

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

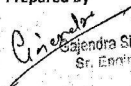
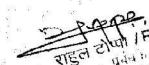
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.	REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION
	03	09.10.14	CHECKED	02	29.1.14	CHECKED	STATUS OF DRAWING
			APPD.			APPD.	
	IN BOM BP CODE OF ITEM 001 & 002 ADDED.			REF. ASSY. DRG. NO. 14454592052 WAS ON. REF. IT. NO. 003, 009 WAS 002. IN BOM IT.002 SPEC. BP12077 WAS TM97243. NOTE-3 ADDED.			DISTRIBUTION OF PRINTS TME - 1, CIM - 3 TIX - 1, TXM - 3
	REV.	DATE	ALTERED	NOTE-2 WAS ON.			
	04	17.08.24	CHECKED				
			APPD.				
SECTION-AA NOTES:- 1. REMOVE SHARP EDGES. PICKLE AND WASH. LENGTH TO BE CUT SQUARELY. 2. MATERIAL TO CONFIRM TO CATEGORY 'h₂' (HARD) OF SPEC. TM97243 WITH FOLLOWING MECHANICAL PROPERTIES FOR IT.001:- A. TENSILE STRENGTH: 300-360 N/mm² B. ELONGATION AT BREAK: 10% MIN. C. 0.2% PROOF STRESS: 250 N/mm² MIN. D. HARDNESS: 80-105 HB. 3. OXYGEN CONTENT SHOULD NOT BE MORE THAN 150 PPM FOR IT.002.							
REF. DRG. NO.	FOR IM4508AZ SEE NOTE-3		002	ROTOR BAR 8.5TKX29X480LG	BP9044721348 BP 12077	KG	1.06
	FOR IM4507BZ SEE NOTE-2		001	ROTOR BAR 8.5TKX29X420LG	BP9094721007 TM 97243	KG	0.925
SIGN. & DATE	REMARKS	ITEM NO.	DESCRIPTION	STD	MATL. CODE 46 MATL. SPCN. 54	A/C	UNIT WT. 65 QTY. 71
INVENTORY NO.					NAME	SIGN	DATE
	BHARAT HEAVY ELECTRICALS LTD. BHOPAL				DRN	SANTOSH	21.07.09
					CKD	DEEPAK	21.07.09
					APPD	K.K.D.	21.07.09
	DEPT. TME	UNTOL. DIMS. GR.	SCALE	WEIGHT(K.G.)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF
	CODE 405		N.T.S.	-	1 445 45 92 007	003, 009	ITEM
TITLE					DRAWING NO.		REV.
ROTOR BAR (IM4507BZ/IM4508AZ)					4 445 45 92 003		04
					SHT. NO. 01	NO. OF SHT. 01	

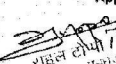
TM 97243 PAGE 01 OF 02	 PRODUCT STANDARD TME DIVISION, BHOPAL		TME/2011					
	<u>Material Specification for oxygen-free Rotor Bar</u>							
	1. General : 1.1 The material must comply with the chemical Composition, mechanical and physical properties in line with Copper UNS No C10100 as per ASTM B187 (Temper designation : Half hard – H02). 1.2 The packaging (Semi-finished product) and the dimensions as well as other delivery conditions are mentioned in the order. 2. Requirements 2.1 Chemical composition : Copper(Cu) – min 99.99% Oxygen - max 5 ppm Other impurities shall be as per ASTM B187 (UNS No. C10100) 2.2 Mechanical Properties : 1. Tensile Strength : 260 to 345 N/mm² 2. Elongation at break(A5) min : 10% 3. Rockwell Hardness(RH) : min 80 4. Electrical resistivity at 20 deg C : 0.15585 ohm g/m² 5. Temper designation : Half hard – H02 2.3 Further Requirements 2.3.1 The material shall be supplied in finished condition as per drawing/order. 2.3.2 The test shall be conducted as per ASTM B187. 2.3.3 1% of the offered quantity to be subjected to radiography/Ultrasonic test from any independent government/NABL approved laboratory and report shall be provided by vendor to BHEL.							
Revision: 05 Date: 28-10-2022	Distribution TXM TME	Qty. 1 1	Approved : <i>(Signature)</i> 28/10/22 (Vikas Rawtiya) <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;"> Prepared <i>(Signature)</i> 28.10.22 Ashish Tiwari </td> <td style="width: 50%; text-align: center;"> Checked <i>(Signature)</i> 28.10.22 Kunja Dugvekar </td> </tr> <tr> <td colspan="2" style="text-align: right;"> Date: 28-10-2022 </td> </tr> </table>		Prepared <i>(Signature)</i> 28.10.22 Ashish Tiwari	Checked <i>(Signature)</i> 28.10.22 Kunja Dugvekar	Date: 28-10-2022	
Prepared <i>(Signature)</i> 28.10.22 Ashish Tiwari	Checked <i>(Signature)</i> 28.10.22 Kunja Dugvekar							
Date: 28-10-2022								

		 PRODUCT STANDARD TME DIVISION, BHOPAL TME/2011	TM 97243 PAGE 02 OF 02
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly or indirectly in any way detrimental to the interest of the company		2.4 Packing The individual shipments are to be packed so that no damage can arise during transport. 2.5 Transport The shipment is to be made by rail or road transport in such a way that it can be unloaded easily. 2.6 Identification The material shall be labeled securely and indelibly(e.g. with an adhesive label on an appendage) with the following information. 1. The name of the manufacturer, purchase order reference and date. 2. Item, size, quantity, batch no, date of manufacturing by indicating MM/YY. 3. Special precaution for storage, if applicable for the material. 3.0 Test Method for Rotor bar 3.1 Chemical composition : Raw material for rotor bar should be as per ASTM B187, UNS No C10100 , Half hard – H02. 3.2 Tensile strength, Elongation at break, Rockwell Hardness, Electrical resistivity. 1. Tensile strength and elongation should be tested as per IS:1608 Part 1. 2. Mass resistivity should be derived from the test results as per IS:613. 3. The hardness should be measured in Rockwell hardness scale HRF. (If required conversion to other hardness scale to be done using ASTM E140-12B) 3.3 Dimensional Test : All dimensions will have to be checked as per drawing dimension.	

	BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL QUALITY ASSURANCE PLAN FOR ROTOR BAR TO BHEL ORDERING SPECIFICATION/DRAWING AS PER PO
	QUALITY PLAN NO. – QAP/QTM/VENDOR QAP/2022-23/ROTOR BAR DTD REV 00 DTD 20.12.2022 Reference Document- PO DRAWING/SPECIFICATION
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SL. NO	COMPONENT	CHARACTERISTICS	TYPE OF CHECK	QUANTAM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	INSPECTION AGENCY	REMARKS
				TP	TP/A					
1)	Raw material	a) Chemical properties b) Mechanical properties c) oxygen content d) Temper condition (102)	TC verification	100% (VR)	100% (VR)	As per specification	As per specification	MTC	BHEL/TP/A	RAW MATERIAL TC to be co related to finished material and to be verified by TP/A
2)	Dimension	Dimension	Measurement	20%	5% (w)	As per drawing & specification	As per drawing & Specification	Supplier record	BHEL/TP/A	100 % TC verified by TP/A and 5 % TC Witnessed by TP/A to be submitted
3)	Visual check	Free from any piping, crow feet, indentations, foreign particles or inclusion, surface defect. Twists & entanglements	Visual	100%	5% (w)	As per drawing & specification	As per drawing & specification	Supplier record	BHEL/TP/A	

Prepared By  Ajendra Singh Rathour Sr. Engineer Quality Control BHEL, Bhopal	Approved By  RAHUL TOPPO Manager QTM / QTM Division BHEL, Bhopal
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 BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL QUALITY ASSURANCE PLAN FOR ROTOR BAR TO BHEL ORDERING SPECIFICATION/DRAWING AS PER PO QUALITY PLAN NO. - QAP/QTM/VENDOR QAP/2022-23/ROTOR BAR DTD REV 00 DTD 20.12.2022 Reference Document- PO DRAWING/SPECIFICATION										
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4)	Testing on finished bar	Chemical properties	Testing	one sample per lot At NABL lab	RR	As per specification	As per specification	Supplier record	BHEL/TPIA	NABL LAB tested TC to be verified and correlated by TPIA and submitted to BHEL. If Testing not done at NABL lab then same shall be witnessed by TPIA at vendor works.
		Mechanical properties	Testing	one sample per lot At NABL lab	RR	As per specification	As per specification	Supplier record	BHEL/TPIA	
		Electrical properties	Testing	One sample per lot at NABL LAB & 100 % by supplier	100 % RR & 1% witness	As per specification	As per specification	Supplier record	BHEL/TPIA	
		NDT testing: 2) ultrasonic testing/eddy current testing (only if mentioned in drawing/specification.)	Testing	1 % per lot at NABL lab OR government approved LEVEL II operator at vendor works	1% witness	As per specification	As per specification	Supplier record	BHEL/TPIA	
Prepared By		 Sajendra Singh Rathour Sr. Engineer (Quality Control)				Approved By  RAHUL TOPPO Manager / QTM Division अथर्व प्रमाण / QTM Division अ.प्र.प्र. & प्र.प्र. भोपाल / BHEL, Bhopal				



BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
QUALITY ASSURANCE PLAN FOR ROTOR BAR TO BHEL ORDERING SPECIFICATION/DRAWING AS PER PO

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 Reference Document- PO DRAWING/SPECIFICATION

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5)	Identification vendor name, PO & job serial no.	Visual	Visual	100%	10% witness	As per drawing & specification	As per drawing & Specification	Supplier record	BHEL/TPJA	Witness
6)	Packing to avoid transit damage	Visual	Visual	100%	20%	As per drawing & specification	As per drawing & specification	Packing list for each kit box	BHEL/TPJA	Packing to be such that no damages should occur during transit. 1 kit items should be placed in on 1 box

Prepared By

Gajendra Singh Rathore

Gajendra Singh Rathore
 Sr. Engineer (QC)
 Quality Control
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Approved By

Rajendra Singh

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