHEL.	Vendor to confirm	
4.	who can provide Material Test Certificate (MTC) from NABL accredited labs/Govt. approved Labs or OEM Labs	Vendor to confirm	
5.	who can provide Test reports	Vendor to confirm	
6.	<i>All the above points are the Mandatory Qualification Requirements. Offers of vendors not meeting these requirements will NOT be considered.</i>	Vendor to accept & confirm	

TECHNO-COMMERCIAL CHECKLIST

SL. NO.	TERMS & CONDITION	VENDOR CONFIRMATION /REMARKS / REPLY
1	BIDDER NAME	
2	GEM BID NO	
3	ITEM IS TO BE SUPPLIED AS PER TECHNICAL SPECIFICATION	
4	ALL VENDORS TO PROVIDE POINT WISE REPLY/CONFIRMATION ALONG WITH RELEVANT SUPPORTING DOCUMENTS TO EACH AND EVERY POINT OF PRE-QUALIFICATION REQUIREMENT/PQR FOR ALL ENQUIRY ITEMS. NONCOMPLIANCE OF THESE MAY LEAD TO REJECTION OF OFFER AS THESE ARE ESSENTIAL CONDITION FOR PARTICIPATING IN TENDER ENQUIRY	
5	KINDLY UPLOAD/ATTACH THE SPECIFICATION DETAILS/ CATALOGUE OF OFFERED ITEMS.	
6	VENDOR TO CONFIRM TO PROVIDE MATERIAL PROPERTIES TEST REPORTS (ACTUAL REPORT FOR 100% QUANTITIES) OF CASTING AS PER ENQUIRY	
7	VENDOR TO CONFIRM TO PROVIDE D.P. & DIMENSIONAL TEST REPORTS OF CASTING AS PER ENQUIRY SPECIFICATION	
8	VENDOR TO CONFIRM TO PROVIDE TEST CERTIFICATES KEEP PROPER CORRELATION WITH PO ITEMS AND THEIR QUANTITY	
9	VENDOR TO CONFIRM TO PROVIDE CERTIFICATE OF CONFORMANCE ALONG WITH MATERIAL DISPATCH.	
10	VENDOR TO CONFIRM TO PROVIDE IDENTIFICATION OF ALL ITEMS AND THEIR REPORT ACCORDINGLY	
11	<p>RISK PURCHASE: IN CASE OF ABNORMAL DELAYS (BEYOND THE MAXIMUM LATE DELIVERY PERIOD AS PER LD CLAUSE) IN SUPPLIES / DEFECTIVE SUPPLIES OR NONFULFILLMENT OF ANY OTHER TERMS AND CONDITIONS GIVEN IN PURCHASE ORDER, BHEL MAY CANCEL THE PURCHASE ORDER IN FULL OR PART THEREOF, AND MAY ALSO MAKE THE PURCHASE OF SUCH MATERIAL FROM ELSEWHERE / ALTERNATIVE SOURCE AT THE RISK AND COST OF THE SUPPLIER. BHEL WILL TAKE ALL REASONABLE STEPS TO GET THE MATERIAL FROM ALTERNATE SOURCE AT OPTIMUM COST. IF BIDDER DOES NOT AGREE TO THE ABOVE RISK PURCHASE CLAUSE, BHEL RESERVES THE RIGHT TO REJECT THE OFFER. IN CASE FOR COMPELLING REASONS BHEL ACCEPTS THE OFFER WITHOUT ACCEPTANCE OF THIS CLAUSE BY THE BIDDER AND IN THE EVENTUALITY OF RISK PURCHASE, APPROPRIATE ACTION WILL BE TAKEN AS PER BHEL EXTANT RULES. THIS WILL BE WITHOUT PREJUDICE TO ANY OTHER RIGHT OF BHEL UNDER THE CONTRACT OR UNDER GENERAL LAW.</p>	
12	<p>ACTION AGAINST BIDDERS / VENDOR / SUPPLIER / CONTRACTOR IN CASE OF DEFAULT: IN ORDER TO PROTECT THE COMMERCIAL INTERESTS OF BHEL, BHEL SHALL TAKE ACTION AGAINST SUPPLIES / CONTRACTORS BY WAY OF SUSPENSION OF BUSINESS DEALINGS, WHO EITHER FAIL TO PERFORM OR ARE IN DEFAULT WITHOUT ANY REASONABLE CAUSE, CAUSE LOSS OF BUSINESS/ MONEY/ REPUTATION, INDULGE IN MALPRACTICES, CHEATING, BRIBERY, FRAUD OR ANY OTHER MISCONDUCT OR FORMATION OF CARTELS SO AS TO INFLUENCE THE BIDDING PROCESS OR INFLUENCE THE PRICE ETC.</p> <p>SUSPENSION OF BUSINESS DEALINGS COULD BE IN THE FORM OF "HOLD" OR "BANNING" A SUPPLIER/ CONTRACTOR OR A BIDDER AND SHALL BE AS PER "GUIDELINES FOR SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS/ CONTRACTORS" AVAILABLE AT BHEL'S WEBSITE "https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors"</p>	

MAKE IN INDIA SELF CERTIFICATION

As per Government Public procurement order no. P-45021/2/2017-BE-II dt.15.06.2017 & P45021/2/2017-PP(BE-II) dated 28.05.2018,29.5.2019, 04.6.2020 and amendment dated 16.09.2020, it is hereby certifying that we

.....
..... (supplier name) are(Class-I/Class-II)
local supplier and will meet the requirement of minimum local content of
(50%/20%) as defined in public procurement order dated 04.6.2020 for material against Enquiry no.
..... Details of
location at which local value addition will be made is as follows: -
.....
.....
.....

We also understand, false declarations will be in breach of the code of integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the general financial rules along with such other actions as may be permissible under law.

Note:

As per office order P-45021/102/2019-BE-II-Part (1) (E-50310) Dated 04/03/2021, Bidders can't claim itself as "Class-I local supplier/Class-II local suppliers" by claiming the service such as transportation, insurance, installation, commissioning, training & after sales service support like AMC/CMC etc. as local value addition. Bidder offering imported product will fall under the category of Non-Local supplier.

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-II) dtd:.....,
Category: (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on
date..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs.....Lacs

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / Small (Strike off which is not applicable)
Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant



1. ALL VENDORS TO PROVIDE POINT WISE REPLY/CONFIRMATION ALONG WITH RELEVANT SUPPORTING DOCUMENTS TO EACH AND EVERY POINT OF **PRE-QUALIFICATION REQUIREMENT/PQR** FOR ALL ENQUIRY ITEMS. NONCOMPLIANCE OF THESE MAY LEAD TO REJECTION OF OFFER AS THESE ARE ESSENTIAL CONDITION FOR PARTICIPATING IN TENDER ENQUIRY.
2. KINDLY UPLOAD/ATTACH THE SPECIFICATION DETAILS/ CATALOGUE OF OFFERED ITEMS.
3. KINDLY ARRANGE TO **SUBMIT TECHNO-COMMERCIAL CHECKLIST** ALONG WITH YOUR OFFER.
4. VENDOR TO CONFIRM TO PROVIDE TECHNICAL DATASHEET/CATALOGUE OF MATERIALS AS PER ENQUIRY DOCUMENTS.
5. VENDOR TO CONFIRM TO PROVIDE MATERIAL PROPERTIES TEST REPORTS (ACTUAL REPORT FOR 100% QUANTITIES) OF CASTING AS PER ENQUIRY.
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9. VENDOR TO CONFIRM TO PROVIDE IDENTIFICATION OF ALL ITEMS AND THEIR REPORT ACCORDINGLY.
10. KINDLY MENTION THE GEM TENDER NO IN THE EMD NARRATION/REMARKS, WHILE SUBMITTED THE EMD THROUGH RTGS.
11. VENDOR REGISTERED WITH BHEL-HEEP, HARIDWAR IN PMD (PRODUCT MATERIAL DIRECTORY) DF014 ARE EXEMPTED FROM SUBMISSION OF EMD.
12. VENDOR NOT SUBMITTING EMD WILL BE OUT RIGHTLY REJECTED EXCEPT THOSE EXEMPTED UNDER POINT NO 11.
13. BIDDERS CAN ALSO SUBMIT THE EMD WITH PAYMENT ONLINE THROUGH RTGS / INTERNET BANKING IN BENEFICIARY NAME BHEL HEEP HARIDWAR **ACCOUNT NO. 1 0 6 6 7 9 9 5 4 5 8** IFSC CODE **SBIN0000586** BANK NAME STATE BANK OF INDIA BRANCH ADDRESS SECTOR-5 RANIPUR HARIDWAR BIDDER TO INDICATE BID NUMBER AND NAME OF BIDDING ENTITY IN THE TRANSACTION DETAILS FIELD AT THE TIME OF ONLINE TRANSFER. BIDDER HAS TO UPLOAD SCANNED COPY / PROOF OF THE ONLINE PAYMENT TRANSFER ALONG WITH BID.
- 14. KINDLY ARRANGE TO SUBMIT MAKE IN INDIA SELF CERTIFICATION.**
15. MSE/MII: THE SUPPLIER NEEDS TO SUBMIT/UPDATE MSE/MII CREDENTIALS ON GEM PORTAL DURING PROFILE UPDATION/ OFFER SUBMISSION STAGE. THE MSE DATA SUBMITTED IS CROSS VERIFIED BY GEM WITH GOVT. OF INDIA UDYAM/NSIC DATABASE THROUGH API INTEGRATION ON REAL TIME BASIS AND FOR MII, A SELF DECLARATION IS BEING GIVEN AND AUTHENTICATED BY AADHAR OTP. IF THE SELLER FAILS TO CLAIM MSE/MII PROVISION ON GEM PORTAL AT PROFILE UPDATION/BID SUBMISSION STAGE, THE SAID SELLER WILL BECOME INELIGIBLE FOR GETTING THE MSE/MII BENEFITS FOR THAT BID AUTOMATICALLY. THE VENDOR CAN ALWAYS CONTACT THE GEM HELPDESK, IN CASE OF ANY ISSUES.
16. THE PRICE QUOTE BY BIDDER SHOULD BE INCLUSIVE OF GST & SHOULD BE ON BHEL HEEP HARIDWAR STORES BASIS.
17. BIDDER'S OFFER IS LIABLE TO BE REJECTED IF THEY DON'T UPLOAD ANY OF THE CERTIFICATES / DOCUMENTS SOUGHT IN THE BID DOCUMENT, ATC AND CORRIGENDUM IF ANY.
18. **RISK PURCHASE:** IN CASE OF ABNORMAL DELAYS (BEYOND THE MAXIMUM LATE DELIVERY PERIOD AS PER LD CLAUSE) IN SUPPLIES / DEFECTIVE SUPPLIES OR NONFULFILLMENT OF ANY OTHER TERMS AND CONDITIONS GIVEN IN PURCHASE ORDER, BHEL MAY CANCEL THE PURCHASE ORDER IN FULL OR PART THEREOF, AND MAY ALSO MAKE THE PURCHASE OF SUCH MATERIAL FROM ELSEWHERE / ALTERNATIVE SOURCE AT THE RISK AND COST OF THE SUPPLIER. BHEL WILL TAKE ALL REASONABLE STEPS TO GET THE MATERIAL FROM ALTERNATE SOURCE AT

OPTIMUM COST. IF BIDDER DOES NOT AGREE TO THE ABOVE RISK PURCHASE CLAUSE, BHEL RESERVES THE RIGHT TO REJECT THE OFFER. IN CASE FOR COMPELLING REASONS BHEL ACCEPTS THE OFFER WITHOUT ACCEPTANCE OF THIS CLAUSE BY THE BIDDER AND IN THE EVENTUALITY OF RISK PURCHASE, APPROPRIATE ACTION WILL BE TAKEN AS PER BHEL EXTANT RULES. THIS WILL BE WITHOUT PREJUDICE TO ANY OTHER RIGHT OF BHEL UNDER THE CONTRACT OR UNDER GENERAL LAW.

19. ACTION AGAINST BIDDERS / VENDOR / SUPPLIER / CONTRACTOR IN CASE OF DEFAULT:

IN ORDER TO PROTECT THE COMMERCIAL INTERESTS OF BHEL, BHEL SHALL TAKE ACTION AGAINST SUPPLIES / CONTRACTORS BY WAY OF SUSPENSION OF BUSINESS DEALINGS, WHO EITHER FAIL TO PERFORM OR ARE IN DEFAULT WITHOUT ANY REASONABLE CAUSE, CAUSE LOSS OF BUSINESS/ MONEY/ REPUTATION, INDULGE IN MALPRACTICES, CHEATING, BRIBERY, FRAUD OR ANY OTHER MISCONDUCT OR FORMATION OF CARTELS SO AS TO INFLUENCE THE BIDDING PROCESS OR INFLUENCE THE PRICE ETC.

SUSPENSION OF BUSINESS DEALINGS COULD BE IN THE FORM OF "HOLD" OR "BANNING" A SUPPLIER/ CONTRACTOR OR A BIDDER AND SHALL BE AS PER "GUIDELINES FOR SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS/ CONTRACTORS" AVAILABLE AT BHEL'S WEBSITE <https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors>

20. BIDDERS ARE ADVISED TO CHECK APPLICABLE GST ON THEIR OWN BEFORE QUOTING. BUYER WILL NOT TAKE ANY RESPONSIBILITY IN THIS REGARDS. GST REIMBURSEMENT WILL BE AS PER ACTUALS OR AS PER APPLICABLE RATES (WHICHEVER IS LOWER), SUBJECT TO THE MAXIMUM OF QUOTED GST %.

21. BIDDER SHALL SUBMIT THE FOLLOWING DOCUMENTS ALONG WITH THEIR BID FOR VENDOR CODE CREATION:

A. COPY OF PAN CARD B. COPY OF GSTIN C. COPY OF MSE CERIFICATE

22. DEDICATED /TOLL FREE TELEPHONE NO. FOR SERVICE SUPPORT: BIDDER/OEM MUST HAVE DEDICATED/TOLL FREE TELEPHONE NO. FOR SERVICE SUPPORT.

23. DATA SHEET OF THE PRODUCT(S) OFFERED IN THE BID, ARE TO BE UPLOADED ALONG WITH THE BID DOCUMENTS. BUYERS CAN MATCH AND VERIFY THE DATA SHEET WITH THE PRODUCT SPECIFICATIONS OFFERED. IN CASE OF ANY UNEXPLAINED MISMATCH OF TECHNICAL PARAMETERS, THE BID IS LIABLE FOR REJECTION.

24. SCOPE OF SUPPLY (BID PRICE TO INCLUDE ALL COST COMPONENTS): ONLY SUPPLY OF GOODS.

25. PRODUCTS SUPPLIED SHALL BE NONTOXIC AND HARMLESS TO HEALTH. IN THE CASE OF TOXIC MATERIALS, MATERIAL SAFETY DATA SHEET MAY BE FURNISHED ALONG WITH THE MATERIAL.

26. WHILE GENERATING INVOICE IN GEM PORTAL, THE SELLER MUST UPLOAD SCANNED COPY OF GST INVOICE AND THE SCREENSHOT OF GST PORTAL CONFIRMING PAYMENT OF GST.

27. PAYMENT TERMS SHALL BE AS PER FOLLOWINGS:

a) **FOR NON-MSES BIDDER:** 100% payment along with taxes, freight & insurance will be made after receipt and acceptance of material and within 90 days from the date of invoice subject to submission of non-discrepant documents within 15 days of supply as per terms and conditions of Purchase Order (THIS IS IN SUPERSESION OF 10 DAYS' TIME AS PROVIDED IN CLAUSE 12 OF GEM GTC).

b) **FOR MSES BIDDER:** For MSEs (covered under MSME Act) which are registered and periodically renewed with BHEL, the payment will be made within 45 days or as prescribed in the relevant act. Benefits of MSE (such as EMD Waiver, Tender fee exemption, Price preference, Payment preference etc.) will be given only to those MSE Vendors who are manufacturers of offered items against the NIT. No MSE benefits shall be provided to Agents / Stockists /Dealers / Traders etc. for the items offered but not manufactured by themselves."

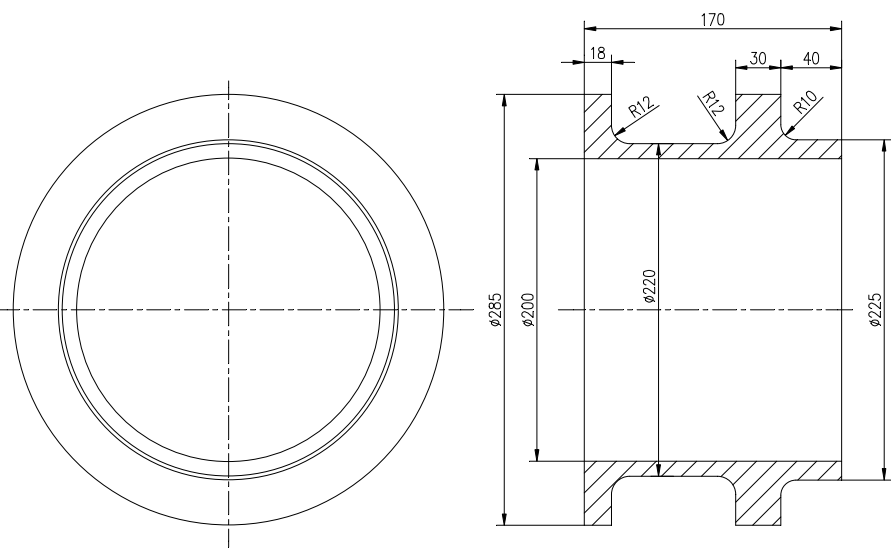
c) **FOR MEDIUM ENTERPRISES:** 100% payment along with taxes, freight & insurance will be made after receipt and acceptance of material and within 60 days from the date of invoice subject to submission of non-discrepant documents within 15 days of supply as per terms and conditions of Purchase Order.

d) Please note that vendor to adhere to the payment terms as per above. No deviation in payment terms shall be accepted. Vendor to submit their offer accordingly.

37829913130
DRAWING No.

12.5
ALL OVER

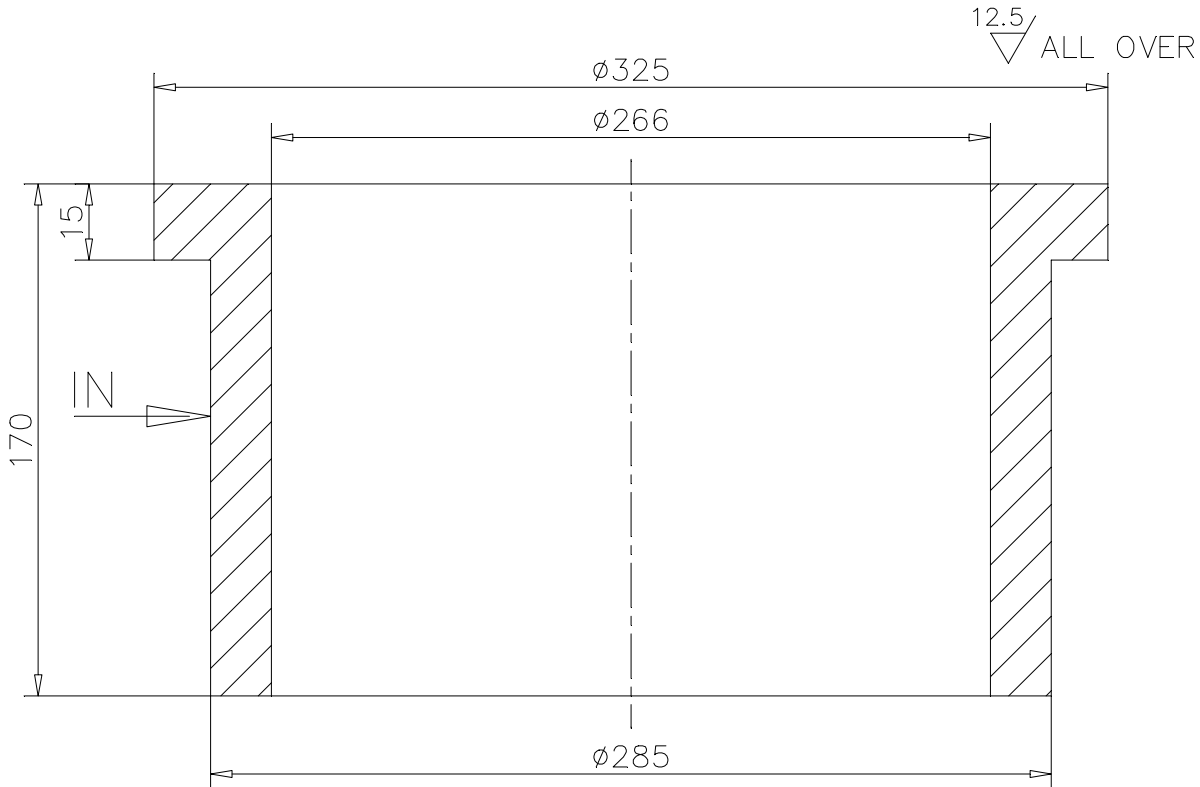
COPYRIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LTD. IT IS NOT TO BE USED, REPRODUCED OR DISSEMINATED IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



- TECHNICAL REQUIREMENTS: -
1. THE CASTING SHALL BE SUPPLIED IN ROUGH MACHINED CONDITION WITH 3±1mm. ALLOWANCE ON ALL SURFACES MARKED WITH MACHINING SYMBOL $\sqrt{12.5}$.
 2. THE CASTING SHALL BE DELIVERED TO MEET FULLY THE REQUIREMENTS AS PER ORDERING SPECIFICATION.
 3. CASTING SHALL BE SUBJECTED TO D.P. TEST AS PER AA0850131 AND ACCEPTANCE NORM SHALL BE AS PER LEVEL II OF AA0850132.
 4. DRG. NO. AND SUPPLIER'S IDENTIFICATION SHOULD BE MARKED ON THE SURFACE OF THE CASTING

1376-05-130 Ref Drawing No.	W93078205037														
	AA19936														
Sign & Date	GMS No. / C B O M / STATUS OF DRG 07820518001 / U														
	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT SRGM 76/62														
REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	DEPT	MTE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
				CHECKED				CHECKED						CHECKED	
Inventory No.	GRADE OF UNTOL. DIM M/CG.- AA0230208 m		SPE		A.K.GUPTA	-Sd-	20.06.06	Bharat Heavy Electricals Ltd. RANIPUR, HARDWAR		DRN	RAJPAL	-SD-	16.06.06	73	74
	WELDING-CLASS 'B' OF AA0621104		NCT		S.Gupta	-Sd-	21.09.06	BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR		CHD	ASHISH	-SD-	16.06.06	75	77
GAS CUTTING-TABLE 3 OF AA0621101								TITLE : CASTING FOR GUIDE BUSHING (ROUGH MACHINED)		APPD	P.K.S.	-SD-	22.09.06	22	23
								CARD CODE		DRAWING NO. 37829913130		SHEET No. 1		No. OF SHEETS 1	

REV	DATE	ALTERED	REV	DATE	ALTERED	GMS No./ C.B.O.M.- NO.		STATUS OF DRG U	
		CHECKED			CHECKED	07820518001			
ZONE			ZONE			AGREED DEPT	NAME	SIGN	DATE
						SPE	A.GUPTA	-sd-	24.06.06
						NCT	S. GUPTA	-sd-	20.09.06
GRADE OF UNTOL.DIM			M/CG. Q/M/F - AA0230208			WELDING A/B/C/D AA0621104		GAS CUTTING-T3 AA0621101	



TECHNICAL REQUIREMENTS: -

1. THE CASTING SHALL BE SUPPLIED IN ROUGH MACHINED CONDITION WITH 3 ± 1 mm. ALLOWANCE ON ALL SURFACES MARKED WITH MACHINING SYMBOL $12.5/\sqrt{\quad}$.
2. THE CASTING SHALL BE DELIVERED TO MEET FULLY THE REQUIREMENTS AS PER ORDERING SPECIFICATION.
3. CASTING SHALL BE SUBJECTED TO D.P. TEST AS PER AA0850131 AND ACCEPTANCE NORM SHALL BE AS PER LEVEL II OF AA0850132.
4. DRG. NO. AND SUPPLIER'S IDENTIFICATION SHOULD BE MARKED ON THE SURFACE OF THE CASTING

1376-05-208 Ref. Drawing No.	Sign & Date		W93078299112		NO. OF VAR -			
			AA19936					
Inventory No.	DEPT		SCALE		REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS	
	MTE		NTS					WEIGHT (KG)
	CODE 4300		NTS					
TITLE : CASTING FOR BUSH (ROUGH MACHINED)		CARD CODE		DRAWING NO.		7		
				47829913208		22 23 24		
				SHEET No. 01		No. OF SHEETS 01		



CORPORATE PURCHASING SPECIFICATION

AA19936

Rev No.04

PAGE 1 of 4

PHOSPHOR BRONZE SAND, CHILL AND CENTRIFUGAL CASTINGS GR.2

1.0 GENERAL:

This specification governs the quality requirements of Phosphor Bronze Sand Chill and Centrifugal Castings.

2.0 APPLICATION: For heavy duty bearings, bushes, gears and worm wheels.

3.0 CONDITION OF DELIVERY:

Unless otherwise specified, castings shall be supplied sand cast. Static chill cast or centrifugal chill cast shall be supplied when specified on BHEL order/drawing. Centrifugal chill castings shall be supplied in the homogenized condition as specified in Clause 8.0 below.

Castings shall not be painted.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirements of the following national standard and also meet the requirements of this specification.

IS:28-1985, Gr.2: Phosphor bronze ingots and castings

5.0 DIMENSIONS AND TOLERANCES:

The castings shall be true to the pattern/drawing.

Holes for machining up-to and including 60 mm in diameter are to be cast solid, unless otherwise stated on BHEL order/drawing

Unless otherwise specified on BHEL order/drawing, un-toleranced dimensions for the castings shall be as per Tolerance class-4 of BHEL standard AA0230402.

6.0 FINISH:

All castings shall be properly fettled, dressed and all surfaces shall be thoroughly cleaned.

7.0 FREEDOM FROM DEFECTS:

Castings shall be free from defects such as porosity, blow holes, inclusions, shrinkage, cavities, hard spots, cold shuts, cracks, etc., which may adversely affect machining and utility of castings.

Revisions:
Clause.25.1 of MOM of MRC-NFM+HE

APPROVED:
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(NFM+HE)

Rev No.04	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 st Issue
Dt:17-05-2013	Dt:	Year:	HPEP, Hyderabad	Corp.R&D	Oct 1977

AA19936

Rev. No.04

PAGE 2 of 4

CORPORATE PURCHASING SPECIFICATION



8.0 HEAT TREATMENT

Centrifugal chill castings shall be supplied in homogenised condition. Homogenisation shall be done at 550°C for about 2 hours.

9.0 CHEMICAL COMPOSITION:

The chemical composition of the material, when analysed in accordance with IS:4027 (Methods of chemical analysis for Bronzes) or by any other conventional / instrumental methods shall be as specified below:

Element	Percent	
	Minimum	Maximum
Tin	10.00	-
Phosphorus	0.50	-
*Lead	-	0.25
*Zinc	-	0.05
*Silicon	-	0.02
*Iron	-	0.10
*Aluminium	-	0.01
*Nickel	-	0.10
Total impurities	-	0.60
Copper	Remainder	

**Note: These elements need not be determined when the material supplied conforms with the mechanical properties specified in this specification. However, the supplier shall ensure that the composition of the material lies within the limits specified above.*

10.0 TEST SAMPLES:

10.1. FOR SAND AND STATIC CHILL CASTINGS:

Each heat shall be analysed for chemical composition.

Three tensile test specimens shall be poured from each heat/lot.

If any tensile test specimen shows defects on machining or reveals casting defects, it shall be discarded and replaced by another specimen.

10.2. FOR CENTRIFUGAL CHILL CASTINGS:

In the case of centrifugal chill castings, test samples requirements shall be mutually agreed upon between BHEL and the supplier.

11.0 MECHANICAL PROPERTIES:

The test samples, when tested in accordance with IS:1608 shall show the following properties:

Property	Sand Cast	Static Chill Cast	Centrifugal Chill Cast
Tensile Strength, N/mm ² (Min)	220	310	360
% Elongation on 5.65 $\sqrt{S_0}$ Gauge length (Min)	3	2	7

566-52
26/7/17



CORPORATE PURCHASING SPECIFICATION

AA19936

Rev No.04

PAGE 3 of 4

12.0 FRACTURE TEST

One sample casting shall be broken in the presence of BHEL representative in such a manner that the area of the fracture is as large as practicable in order to determine the uniformity of grain structure of the metal. If the fracture shows segregation or dross or dirt spots or any other defect, all the castings produced from the same melt shall be rejected.

13.0 ADDITIONAL TESTS:

If specified on BHEL order/drawing, the following additional tests shall be conducted on the castings.

- 1) Pressure test
- 2) Radiographic test
- 3) Any other tests

Methods of testing and norms of acceptance shall be as prescribed on BHEL order/drawing or mutually agreed upon.

14.0 RETEST:

Should any of the test pieces first selected, fail to pass the prescribed tests mentioned under various clauses in this specification, two further samples from the same batch shall be selected for testing, one of which shall be from the same casting from which the original test sample was taken, unless it has been withdrawn by the supplier.

Should the test pieces from both these additional samples pass, the batch represented by the test sample shall be accepted. Should the test pieces from either of these additional samples fail, the batch represented by the test sample shall be rejected.

15.0 INSPECTION AT SUPPLIER'S WORKS:

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

BHEL's representative shall have free access at all times while the work on the contract is being performed, to all parts of the manufacturer's works. The manufacturer shall offer BHEL's representative all reasonable facilities without charge, to satisfy the latter that the material is being furnished in accordance with this specification. The manufacturer shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities don't exist at his works, the manufacturer shall make necessary arrangements for carrying out the prescribed tests elsewhere. The manufacturer shall notify BHEL's representative in advance about the readiness of the material for inspection and testing.

CS-995 26/7/17

AA19936

Rev. No.04

PAGE 4 of 4

CORPORATE PURCHASING SPECIFICATION



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

16.0 REPAIR OF CASTINGS:

The castings shall not be repaired without prior permission of BHEL.

17.0 TEST CERTIFICATES:

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

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

The test certificate shall bear the following information:

BHEL Order No.

AA19936, Rev.04: PHOSPHOR BRONZE SAND, CHILL AND CENTRIFUGAL CASTINGS GR.2

Supplier's reference and Name

Heat No.

Drawing/ Pattern No.

Method of Manufacture

Consignment/ Identification No

Dimensional inspection

Detail of heat treatment

Results of chemical, mechanical and other tests as called for in this specification.

18.0 PACKING AND MARKING

Castings shall be suitably packed to prevent corrosion and damage during transit.

Each package or casting (when supplied separately) shall be legibly marked with the following information:

AA19936

BHEL Order No.

Consignment/Identification No.

Heat No.

Weight

Supplier's reference and Name

19.0 REFERRED STANDARDS (Latest Publications including Amendments)

- 1) AA0230402 2) IS:4027 3) IS:1608

C/112/117

CS-995



CORPORATE PURCHASING SPECIFICATION

AA 199 40

Rev. No. 02

PREFACE SHEET

TIN BRONZE SAND AND CHILL CASTINGS

**FOR INTERNAL USE ONLY
REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS**

Comparable Standards:

- 1. BRITISH : : BS EN 1982 - 1999 (Gr:CuSn 10-C)
- 2. AMERICAN : : ASTM : B 584 - 1993b ALLOY C 90500
- 3. GERMAN : : DIN 1705, Gr: G-CuSn 10

Suggested/probable Suppliers and Grades:

Refer plant vendors list.

User Plant References:

- 1. BHOPAL : PS 12060
- 2. HYDERABAD : CSN 423119.00
- 3. TRICHY : ASTM B 584-93b, AlloyC90500
- 4. HARDWAR : CSN 423119.00

Revisions :

Cl: 17.11.42 of MOM of MRC-NFCW+HE

APPROVED :

**INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)**

Rev. No. 02

Amd.No.

Reaffirmed

Prepared

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Dt: 15.11.2002

Dt :

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BHOPAL

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March, 1978

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CS-1002

	CORPORATE PURCHASING SPECIFICATION	AA 199 40
		Rev. No. 02
		PAGE 1 OF 4

TIN BRONZE SAND AND CHILL CASTINGS

1.0 GENERAL:

This specification governs the quality requirements of Tin Bronze Sand and Chill castings.

2.0 APPLICATION:

Switchgear, Controlgear, Steam Turbines Pumps and other Components"

3.0 CONDITION FO DELIVERY:

As cast or as specified in BHEL order.

Castings shall not be painted.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirement of the following national standard and also meet the requirements of this specification::

BSEN 1982-99: COPPER ALLOY INGOTS AND COPPER
Gr.CuSn 10-C : ALLOY AND HIGH CONDUCTIVITY COPPER CASTINGS

5.0 DIMENSIONS AND TOLERANCES:

The castings shall be true to this pattern/drawing. Holes unto and including 50mm in diameter are to be cast solid unless other wise stated on the order /drawing.

Unless other wise specified on the order/drawing, untoleranced dimensions for the castings shall be as per Tolerance class-4 of BHEL standard AA023 04 02

6.0 FINISH:

All castings shall be properly fettled and dressed and shall be thoroughly cleaned.

Revisions : Cl: 7.11.42 of MOM of MRC-NFC&W+HE			APPROVED : INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (NFCW+HE)		
Rev. No. 02 Dt: 15.11.2002	Amd.No. Dt :	Reaffirmed Year :	Prepared BHOPAL	Issued Corp. R&D	Dt. of 1 st Issue March, 1978

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CS-1002

AA 199 40

Rev. No. 02

PAGE 2 OF 4

CORPORATE PURCHASING SPECIFICATION

**7.0 FREEDOM FROM DEFECTS:**

The castings shall be clean and free from harmful defects such as blowholes, inclusions, shrinkage, cavities, hot spots, cold shuts, cracks etc, which may adversely affect the machining and utility of castings.

8.0 CHEMICAL COMPOSITION:

The chemical composition of the material, when analysed in accordance with IS: 4027 (Methods of chemical analysis for bronzes) or any other suitable instrumental/chemical method, shall be as follows.

Element	Percent	
	Min	Mix
Tin	9.0	11.00
*Zinc	-	0.50
*Lead	-	0.10
*Phosphorus	-	0.20
*Nickel	-	2.00
*Iron	-	0.20
*Aluminium	-	0.01
*Manganese	-	0.10
*Antimony	-	0.20
*Silicon	-	0.02
*Sulphur	-	0.05
Total impurities		0.80
Copper	Reminder	

*Note: These elements need not be determined when the material supplied conforms with the mechanical properties specified in this specification. However, the supplier shall ensure that the composition of the material lies within the limits specified above.

9.0 TEST SAMPLES:

9.1 One sample per heat shall be taken for chemical analysis.

9.2 These separately cast test bars of 30mm dia and 300 mm long per heat shall be supplied with proper identification mark to correlate with test certificate and for full testing at BHEL works. If one test piece fails two further samples from the remaining "Test Bars" shall be tested and if any one of these pass the tests, the consignment shall be accepted.



CORPORATE PURCHASING SPECIFICATION

AA 199 40

Rev. No. 02

PAGE 3 OF 4

10.0 MECHANICAL PROPERTIES:**10.1 Tensile:**

when tested in accordance with IS 1608 the material shall show the following tensile properties.

Method of casting	Tensile strength N/mm ² , min	* 0.2% Proof stress N/mm ² min	% Elongation on 5.65√S ₀ G.L. min
Sand cast	250	130	18
Static chill cast	270	160	10

* For information only.

10.2. HARDNESS (Brinell): For castings thickness of 15 to 40 mm

(For information only)

When tested in accordance with IS:1500, the castings shall show the following Brinell hardness :


Sand Cast : 70, min.
Static Chill Cast : 80, min.

11.0 ADDITIONAL:

If specified in the Purchase order /Drawing, the following additional tests shall be conducted on the castings:

1. Pressure Test
2. Radiographic Test

The methods of tests and norms of acceptance shall be as per mutual agreement between BHEL and the supplier.

AA 199 40	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 02		
PAGE 4 OF 4		

12.0 INSPECTION AT SUPPLIER'S WORKS:

Test and inspection are to be conducted in the presence of the customer's representative. The representative shall have free access at all times while the work on the contract is being performed, to all parts of the manufacturer's works. The supplier shall offer purchaser's representative all reasonable facilities, without charge, to satisfy the latter that the material is being furnished in accordance with this specification. The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works, the supplier shall make necessary arrangement for carrying out the prescribed tests elsewhere.

13.0 REPAIR OF CASTINGS:

Castings shall not be repaired, unless permission in writing has been obtained from BHEL.

14.0 TEST CERTIFICATES:

The supplier shall submit 3 copies of test certificates giving the following information. The supplier shall ensure to enclose one copy of test certificate along with their dispatch document to facilitate quick clearance.

AA 19940 (Rev No. 02) Tin Bronze Sand and Chill Castings.

BHEL Order No.

Supplier's Name

Heat No.

Drawing/Pattern No.

Consignment/Identification No.

Results of chemical analysis, mechanical and all other tests called for in this specification/order.

15.0 PACKING AND MARKING:

Castings shall be suitable packed to prevent corrosion and damage during transit. Machined surfaces shall be properly protected with anti-corrosive compounds. Each package or casting (When supplied separately) shall be legibly marked with the following information.

1. AA 19940
2. BHEL Order No.
3. Heat No
4. Identification/mark No
5. Weight
6. Supplier's reference and Name

16.0 REFERRED STANDARDS (Latest Publications Including Amendments):

1. AA0230402
2. IS 1608
3. IS 4027
4. BSEN : 1982

53-1002



CORPORATE PURCHASING SPECIFICATION

AA 199 41

Rev. No. 01

PAGE : 1 OF 4

LEADED GUNMETAL SAND CASTINGS

1.0 GENERAL :

This specification governs the requirements of leaded gunmetal sand castings.

2.0 APPLICATION :

Suitable for general casting required for fair strength, soundness, good mechinability and pressure tightens.

3.0 CONDITION OF DELIVERY :

As specified in the order/drawing.

4.0 COMPLIANCE WITH NATIONAL STANDARDS :

IS : 1458 - 1965, (Reaffirmed ¹⁹⁹⁶Gr: ~~1994~~) Class V. "Specification for Railway Bronze Ingots and castings".

5.0 DIMENSIONS AND TOLERANCES :

The dimensions of the castings shall be in accordance with the drawings supplied with the order. All surface marked for machining shall have sufficient machining allowance but it shall not be too excessive resulting in more machining. For unmachined surfaces, unless otherwise stated in the order, the tolerance on linear dimensions and wall thickness shall be as per Corporate Standard AA 023 04 02.

6.0 MANUFACTURE :

Sand Cast / Centrifugal cast, if specified on drg. or in purchase order.

7.0 FINISH :

All castings shall be properly fettled and dressed, and all surfaces shall be thoroughly cleaned.

Revisions : Cl 15.103 of MOM of 15th
MRC (NFC & W + HE)

APPROVED : Interplant
Material Rationalisation Committee-MRC
(NFC & W + HE)

Rev. No. 01

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HARDWAR

Corp. R&D

1st Oct '77

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CS-216

AA 199 41	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 01		
PAGE : 2 of 4		

8.0 FREEDOM FROM DEFECTS :

The castings shall be free from defects such as blow holes, inclusions, shrinkage cavities, hard spots, cold shuts, cracks etc., which may adversely affect the machining and utility of castings. When it is necessary to remove the risers by flame cutting, care shall be taken to make the cut at a sufficient distance from the body of the casting so as to prevent any defect being introduced into the casting due to local heating.

9.0 CHEMICAL COMPOSITION :

OR ANY OTHER CONVENTIONAL / INSTRUMENTAL METHODS

9.1 The chemical composition of the material, when analysed in accordance with IS : 4027 (Part 1 to Part 9) (Methods for Chemical analysis of bronzes) shall be as follows :

Element	Percent	
	Minimum	Maximum
*Tin	4.0	6.0
Lead	4.0	6.0
Zinc	4.0	6.0
Phosphorus	---	0.05
**Iron	—	0.3
**Antimony	---	0.3
Aluminium	---	0.01
Total of other elements Including iron and antimony	---	0.6
Copper plus incidental nickel	Remainder	

* For the purpose of utilising scrap containing a high percentage of tin, it shall be permissible to supply ingots containing tin, up to a maximum of 7.0 percent.

** Iron and antimony together shall not exceed 0.5 percent.

10.0 TEST SAMPLE :

One test specimen shall be selected from each melt for chemical analysis. Care shall be taken to discard the first drillings till a clean oxide free surface is reached :

One tensile test specimen shall be prepared from each melt/consignment.

One casting shall be taken up for fracture test from each melt/consignment.



CORPORATE PURCHASING SPECIFICATION

AA 199 41

Rev. No. 01

PAGE : 3 of 4

Pressure Test :

The number of castings to be subjected to pressure test and the corresponding criteria for conformity shall be subject to agreement between the supplier and the purchaser.

The cost of extra castings required in accordance with the sampling clauses for carrying out different tests shall be borne by the manufacturer.

11.0 MECHANICAL PROPERTIES :

The material, when tested in accordance with IS 1608 shall show the following tensile properties.

01	Mode of Casting Of Test pieces	Tensile Strength N/mm ² (Kgf/mm ²) _{Min.}	Elongation % on $5.65\sqrt{S_0}$ _{Min.}	Hardness HB (min)
	Sand cast (cast on)	185.0 (19.0)	8	60
	Sand Cast (Separately cast)	205.0 (21.0)	12	65

12.0 FRACTURE TEST :

The sample of casting shall be broken in the presence of the representative from BHEL in such a manner that the area of fracture is as large as practicable in order to determine the uniformity of the grain structure of the metal. If the fracture shows segregation or dross or dirt spots or any other defect, all castings produced from the same melt shall be rejected.

13.0 OPTIONAL TEST :

If specified in the purchase order/drawing, the following additional tests shall be conducted on the castings.


- a) Pressure test,
- b) Radiographic test.

The requirements of these tests shall be as prescribed in the order/drawing or as mutually agreed.

14.0 REPAIR OF CASTINGS :

Castings shall not be repaired unless permission in writing has been obtained previously from the BHEL.

CS-216

AA 199 41	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 01		
PAGE : 4 of 4		

15.0 Test Certificates :

The supplier shall submit five copies of test certificates giving the following information.

BHEL Order No.

CPS No. 199 41 (Rev. No. 01)

Supplier's reference and Name.

Heat No.

Results of chemical analysis mechanical and all other tests as called for in this specification/order.

Drawing/Pattern No.

Consignment/Identification No.

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

16.0 PACKING AND MARKING :

Castings shall be suitably packed to prevent corrosion and damage during transit. Machined surface shall be properly protected with anti-corrosive compounds.

Each package or casting shall be legibly marked with the following information.

BHEL Order No.

CPS No. AA 19941 Leaded gunmetal castings.

Heat No.

Identification mark/No.

Weight.

Supplier's reference and Name.

17.0 REFERRED STANDARDS (Latest Publications Including Amendments) :

1. AA 023 04 02

2. IS 1458

3. IS 1608

4. IS 4027