



**REQUIREMENT OF SAND CASTED ROUND & CENTRIFUGAL CHILL CAST**

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)	LOT NO	LOT QTY (NOS)	Delivery Schedule
1	W93078200019	DRG: 18 MM REV:00	72	1st	24	30.11.2024
2	W93078200019_1	SAND CASTED ROUND OF DIAMETER D=18MM & LENGTH L=300MM IN ROUGH MACHINED CONDITION		2nd	24	30.11.2025
3	W93078200019_2	N.STD:AA19936		3rd	24	30.11.2026
4	W93078200027	DRG: 24MM REV:00	296	1st	100	30.11.2024
5	W93078200027_1	SAND CASTED ROUND OF DIAMETER D=24MM & LENGTH=300MM IN ROUGH		2nd	100	30.11.2025
6	W93078200027_2	MACHINED CONDITION N.STD:AA19936		3rd	96	30.11.2026
7	W93078200035	DRG: 32MM REV:00	158	1st	58	30.11.2024
8	W93078200035_1	SAND CASTED ROUND OF DIAMETER D=32MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION		2nd	50	30.11.2025
9	W93078200035_2	N.STD:AA19936		3rd	50	30.11.2026
10	W93078200043	DRG: 42MM REV:00	136	1st	56	30.11.2024
11	W93078200043_1	SAND CASTED ROUND OF DIAMETER D=42MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION		2nd	40	30.11.2025
12	W93078200043_2	N.STD:AA19936		3rd	40	30.11.2026
13	W93078200051	DRG: 50MM REV:00	76	1st	26	30.11.2024
14	W93078200051_1	SAND CASTED ROUND OF DIAMETER D=50MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION		2nd	26	30.11.2025
15	W93078200051_2	N.STD:AA19936		3rd	24	30.11.2026
16	W93078200060	DRG: 60MM REV:00	88	1st	32	30.11.2024
17	W93078200060_1	SAND CASTED ROUND OF DIAMETER D=60MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION		2nd	32	30.11.2025
18	W93078200060_2	N.STD:AA19936		3rd	24	30.11.2026
19	W93078200078	DRG: 80MM REV:00	138	1st	49	30.11.2024
20	W93078200078_1	SAND CASTED ROUND OF DIAMETER D=80MM & LENGTH L=300MM IN ROUGH MACHINED CONDITION		2nd	43	30.11.2025
21	W93078200078_2	N.STD:AA19936		3rd	46	30.11.2026

22	W93078200086	DRG: 100 MM REV:00 SAND CASTED ROUND OF DIAMETER	72	1st	24	30.11.2024
23	W93078200086_1	D=100MM & LENGTH L=500MM IN ROUGH MACHINED CONDITION		2nd	24	30.11.2025
24	W93078200086_2	N.STD:AA19936		3rd	24	30.11.2026
25	W93078200094	DRG: D=130 MM REV:00 SAND CASTED ROUND OF DIAMETER	88	1st	30	30.11.2024
26	W93078200094_1	D=130MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION		2nd	30	30.11.2025
27	W93078200094_2	N.STD:AA19936		3rd	28	30.11.2026
28	W93078200108	SAND CASTED ROUND OF DIAMETER	148	1st	50	30.11.2024
29	W93078200108_1	D=45MM & LENGTH L=500MM IN ROUGH MACHINED CONDITION		2nd	50	30.11.2025
30	W93078200108_2	N.STD:AA19940 SIZE: 45MM		3rd	48	30.11.2026
31	W93078200116	CASTED & ROUGH MACHINED	50	1st	18	30.11.2024
32	W93078200116_1	ROUND OF LENGTH L=300 MM N.STD:AA19941		2nd	16	30.11.2025
33	W93078200116_2	SIZE: D = 46 DIM.: DIA		3rd	16	30.11.2026
34	W93078200124	CASTED & ROUGH MACHINED	50	1st	18	30.11.2024
35	W93078200124_1	ROUND OF LENGTH L = 300 MM N.STD:AA19941		2nd	16	30.11.2025
36	W93078200124_2	SIZE: D = 70 MM DIM.: DIA		3rd	16	30.11.2026
37	W93078200132	CASTED & ROUGH MACHINED	25	1st	10	30.11.2024
38	W93078200132_1	ROUND LENGTH= 300 MM N.STD:AA19941		2nd	8	30.11.2025
39	W93078200132_2	SIZE: D=80 DIM.: DIA		3rd	7	30.11.2026
40	W93078205037	DRG: 37829913130 REV: 00 CENTRIFUGAL CHILL CAST	34	1st	12	30.11.2024
41	W93078205037_1	'GUIDE BUSHING' ROUGH MACHINED		2nd	12	30.11.2025
42	W93078205037_2	AS PER CASTING P/N 37829913130 FOR FINISH MACHINING AS PER P/N 1376-05-130 N.STD:AA 19936		3rd	10	30.11.2026
43	W93078299112	DRG: 47829913208 REV: 00 CENTRIFUGAL CHILL CAST	30	1st	12	30.11.2024
44	W93078299112_1	'BUSHING, GUN BARREL' ROUGH MACHINED AS PER CASTING		2nd	10	30.11.2025
45	W93078299112_2	P/N 47829913208 FOR FINISH MACHINING AS PER P/N 1376-05-208 N.STD:AA 19936		3rd	8	30.11.2026

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. EARLY DELIVERY ACCEPTABLE FOR LOT 1
3. FOR LOT 2 & 3:- EARLY DELIVERY ACCEPTABLE TWO MONTHS BEFORE THE SCHEDULED DELIVERY DATE.
4. KINDLY ARRANGE TO SUBMIT TECHNO-COMMERCIAL CHECKLIST ALONG WITH YOUR OFFER.
5. VENDOR TO CONFIRM TO PROVIDE MATERIAL (CHEMICAL AND MECHANICAL PROPERTIES), FRACTURE AND DIMENSIONAL TEST CERTIFICATES OF SAND CASTED ROUND AS PER ENQUIRY CHECKLIST AND SPECIFICATION ALONG WITH SUPPLY.
6. VENDOR TO CONFIRM TO PROVIDE D.P. TEST REPORTS OF CASTING AS PER BHEL SPEC. AA0850131 & AA0850132.
7. VENDOR TO CONFIRM TO PROVIDE CERTIFICATE OF CONFORMANCE.
8. VENDOR TO CONFIRM TO PROVIDE CO-RELATION OF ALL TEST CERTIFICATES AS PER SPECIFICATION.
9. VENDOR TO CONFIRM TO PROVIDE NON REMOVEABLE IDENTIFICATION OF ITEMS AND SUBSEQUENT REPORT ACCORDINGLY.

**QUALIFYING CONDITIONS for SAND CASTED ROUNDS**

<b>Sl. no.</b>	<b>PQR Requirement</b>	<b>Action</b>	<b>Vendor Response (Yes / No)</b>
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 certified 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	

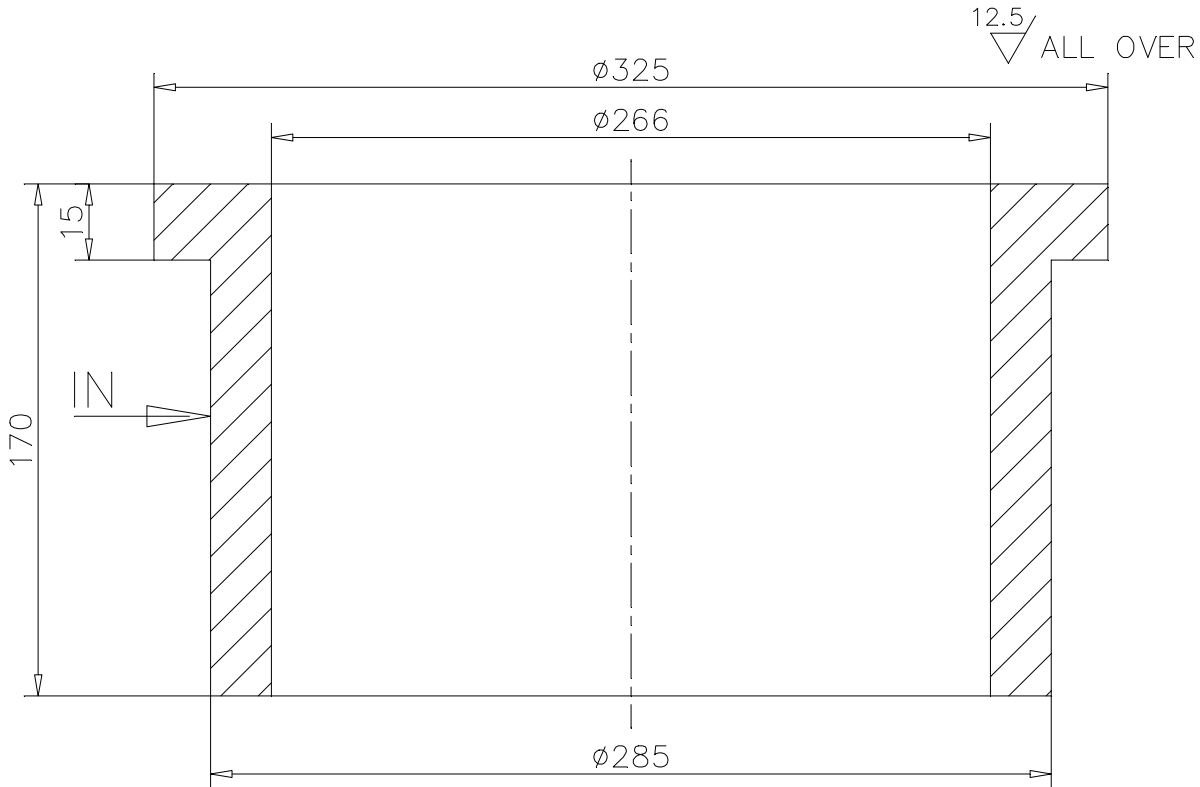
## TECHNO-COMMERCIAL CHECKLIST

SL. NO.	TERMS & CONDITION	VENDOR CONFIRMATION /REMARKS / REPLY
<b>TENDER DETAILS</b>		
1	BIDDER NAME	
2	GEM BID NO	
<b>QUALITY &amp; TECHNICAL REQUIREMENTS</b>		
3	VENDOR TO CONFIRM TO PROVIDE MATERIAL (CHEMICAL AND MECHANICAL PROPERTIES), FRACTURE AND DIMENSIONAL TEST CERTIFICATES OF SAND CASTED ROUND AS PER ENQUIRY CHECKLIST AND SPECIFICATION ALONG WITH SUPPLY	
4	VENDOR TO CONFIRM TO PROVIDE D.P. TEST REPORTS OF CASTING AS PER BHEL SPEC. AA0850131 & AA0850132	
5	VENDOR TO CONFIRM TO PROVIDE CERTIFICATE OF CONFORMANCE.	
6	VENDOR TO CONFIRM TO PROVIDE CO-RELATION OF ALL TEST CERTIFICATES AS PER SPECIFICATION.	
7	VENDOR TO CONFIRM TO PROVIDE NON REMOVEABLE IDENTIFICATION OF ITEMS AND SUBSEQUENT REPORT ACCORDINGLY	
<b>COMMERICAL REMARKS</b>		
6	VENDOR TO CONFIRM SUPPLY AS PER BELOW DELIVERY SCHEDULE: LOT 1 : 30.11.2024 LOT 2 : 30.11.2025 LOT 3 : 30.11.2026	
7	ITEM IS TO BE SUPPLIED AS PER ITEM DESCRIPTION/ SPECIFICATION/DRAWING.	
8	SUBMIT MAKE IN INDIA SELF CERTIFICATION AS PER FORMAT GIVEN ALONG WITH THE ENQUIRY	
9	KINDLY UPLOAD/ATTACH THE SPECIFICATION DETAILS/ CATALOGUE OF OFFERED ITEMS. (if applicable)	
10	ARE YOU REGISTERED UNDER MSMED ACT-2006 AS SMALL OR MICRO (UPLOAD UDYAM, WITH CA CERTIFICATE)	

10	<p><b>BREACH OF CONTRACT CLAUSE:</b>  IN CASE OF BREACH OF CONTRACT, WHEREVER THE VALUE OF SECURITY INSTRUMENTS LIKE PERFORMANCE BANK GUARANTEE AVAILABLE WITH BHEL AGAINST THE SAID CONTRACT IS ATLEAST 10% OF THE CONTRACT VALUE, THE SAME BE ENCASHED. IN CASE THE VALUE OF THE SECURITY INSTRUMENTS AVAILABLE IS LESS THAN 10% OF THE CONTRACT VALUE, THE BALANCE AMOUNT BE RECOVERED FROM OTHER FINANCIAL REMEDIES (I.E. AVAILABLE BILLS OF THE CONTRACTOR, RETENTION AMOUNT, ETC. WITH BHEL) OR LEGAL REMEDIES BE PURSUED.</p>	
11	<p><b>ACTION AGAINST BIDDERS / VENDOR / SUPPLIER / CONTRACTOR IN CASE OF DEFAULT:</b>  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 “<a href="https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors">https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors</a>”</p>	
12	REST GENERAL TERMS AND CONDITIONS AS PER GeM	


REV	DATE	ALTERED	REV	DATE	ALTERED	GMS No./ C.B.O.M.- NO. 07820518001	STATUS OF DRG U
		CHECKED			CHECKED		
ZONE			ZONE			AGREED DEPT SPE	NAME A.GUPTA
						NCT	S. GUPTA
							SIGN -sd-
							DATE 24.06.06
							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: -

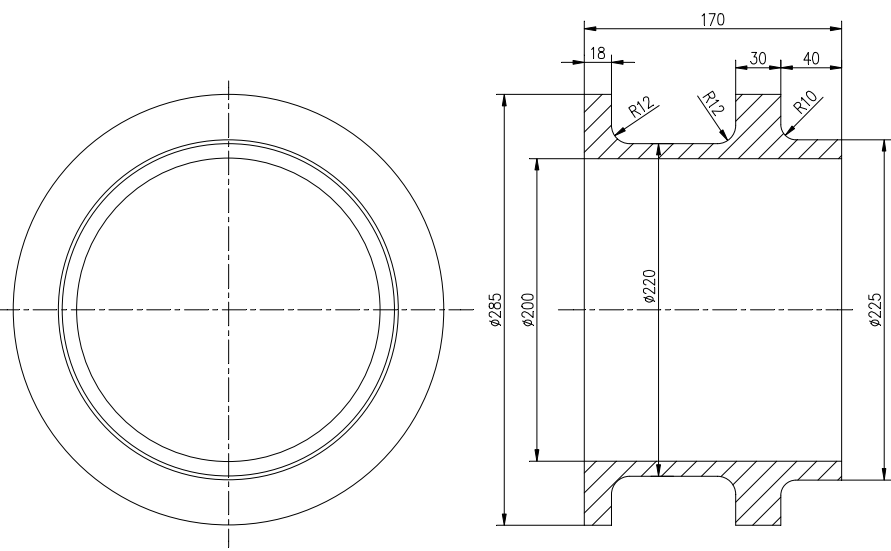
1. THE CASTING SHALL BE SUPPLIED IN ROUGH MACHINED CONDITION WITH  $3\pm 1$ mm. ALLOWANCE ON ALL SURFACES MARKED WITH MACHINING SYMBOL  $12.5/\sqrt{\quad}$ .
2. THE CASTING SHALL BE DELIVERED TO MEET FULLY THE REQUIREMENTS AS PER ORDERING SPECIFICATION.
3. CASTING SHALL BE SUBJECTED TO D.P. TEST AS PER 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		 BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR		W93078299112		NO. OF VAR -
					AA19936		
Inventory No.	DEPT	MTE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS -
	CODE	4300	NTS	24.65	17820513208	-	
	TITLE : CASTING FOR BUSH (ROUGH MACHINED)				CARD CODE	DRAWING NO. 47829913208	
					SHEET No. 01		No. OF SHEETS 01

37829913130  
DRAWING No.

12.5  
ALL OVER

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- TECHNICAL REQUIREMENTS: -**
1. THE CASTING SHALL BE SUPPLIED IN ROUGH MACHINED CONDITION WITH 3±1mm. ALLOWANCE ON ALL SURFACES MARKED WITH MACHINING SYMBOL <sup>12.5</sup>√.
  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.  
Sign & Date  
Inventory No.

W93078205037  
AA19936

GMS No. / C B O M		STATUS OF DRG	
07820518001		U	
AGREED DEPT	NAME	SIGN	DATE
SPE	A.K.GUPTA	-Sd-	20.06.06
NCT	S.Gupta	-Sd-	21.09.06

GRADE OF UNTOL. DIM  
M/CG.- AA0230208 m  
WELDING-CLASS 'B' OF AA0621104  
GAS CUTTING-TABLE 3 OF AA0621101

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		SRGM 76/62	
BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR		DRN	NAME
		CHD	SIGN
		APPD	DATE
		P.K.S.	-SD-
			16.06.06
			16.06.06
			22.09.06
DEPT	MTE	SCALE	WEIGHT (KG)
CODE	4300	1:2.5	22.15
TITLE : CASTING FOR GUIDE BUSHING (ROUGH MACHINED)		CARD CODE	REF. TO ASSY. DRG.
		7	17820513130
			ITEM No.
			22, 23, 24
		SHEET No.	No. OF SHEETS
		1	1



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## PROCEDURE FOR LIQUID PENETRANT EXAMINATION

1.0 SCOPE:

1.1 This standard details the procedure for liquid penetrant examination of non-porous ferrous and non-ferrous and non-metallic materials such as ceramics, plastics, glass, etc.

1.2 Typical surface discontinuities detectable by this method are cracks, seams, laps, cold shuts, porosity, laminations, etc.

1.3 This standard conforms substantially with ASTM E 165 — 1980 — ~~(Reapproved 1983)~~ and ASME code section V, Article 6.

2.0 PERSONNEL REQUIREMENT:

Personnel performing non-destructive examination and evaluation shall be qualified to the recommended practice SNT-TC-1A or any other recognised practice.

3.0 DESCRIPTION:

In principle a liquid penetrant is applied to the surface to be examined and allowed to enter discontinuities, excess penetrant removed, the part dried and a developer applied. The developer functions both as a blotter to absorb penetrant that has been trapped in discontinuities and as a contrasting background to enhance the visibility of penetrant indications.

4.0 APPROVED METHODS & MATERIALS:

4.1 Either a colour contrast or fluorescent penetrant method may be used. Any one of the following penetrants shall be used:

- (a) Solvent Removable
- (b) Post Emulsifying
- (c) Water Washable

4.2 For nickel base alloys and/or for stainless steel materials used in nuclear components the penetrant materials, cleaner, penetrant developer, etc., used shall not contain sulphur or halogen above 1% by weight.

4.3 Selection of liquid penetrant material shall be from the same family (brand). Inter-mixing of family of liquid penetrant materials is not allowed.

5.0 PROCEDURE:

5.1 Surface Preparation:

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Revisions:		INTERPLANT STANDARDIZATION COMMITTEE - WG (NDT)			
Cl. 7.10 of MOM of WG(NDT)		Prepared:	Issued	Date	
Rev. No. 02	Amd. No. 01	Reaffirmed	CORP. R&D	CORP. R&D	ISSUED SEP. '79
DT. NOV. '92	DT. 19.3.94	year. 1998			



- 5.1.1 Surface preparation by grinding or machining or other method may be employed where surface irregularities may mask indications of unacceptable discontinuities.
- 5.1.2 The surface to be examined and all adjacent areas within at least 25 mm shall be dry and free from any dirt, lint, scale, rust, welding flux, weld spatter, grease, bil or other extraneous matter that could obscure surface openings or otherwise interfere with examination.
- 5.1.3 The surface to be examined shall be cleaned with detergents, organic solvents, descaling solutions or paint removers. Degreasing and ultrasonic cleaning may be employed to increase cleaning efficiency. Cleaning method employed is an important part of the examination procedure. Cleaning solvents shall meet the requirements of Cl.4.2

**Caution:** Blasting with shot or dull sand, rotofinishing, buffing, wire brushing the soft material or machining with dull tools shall not be used as they may peen the discontinuities at the surface.

#### 5.2 Drying:

Drying, after cleaning the surface to be examined, shall be accomplished by normal evaporation or with forced hot air, as appropriate. A minimum period of time shall be established to ensure that the cleaning solution has evaporated prior to application of the penetrant.

#### 5.3 Application Of Penetrants:

- 5.3.1 The penetrant shall be applied by dipping, brushing or spraying. If the penetrant is applied by spraying using compressed air type apparatus, filters shall be placed at the air inlet to preclude contamination of penetrant by oil, water or dirt sediment that may have collected in the lines. Spraying should only be performed in a booth equipped with exhaust system.
- 5.3.2 The length of penetration time is critical and depends upon the material being inspected, the process through which it has passed and the type of discontinuities expected. The recommended penetration time is given in Table 1.
- 5.3.3 The temperature of the penetrant and the surface of the part to be examined shall not be below 10°C(50°F) nor above 50°C(125°F) throughout the examination period. Local heating or cooling is permitted provided the temperatures remain in the range of 10 to 50°C during the examination. Where it is not practical to comply with these temperature limitations, other temperatures and times shall be used provided the procedures are qualified as described in Annexure-I.

#### 5.4 Removal Of Excess Penetrant:

After the penetration time specified in the procedure has elapsed, any penetrant remaining on the surface shall be removed, taking care to minimise removal of penetrant from discontinuities.



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## 5.4.1 Postemulsifying Penetrants:

The emulsifier shall be applied by spraying or dipping. The emulsifying time shall not exceed 5 minutes. After emulsification, the mixture shall be removed by water spray.

## 5.4.2 Solvent Removable Penetrants:

Excess penetrant shall be removed by wiping with a cloth or absorbent paper repeating the operation until most traces of penetrants have been removed. The remaining traces shall be removed by wiping the surface lightly with cloth or absorbent paper moistened with solvent.

**Caution:** Care shall be taken to avoid excess solvent as this may remove penetrants from discontinuities. Flushing the surface with solvent following the application of the penetrant and prior to developing is prohibited.

## 5.4.3 Water Washable Penetrants:

Excess water washable penetrant shall be removed with a water spray. The water pressure shall not exceed 0.35 N/mm<sup>2</sup> (50 Psi) and the water temperature shall not exceed 43.3°C (110°F).

## 5.5 Drying:

Surface shall be dried before the application of developer.

5.5.1 a) If postemulsifying or water washable method is used, the surface shall be dried by blotting with clean materials or by using circulating warm air, provided the temperature of the surface is not raised above 50°C (125°F).

b) For solvent removable method, the surface may be dried by normal evaporation, blotting, wiping or forced air.

## 5.6 Application Of Developer:

The developer shall be applied as soon as possible after the removal of the excess penetrant. Two types of developer, dry or wet, shall be used with fluorescent penetrant. With colour contrast penetrants, only wet developer shall be used.

### 5.6.1 Application Of Dry Developer:

Dry developer shall be applied by a soft brush, a hand operated powder bulb or a powder gun or other means provided the powder is dusted evenly over the entire surface being examined.

### 5.6.2 Application Of Wet Developer

Prior to applying suspension type wet developer to the surface, the developer must be thoroughly agitated to ensure adequate dispersion of suspended particles.

(a) Aqueous Developer Application:

Aqueous developer may be applied to either a wet or dry surface. It shall be applied by dipping, spraying or other means provided a thin coating is obtained over the entire surface being examined. Drying time may be decreased by using warm air, provided the surface temperature of the part is not raised above 50°C.

(b) Non-aqueous Developer Application:

Non-aqueous developer shall be applied only on a dry surface. It shall be applied by spraying, except where safety or restricted access preclude it. Under such conditions developer may be applied by brushing. Drying shall be by normal evaporation.

6.0 EXAMINATION:

Observe the surface during the application of the developer to detect nature of any indications which tend to bleed out profusely. Final examination shall be done between 7 minutes at the earliest and 30 minutes at the latest after application of the developer. The nature of discontinuities corresponding to the indications shall be defined depending upon the method of setting, appearance, direction, shape and dimensions of the same. If the bleed out does not alter the examination results, longer periods are permitted. If the surface to be examined is large enough to preclude complete examination within the prescribed time the surface shall be examined in increments.

6.1 Colour Contrast Penetrants (Visible Dye Penetrants):

6.1.1 With colour contrast penetrants the developer forms a reasonably uniform coating. Surface discontinuities are indicated by bleeding out of the penetrant which is normally of a deep red colour. Indication with a light pink colour may indicate excessive cleaning. Inadequate cleaning may leave an excessive background making interpretation difficult.

6.1.2 Adequate illumination is required to ensure no loss of the sensitivity in the examination. Examination shall be done under natural or suitable light (illumination level shall be in the order of 500 LUX).

6.2 Fluorescent Penetrants:

Examination of the surface shall be carried out with a high intensity black light in a darkened area or booth. Black light shall have a wave length of 3650 Å°. The bulbs shall be allowed to warm up for not less than 5 minutes prior to use in the examination. The black light intensity shall be at least of 800 uW/cm<sup>2</sup> on the surface of the part being examined and the light source being kept at a distance of at least 375 mm from the surface being examined. The operator should allow his eyes to become accustomed to the darkness of the inspection booth for at least 5 minutes before inspecting the parts. He should avoid looking directly into the black light and also avoid going from the darkness to



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the light and back again **without allowing** sufficient time for his eyes to adjust to the darkness. The intensity shall be measured at least once every 8 hours and whenever the work station is changed.

**7.0 EVALUATION OF INDICATIONS & INTERPRETATION:**

- 7.1 As the developer dries to a smooth, even white coating, indications will appear at the locations of discontinuities. Depth of surface discontinuities may be correlated with the richness of colour and speed of bleeding out. However, localised surface imperfections such as may occur from machining marks or surface conditions may produce similar indications which are non-relevant.
- 7.2 Usually, a crack or similar opening will show a line and light cracks or partially welded lap will show a broken line. Gross porosity may produce large indications covering an entire area. Very fine porosity is indicated by random dots.
- 7.3 Any non-relevant indication shall be regarded as a defect until the indication is either eliminated by surface conditioning or it is Proved non-relevant by other NDT methods.
- 7.4 Linear indications are those indications in which the length is more than three times the width. Rounded indications are indications which are circular or elliptical with the length less than three times the width.
- 7.5 All indications shall be evaluated in terms of the acceptance standards of the referencing documents.

**8.0 ACCEPTANCE STANDARDS:**

- 8.1 For castings - Refer Corporate Standard AA 085 01 32 .
- 8.2 For Austenitic Forgings - Refer Corporate Standard AA 085 01 30.
- 8.3 For Welds - Refer Corporate Standard AA 085 01 29.

**9.0 POST EXAMINATION CLEANING:**

Surfaces examined shall be cleaned after evaluation of the test with dry cotton rag with or without water rinse.

**TABLE - 1 (Clause 5.3.2)**  
Suggested Penetration Time For Post-emulsified And Solvent  
Removable Penetrants

Material	Form	Type of dis-continuity	*Penetration time (min.)
Aluminium	Castings	Porosity	5
		Cold shut	5
	Extrusions & Forgings	Laps	10
		Lack of fusion	5
		Porosity	5
All forms	Cracks	10	

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**TABLE - 1 (Clause 5.3.2) Contd.**

Material	Form	Type of discontinuity	*Penetration time (min.)
Magnesium	Castings	Porosity	5
		Cold shut	5
	Extrusions & Forgings	Laps	10
	Welds	Lack of fusion	10
	All forms	Porosity	10
Steel	Castings	Cracks	10
		Porosity	10
		Cold shut	10
	Extrusions & Forgings	Laps	10
	Welds	Lack of fusion	20
Brass & Bronze	Castings	Porosity	5
		Cold shut	5
	Extrusions & Forgings	Laps	10
	Brazed parts	Lack of fusion	10
	All forms	Porosity	10
Plastics	All forms	Cracks	5
Glass	All forms	Cracks	5
Carbide tipped tools	All forms	Lack of fusion	5
		Porosity	5
		Crack	20
Titanium & high temperature alloys	All forms		20 to 30
Ceramic	All forms	Cracks	5
		Porosity	5

\* For lower temperatures, penetration time should be increased.

**ANNEXURE - 1 (Clause 5.3.3)****PROCEDURE FOR NON-STANDARD TEMPERATURES****A.1 General:**

When it is not practical to conduct a liquid penetrant examination within the temperature range of 15.6 to 51.6°C (60 to 125°F), the examination procedure at the proposed lower or higher temperature range requires qualification. This shall require the use of a quenched aluminium block, which is designated as 'Liquid Penetrant Comparator Block'.

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### A.2 Liquid Penetrant Comparator Block:

The liquid penetrant comparator block shall be **made of aluminum**, ASTM B209, Type 2024 or SB-211. Type 2024, 10 mm (3/8 in.) thick, and shall have approximate face dimensions of 50 mm x 75 mm (2 in. x 3 in.). At the centre of each face, an area approximately 25 mm in diameter shall be marked with a 510°C (950°F) temperature indicating crayon or paint. The marked area shall be heated with a blow torch, a Bunsen burner or similar device to a temperature between 510°C (950°F) and 524°C (975°F). The specimen shall then be immediately quenched in cold water which produces a network of the fine cracks on each face. The block shall then be dried by heating to approximately 149°C (300°F). After cooling, the block shall be cut into two halves. One half of the specimen shall be designated block 'A' and the other block 'B' for identification in subsequent processing. Figure 1 illustrates the comparator blocks "A" and "B". As an alternate to cutting the block in half to make blocks "A" and "B", separate blocks 50 mm x 75 mm (2 in. x 3 in.) can be made using the heating and quenching technique as described above. Two comparator blocks with closely matched crack patterns may be used. The blocks shall be marked "A" and "B".

### A.3 Comparator Application:

- (a) If it is desired to qualify a liquid penetrant examination procedure at a temperature of less than 15.6°C (60°F) the proposed procedure shall be applied to block "B" after the block and all materials have been cooled and held at the proposed examination temperature until the comparison is completed. A standard procedure which has previously been demonstrated as suitable for use shall be applied to block "A" in the 15.6 to 51.6°C (60 to 125°F) temperature range. The indications of cracks shall be compared between blocks "A" and "B". If the indications obtained under the proposed condition on block "B" are essentially the same as obtained on block "A" during examination at 15.6 to 51.6°C (60 to 125°F), the proposed procedure shall be considered qualified for use.
- (b) If the proposed temperature for the examination is above 51.6°C (125°F), block "B" shall be held at this temperature throughout the examination. The indication of cracks shall be compared as described in T-647.3(a) while block "B" is at the proposed temperature and block "A" is at the 15.6 to 51.6°C (60 to 125°F) temperature range.
- (c) A procedure qualified at a temperature lower than 15.6°C (60°F) shall be qualified from that temperature to 15.6°C (60°F).
- (d) To qualify a Procedure for temperatures above 51.6°C (125°F), the upper and lower temperature limits shall be established and the procedure qualified at these temperatures.
- (e) As an alternate to the requirements of (a) and (b) when using color contrast penetrants, it is permissible to use a single comparator block for the standard and non-standard temperatures and to make the comparison by photography.



- (f) When the single comparator block and photographic technique is used, the processing details (as applicable) described in (a) and (b) above shall apply. The block shall be thoroughly cleaned between the two processing steps. Photographs shall be taken after processing at the nonstandard temperature and then after processing at the standard temperature. The indication of cracks shall be compared between the two photographs. The same criteria for qualification as (a) above shall apply.
- (g) Identical photographic techniques shall be used to make the comparison photographs.

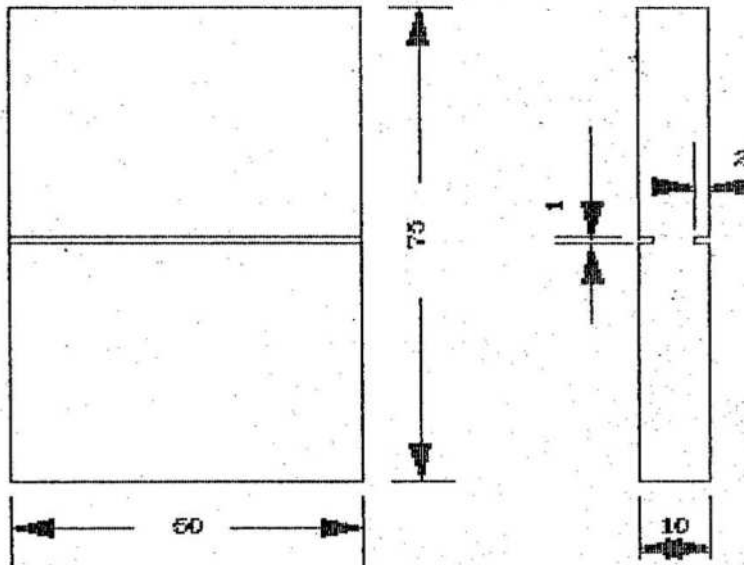


FIGURE: 1-LIQUID PENETRANT COMPARATOR BLOCK

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CS-3345	Revision			Approved : INTERPLANT NON-DESTRUCTIVE TESTING COMMITTEE		
	Rev.No. 00	Amd.No. 01	Reaffirmed	Prepared	Issued	Date
	DT.	DT. 29.10.99	year.	Corp. R&D	CORP : R & D	10 SEPT 79



# CORPORATE STANDARD

AA 085 01 32

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## 4.0 ACCEPTANCE STANDARDS:

Castings are classified into four levels, as details below, according to the size and number of flaws permissible.

01

Level	No. of acceptable indications per 100 sq. cm. surface area of length not exceeding 25cm.	Unacceptable Linear defects.
I	2 Nos. of 3mm circular indication.	Crack and hot tears.
II	3 Nos. of 3mm circular indication. One 5mm circular or linear indication.	-do-
III	3 Nos. of 3mm circular indication. 2 Nos. of 4mm circular indication. One 6mm circular or linear indication. One in-line indication of 10mm maximum length.	-do-
IV	4 Nos. of 3mm circular indication. 3 Nos. of 4mm circular indication. 2 Nos. of 8mm circular or linear indication.  One in-line indication of 15mm maximum length.	-do-

Note: The minimum permissible distance between any two or more acceptable individual flaws shall not be less than the major dimension of the larger flaw.

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11/6/80

CS-0345



# 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 <sup>st</sup> 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 <sup>2</sup> (Min)	220	310	360
% Elongation on 5.65 $\sqrt{S_0}$ Gauge length (Min)	3	2	7

566-50 26/7/17



# CORPORATE PURCHASING SPECIFICATION

AA19936

Rev No.04

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## 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.

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Rev. No.04

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## 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

CS-995 26/2/17



**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)**

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Prepared

Issued

Dt. of 1 st Issue

Dt: 15.11.2002

Dt :

Year :


BHOPAL

Corp. R&D

March, 1978

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	<p align="center"><b>CORPORATE PURCHASING SPECIFICATION</b></p>	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.

<p><b>Revisions :</b> Cl:17..11..42 of MOM of MRC-NFC&amp;W+HE</p>			<p><b>APPROVED :</b> INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (NFCW+HE)</p>		
Rev. No. 02	Amd.No.	Reaffirmed	Prepared BHOPAL	Issued Corp. R&D	Dt. of 1 st Issue March, 1978
Dt: 15.11.2002	Dt :	Year :			

CS-1002

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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

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**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 <sup>2</sup> , min	* 0.2% Proof stress N/mm <sup>2</sup> min	% Elongation on 5.65√S <sub>0</sub> 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



## 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 <sup>1996</sup> ~~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 15<sup>th</sup>  
MRC (NFC & W + HE)

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

Rev. No. 01

Amd.No. 01

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt. : 1-1-2000

Dt : 01-11-2001

Year :


HARDWAR

Corp. R&amp;D

1<sup>st</sup> Oct '77

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Rev. No. 01		
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### 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 <sup>2</sup> (Kgf/mm <sup>2</sup> ) <sub>Min.</sub>	Elongation % on $5.65\sqrt{S_0}$ <sub>Min.</sub>	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.

AA 199 41	<b>CORPORATE PURCHASING SPECIFICATION</b>	
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

**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.

**INTEGRITY PACT****Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

**and**

\_\_\_\_\_, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

**Preamble**

The Principal intends to award, under laid-down organizational procedures, contract/s for \_\_\_\_\_

\_\_\_\_\_ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

**Section 1- Commitments of the Principal**

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
  - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
  - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

**Section 2 - Commitments of the Bidder(s)/ Contractor(s)**

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.



- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

### Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process, terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

### Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above, the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

*Shutosh*

**Section 5 - Previous Transgression**

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

**Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)**

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

**Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

**Section 8 -Independent External Monitor(s)**

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.



- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

#### Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.



**Section 10 - Other Provisions**

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

*Shubh Shukla*

For & On behalf of the Principal  
(Office Seal)

Place HARIWAR

Date \_\_\_\_\_

Witness: Anam  
(Name & Address) Anam Kaushik, Hariwar

For & On behalf of the Bidder/ Contractor  
(Office Seal)

Witness: \_\_\_\_\_  
(Name & Address) \_\_\_\_\_

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. Delivery shall be as per below table:

SI. NO.	MAT CODE	ITEM DISCREPTION	Quantity (Nos)	LOT NO	LOT QTY (NOS)	Delivery Schedule
1	W93078200019	DRG: 18 MM REV:00 SAND CASTED ROUND OF DIAMETER D=18MM & LENGTH L=300MM IN ROUGH MACHINED CONDITION N.STD:AA19936	72	1st	24	30.11.2024
2	W93078200019_1			2nd	24	30.11.2025
3	W93078200019_2			3rd	24	30.11.2026
4	W93078200027	DRG: 24MM REV:00 SAND CASTED ROUND OF DIAMETER D=24MM & LENGTH=300MM IN ROUGH MACHINED CONDITION N.STD:AA19936	296	1st	100	30.11.2024
5	W93078200027_1			2nd	100	30.11.2025
6	W93078200027_2			3rd	96	30.11.2026
7	W93078200035	DRG: 32MM REV:00 SAND CASTED ROUND OF DIAMETER D=32MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N.STD:AA19936	158	1st	58	30.11.2024
8	W93078200035_1			2nd	50	30.11.2025
9	W93078200035_2			3rd	50	30.11.2026
10	W93078200043	DRG: 42MM REV:00 SAND CASTED ROUND OF DIAMETER D=42MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N.STD:AA19936	136	1st	56	30.11.2024
11	W93078200043_1			2nd	40	30.11.2025
12	W93078200043_2			3rd	40	30.11.2026
13	W93078200051	DRG: 50MM REV:00 SAND CASTED ROUND OF DIAMETER D=50MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N.STD:AA19936	76	1st	26	30.11.2024
14	W93078200051_1			2nd	26	30.11.2025
15	W93078200051_2			3rd	24	30.11.2026
16	W93078200060	DRG: 60MM REV:00 SAND CASTED ROUND OF DIAMETER D=60MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N.STD:AA19936	88	1st	32	30.11.2024
17	W93078200060_1			2nd	32	30.11.2025
18	W93078200060_2			3rd	24	30.11.2026
19	W93078200078	DRG: 80MM REV:00 SAND CASTED ROUND OF DIAMETER D=80MM & LENGTH L=300MM IN ROUGH MACHINED CONDITION N.STD:AA19936	138`	1st	49	30.11.2024
20	W93078200078_1			2nd	43	30.11.2025
21	W93078200078_2			3rd	46	30.11.2026
22	W93078200086	DRG: 100 MM REV:00 SAND CASTED ROUND OF DIAMETER D=100MM & LENGTH L=500MM IN ROUGH MACHINED CONDITION N.STD:AA19936	72	1st	24	30.11.2024
23	W93078200086_1			2nd	24	30.11.2025
24	W93078200086_2			3rd	24	30.11.2026

25	W93078200094	DRG: D=130 MM REV:00 SAND CASTED ROUND OF DIAMETER D=130MM & LENGTH L=400MM IN ROUGH MACHINED CONDITION N.STD:AA19936	88	1st	30	30.11.2024
26	W93078200094_1			2nd	30	30.11.2025
27	W93078200094_2			3rd	28	30.11.2026
28	W93078200108	SAND CASTED ROUND OF DIAMETER D=45MM & LENGTH L=500MM IN ROUGH MACHINED CONDITION N.STD:AA19940 SIZE: 45MM	148	1st	50	30.11.2024
29	W93078200108_1			2nd	50	30.11.2025
30	W93078200108_2			3rd	48	30.11.2026
31	W93078200116	CASTED & ROUGH MACHINED ROUND OF LENGTH L=300 MM N.STD:AA19941 SIZE: D = 46 DIM.: DIA	50	1st	18	30.11.2024
32	W93078200116_1			2nd	16	30.11.2025
33	W93078200116_2			3rd	16	30.11.2026
34	W93078200124	CASTED & ROUGH MACHINED ROUND OF LENGTH L = 300 MM N.STD:AA19941 SIZE: D = 70 MM DIM.: DIA	50	1st	18	30.11.2024
35	W93078200124_1			2nd	16	30.11.2025
36	W93078200124_2			3rd	16	30.11.2026
37	W93078200132	CASTED & ROUGH MACHINED ROUND LENGTH= 300 MM N.STD:AA19941 SIZE: D=80 DIM.: DIA	25	1st	10	30.11.2024
38	W93078200132_1			2nd	8	30.11.2025
39	W93078200132_2			3rd	7	30.11.2026
40	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	34	1st	12	30.11.2024
41	W93078205037_1			2nd	12	30.11.2025
42	W93078205037_2			3rd	10	30.11.2026
43	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	30	1st	12	30.11.2024
44	W93078299112_1			2nd	10	30.11.2025
45	W93078299112_2			3rd	8	30.11.2026

3. EARLY DELIVERY ACCEPTABLE FOR LOT 1
4. FOR LOT 2 & 3:- EARLY DELIVERY ACCEPTABLE TWO MONTHS BEFORE THE SCHEDULED DELIVERY DATE.
5. KINDLY ARRANGE TO SUBMIT TECHNO-COMMERCIAL CHECKLIST ALONG WITH YOUR OFFER.
6. VENDOR TO CONFIRM TO PROVIDE MATERIAL (CHEMICAL AND MECHANICAL PROPERTIES), FRACTURE AND DIMENSIONAL TEST CERTIFICATES OF SAND CASTED ROUND AS PER ENQUIRY CHECKLIST AND SPECIFICATION ALONG WITH SUPPLY.

7. VENDOR TO CONFIRM TO PROVIDE D.P. TEST REPORTS OF CASTING AS PER BHEL SPEC. AA0850131 & AA0850132.
8. VENDOR TO CONFIRM TO PROVIDE CERTIFICATE OF CONFORMANCE.
9. VENDOR TO CONFIRM TO PROVIDE CO-RELATION OF ALL TEST CERTIFICATES AS PER SPECIFICATION.
10. VENDOR TO CONFIRM TO PROVIDE NON REMOVEABLE IDENTIFICATION OF ITEMS AND SUBSEQUENT REPORT ACCORDINGLY.
11. SUBMIT MAKE IN INDIA CERTIFICATE.
12. KINDLY ARRANGE TO SUBMIT SIGNED AND STAMPED INTEGRITY PACT.
13. KINDLY MENTION THE GEM TENDER NO IN THE EMD NARRATION/REMARKS, WHILE SUBMITTED THE EMD THROUGH NEFT/RTGS.
14. VENDORS MUST ALSO REMIT THE REQUISITE **EMD (EARNEST MONEY DEPOSIT)** AS MENTIONED IN THE BID DOCUMENTS. IF EMD IS NOT SUBMITTED BY ANY VENDOR, THEN THEIR OFFER SHALL NOT BE CONSIDERED. MSes OR START-UPS AS RECOGNIZED BY DPIIT ARE EXEMPTED FROM SUBMISSION OF EMD. QUANTUM OF EMD AMOUNT TO BE SUBMITTED BY BIDDER WILL BE AS PER BELOW TABLE:

<b>EMD Amount (INR)</b>
₹ 600000

THE EMD SHALL REMAIN VALID FOR A PERIOD OF 45 (FORTY-FIVE) DAYS BEYOND THE FINAL BID VALIDITY PERIOD.

EMD SHALL NOT CARRY ANY INTEREST.

#### **FORFEITURE OF EMD**

- I) A BIDDER'S EMD WILL BE FORFEITED IF THE BIDDER WITHDRAWS OR AMENDS ITS/HIS TENDER OR IMPAIRS OR DEROGATES FROM THE TENDER IN ANY RESPECT WITHIN THE PERIOD OF VALIDITY OF THE TENDER OR IF THE SUCCESSFUL BIDDER FAILS TO FURNISH THE REQUIRED PERFORMANCE SECURITY WITHIN THE SPECIFIED PERIOD MENTIONED IN THE TENDER.
- II) EMD BY THE TENDERER TO BE WITHHELD IN CASE ANY ACTION ON THE BIDDER IS ENVISAGED UNDER THE PROVISIONS OF EXTANT "GUIDELINES ON SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS/ CONTRACTORS" AND FORFEITED/ RELEASED BASED ON THE ACTION AS DETERMINED UNDER THESE GUIDELINES.

#### **15. PERFORMANCE SECURITY:**

TO ENSURE DUE PERFORMANCE OF THE CONTRACT, PERFORMANCE BANK GUARANTEE (PBG) OR SECURITY DEPOSIT (SD), HEREAFTER REFERRED AS PERFORMANCE SECURITY IS TO BE OBTAINED FROM THE SUCCESSFUL BIDDER AWARDED THE CONTRACT.

TOTAL AMOUNT OF PERFORMANCE SECURITY SHALL BE 5 % OF TOTAL PO VALUE.

PERFORMANCE SECURITY IS TO BE FURNISHED BY 14 DAYS AFTER DATE OF PO AND IT SHOULD REMAIN VALID FOR A PERIOD OF 60 DAYS BEYOND THE DATE OF COMPLETION OF ALL CONTRACTUAL OBLIGATIONS OF THE SUPPLIER, INCLUDING WARRANTY OBLIGATIONS.

PERFORMANCE SECURITY MAY BE FURNISHED IN THE FOLLOWING FORMS:

- (I) LOCAL CHEQUES OF SCHEDULED BANKS (SUBJECT TO REALIZATION)/ PAY ORDER/DEMAND DRAFT/ ELECTRONIC FUND TRANSFER IN FAVOUR OF BHEL.
- (II) BANK GUARANTEE FROM SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT. THE BANK GUARANTEE FORMAT SHOULD HAVE THE APPROVAL OF BHEL.
- (III) FIXED DEPOSIT RECEIPT ISSUED BY SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT (FDR SHOULD BE IN THE NAME OF THE CONTRACTOR, A/C BHEL).

(IV) SECURITIES AVAILABLE FROM INDIAN POST OFFICES SUCH AS NATIONAL SAVINGS CERTIFICATES, KISAN VIKAS PATRAS ETC. (HELD IN THE NAME OF CONTRACTOR FURNISHING THE SECURITY AND DULY ENDORSED/ HYPOTHECATED/ PLEDGED, AS APPLICABLE, IN FAVOUR OF BHEL).

(V) INSURANCE SURETY BOND.

(NOTE: BHEL WILL NOT BE LIABLE OR RESPONSIBLE IN ANY MANNER FOR THE COLLECTION OF INTEREST OR RENEWAL OF THE DOCUMENTS OR IN ANY OTHER MATTER CONNECTED THEREWITH)

FOR E-PAYMENT, THE RTGS DETAILS ARE MENTIONED AS BELOW:

Bank Details	SWIFT Details of bank
STATE BANK OF INDIA RANIPUR BRANCH, OPP: BHEL MAIN GATE, SECTOR-5, RANIPUR, HARIDWAR, UTTRAKHAND, INDIA PIN CODE : 249403	SWIFT NO: SBININBB225 CC ACCOUNT NO :10667995458 IFSC CODE : SBIN0000586

THE PERFORMANCE SECURITY WILL BE FORFEITED AND CREDITED TO BHEL'S ACCOUNT IN THE EVENT OF A BREACH OF CONTRACT BY THE SUPPLIER. THE PERFORMANCE SECURITY SHALL NOT CARRY ANY INTEREST

16. 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.
17. THE PRICE QUOTE BY BIDDER SHOULD BE INCLUSIVE OF GST & SHOULD BE ON BHEL HEEP HARIDWAR STORES BASIS.
18. 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.
19. **BREACH OF CONTRACT CLAUSE:**  
IN CASE OF BREACH OF CONTRACT, WHEREVER THE VALUE OF SECURITY INSTRUMENTS LIKE PERFORMANCE BANK GUARANTEE AVAILABLE WITH BHEL AGAINST THE SAID CONTRACT IS ATLEAST 10% OF THE CONTRACT VALUE, THE SAME BE ENCASHED. IN CASE THE VALUE OF THE SECURITY INSTRUMENTS AVAILABLE IS LESS THAN 10% OF THE CONTRACT VALUE, THE BALANCE AMOUNT BE RECOVERED FROM OTHER FINANCIAL REMEDIES (I.E. AVAILABLE BILLS OF THE CONTRACTOR, RETENTION AMOUNT, ETC. WITH BHEL) OR LEGAL REMEDIES BE PURSUED.
20. **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>

21. 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 %.
22. 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
23. DEDICATED /TOLL FREE TELEPHONE NO. FOR SERVICE SUPPORT: BIDDER/OEM MUST HAVE DEDICATED/TOLL FREE TELEPHONE NO. FOR SERVICE SUPPORT.
24. 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.
25. SCOPE OF SUPPLY (BID PRICE TO INCLUDE ALL COST COMPONENTS): ONLY SUPPLY OF GOODS.
26. 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.
27. 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.
- 28. 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.