



BHARAT HEAVY ELECTRICALS LIMITED
HEEP HARIDWAR INDIA-PIN 249403
FAX NO: 0091 1334 226462
PHONE NO: 0091 1334 284142

BHEL ENQUIRY No: T/3990/20/1029K1

M/s.....

Sub: BHEL-HEEP/OPEN-TENDER (Turbine) / 2021

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 and so on.

The tender is invited on **the E-Procurement Portal** (<https://eprocurebhel.co.in/nicgep/app>) from the manufacturers (registered as well as unregistered) for the item **BAR MATERIAL FOR TURBINE BLADES NICR20TIAL (NIMONIC 80 A)** as per details mentioned in **Annexure (Item Details)**. The Offer shall be submitted on the E- Procurement portal only.

SPECIAL INSTRUCTIONS OF ENQUIRY-

1. Late delivery Penalty for Late Deliveries shall be applicable @0.5% per week or part thereof on the value of respective delayed supplies subject to maximum of 10% of the value of respective delayed supplies. If vendor do not confirm late delivery penalty clause in their offer, then it shall be presumed to be acceptable. No further clarification shall be asked in this regard after opening of techno-commercial bid part-1.
2. Vendor to confirm, endorse and return back enclosed BHEL QP "QA/CF/QP/358, rev01".
3. Inspection by BHEL nominated inspection agency "BVIL" as per BHEL approved Quality Plan.
4. All vendors to provide point wise reply/confirmation along with relevant supporting documents to each and every point of Annexure (Pre-Qualification Requirement/PQR) for all enquiry items. Non-compliance of these may lead to rejection of offer as these are essential condition for participating in tender enquiry.
5. Vendor to offer best delivery schedule. Delivery is not sacrosanct.
6. The evaluation currency for this tender shall be INR.
7. End of bars should be squared and sawed off properly.
8. There should be proper stamping of cross section, Heat number, material grade, vendor code/vendor name on each bar at the pitch of one meter.
9. Quantity tolerance should be (+/-10)%.
10. **Price bid shall be opened of customer approved vendors only.**
11. Vendor Contract clause regarding GST ITC and provision for E-Invoices w.e.f. 01.10.2020:
 - (i) W.e.f. 01.01.2021, vendor to ensure submission of E-Invoice who is having turnover of more than Rs. 100 Crs. in any preceding financial year from 2017-18 onwards.

- (ii) It has been specified by the Govt. that it is mandatory to mention a valid unique invoice Reference No. (IRN) and QR code as generated from Govt. portal on a Tax Invoice. Based on such information, GST ITC as claimed by BHEL in GST Returns shall be matched with the corresponding details uploaded by supplier in E-Invoicing System.
- (iii) In case the vendor /contractor delays or fails to provide all the documents as per the Purchase order / Work Order at the time of submitting Tax invoice to BHEL, any subsequent financial loss to BHEL on account of vendor/contractor shall be to vendor's / contractor's account. BHEL has further right to take necessary steps to protect its interest at the time of release of payment. This further requires inclusion of IRN and QR code on tax invoice as announced by Govt. of India w.e.f. 01.10.2020.
12. For this tender, only Class-I and Class-II Local suppliers as per MII order dated 04.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. Bid of non-local suppliers (if any) shall be out rightly rejected.
13. Procurement directly from Manufacturers/ suppliers shall be preferred. However, in case of submission of offer through agents including dealers/ traders/ distributors/ stockiest/ Channel partners etc. on behalf of manufacturer or the manufacturer themselves insists for making suppliers through their such agents only, following guidelines will be followed.
- a. Either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both.
 - b. In case bids are received from both the manufacturer / supplier and the agent, the bid received from agent shall be ignored.
 - c. The agent shall not allow to represent more than one manufacturer / supplier in the same tender.
 - d. Agent should submit the authorization letter from the manufacturer clearly indicating details like Name, e-mail and address of manufacturer and relationship with agent and its validity to be submitted with bid. The authorization letter should be tender specific.
 - e. In case order is to be placed and executed by agent following aspects are to be ensured:
 - Manufacturer of the agent should meet the PQR as defined in tender.
 - Agent should have annual turnover of at least equal to Rs. 125 Lacs during one financial year and the net worth of the agent should be positive.
 - Manufacturer and bidder / agent should jointly confirm Guarantee for the quality of product and timely delivery as stipulated in the NIT.
14. Please submit your offer only for the above requirement subject to our **GENERAL INSTRUCTIONS AND STANDARD TERMS & CONDITIONS (GISTC: Version December-2020, Rev: 05)**. Please visit our site www.hwr.bhel.com for General Instructions and Standard Terms & Conditions (GISTC) for Tender Enquiries. All the bidders/vendors must ensure compliance of these GISTC. GISTC can also be referred by login to B2B Portal for Registered Vendors.

The tender documents can be downloaded from the web sites <https://eprocurebhel.co.in/nicgep/app> / www.bhel.com / www.hwr.bhel.com.

Vendors must also remit the requisite EMD (Earnest Money Deposit) of Rs. 2,00,000/- (Rupees Two lakh only) in the form of Pay Order/ E-payment / Demand draft (drawn in favor of 'BHEL HARIDWAR'). **If EMD is not submitted along with the offer (Part-I) then the offer shall be out rightly rejected.**

"As per the OM No. F.No. 1(2)(1)/2016-MA dtd. 09.02.2017 issued from the Office of Development Commissioner (Micro, Small & Medium Enterprises), "Traders and agents should not be allowed to avail the benefits extended under the PP Policy."

In view of this, it is clarified that 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.”

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

As per notification reference no. NSIC/HO/GP/15(4)/2013-14 dated 07.07.2013 Micro & Small Enterprises (MSEs) are not required to submit Tender fees. A Valid MSE certificate such as Udyog Aadhar (UAN)/Udyam Certificate/NSIC/EM (Part-II) as per GISTC shall be submitted in support of Micro & Small Enterprises (MSEs).

Central / State – PSUs / Government departments are exempted from submission of EMD subject to approval by BHEL management.

BHEL will forfeit the EMD if, the successful bidder / vendor refuses to honor the order after award of the same on him and / or withdraws his bid and / or unilaterally changes the offer and / or any of its terms & conditions within the validity period.

INSTRUCTIONS TO BIDDERS FOR SUBMITTING OFFER

DEFINITION

Registered Vendors - Are those who are registered with BHEL, Haridwar for Megawatt rating/ Size/ Weight of tendered components in respective steel grade or machining of such items.

Un-registered Vendors - Are those who are not registered with BHEL, Haridwar for Megawatt rating/ Size/ Weight of tendered components in respective steel grade or machining of such items.

TECHNICAL QUALIFICATION: Technical Requirement, Pre-Qualifying Requirements/PQR & Drawings to be submitted. It is the mandatory requirement. Offer of vendors not meeting these requirements may not be considered.

ESSENTIAL INSTRUCTIONS

Un-registered vendors may be approved by BHEL, if found suitable, on the basis of data furnished by them in Supplier Registration Form (SRF) for Foreign Vendors or Indigenous Vendors (as applicable). Vendor Registration Form shall be filled only by unregistered vendors on our website www.bhel.com.

BHEL team may visit the vendor(s) works for verification of capability and capacity claimed in tender documents/offer(s).

The tender shall be **submitted in three parts** in separate cover as described below on or before the due date:

Part I (Cover-1) - Containing the following:

1. Pre-Qualifying Requirements/PQR as per **Annexure (PQR)**
2. EMD (Earnest Money Deposit) **Or** Valid certificate/Document towards exemption of Tender fee and/or EMD (applicable for Micro and small Enterprises, Central / State – PSUs / Government departments, PMD vendors etc.)

Part II (Cover-2) - Containing the following

1. Techno -Commercial Bid
2. Techno-commercial terms and conditions as per **Annexure (Techno-commercial terms and conditions)**
3. **Annexure** (Self-Certification Certificate (MII))
4. **Annexure** (Certificate required as per order no F.No.6/18/2019-PPD of department of Expenditure(DoE))
5. **Annexure** (Signed BHEL QP 'QA/CF/QP/358, rev01')

Part III (Cover-3) - Containing the following

1. Price Bid as per attached Annexure (Price Bid Format)

Salient Details of Notice Inviting Tender (NIT)		
Sl. No.	Issue	Description
1.	Item details	As per Annexure- Item details
2.	Issue of Tender Documents	From BHEL eProcurement website https://eprocurebhel.co.in/nicgep/app (Tender documents will be available for downloading from BHEL e-Procurement website till due date of submission)
3.	Due Date Of Offer Submission	Date: 17.02.2021 Time: 13:45 hrs https://eprocurebhel.co.in/nicgep/app Offer to be submitted in online only through e-procurement Portal. (Bidders are requested to visit website to view corrigendum/ addenda/ amendments/ extension/ modification etc. before submitting offer).

4.	Opening of Tender	Date: 17.02.2021 Time: 14.00 Hrs <i>Notes:</i> <i>This tender being an e-tender, it shall be opened online only through the E-Procurement Portal. Participating bidders may witness the Opening online only.</i>
5.	Contact details of BHEL	Vardhman Jain : jainv@bhel.in Mohit Kumar : mohit.kumar@bhel.in Ravi Shankar Kumar : rskumar@bhel.in
6.	Latest Updates	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL e-procurement portal https://eprocurebhel.co.in/nicgep/app and not in the newspapers. Bidders to keep themselves updated with all such information

E-Procurement Portal Inputs

Procedure for Submission of Offer for E – Tender-Procedure for Submission of Tender is available in the “Bidder Manual for BHEL Bidders” at E-tender portal <https://eprocurebhel.co.in/nicgep/app> . Terms and conditions mentioned therein shall form integral part of the NIT and bidders shall abide by the same.

Hardware and Software requirements for participating in e-tender

Please refer the website for the minimum system requirements and setting document for Bidders under the link: <https://eprocurebhel.co.in/nicgep/app>

Digital Signature

To know the procedure for obtaining Digital Signature Certificate (DSC), suppliers who are not having the DSC are advised to visit our website [http://www.bhel.com/home.php/Tender Notifications/Sample Checklist](http://www.bhel.com/home.php/Tender%20Notifications/Sample%20Checklist).

NIC portal Helpdesk Contacts

For any technical related queries please call at 24 x 7 Help Desk Number

0120-4001 002

0120-4200 462

0120-4001 005

0120-6277 787

International bidders are requested to prefix 91 as country code

Email Support

Address: A) For any Issues or Clarifications relating to the published tenders, bidders are requested to contact the respective Tender Inviting Authority

Technical - support-eproc@nic.in

Note

Offers/tenders submitted in the E-Procurement Portal (<https://eprocurebhel.co.in/nicgep/app>) shall only be considered for further evaluation. Offers sent by FAX / E-mail / any mode other than E-Procurement Portal would not be entertained and shall be outrightly rejected.

SPECIAL NOTE: All documents to be submitted should be uploaded in respective places in the E-Procurement portal as per the list mentioned given in this NIT. BHEL shall not be responsible for incomplete documents.

NIC ENQUIRY DETAIL

SNO	ENQNO	MATCODE	MDESC	QUANTITY	UNIT	Delivery Required
1	T/3990/20/1029K1	HW1270384015	BAR MATERIAL FOR TURBINE BLADES NICR20TIAL(NIMONIC 80A) SPEC: HW12784 REV: 03 SIZE: 64X29 DIM.: WXT	1137	kg	30.09.2021
2		HW1270384023	BAR MATERIAL FOR TURBINE BLADE S NICR20TIAL(NIMONIC 80 A) SPEC: HW12784 REV: 03 SIZE: 60X26 DIM.: WXT	580	kg	30.09.2021
3		HW1270384031	BAR MATERIAL FOR TURBINE BLADE S NICR20TIAL(NIMONIC 80 A) SPEC: HW12784 REV: 03 SIZE: 62X28 DIM.: WXT	597	kg	30.09.2021

Specification: HW12784, Rev 03, HW0993008 and all cross referred standards

Minimum Qualification Requirement for blade flats of material grade NiCr20TiAl, HW12784 Rev 03

1.0 Experience Requirement:

a. Vendor must satisfy following requirements:

- (i) Must have experience of manufacturing and supplying rectangular bars in material grade NiCr20TiAl, (material number 2.4952) or other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc.
Must have manufactured and executed at least one purchase order of flat bars of NiCr20TiAl or other precipitation hardened Nickel based alloys e.g Alloy 105, Alloy 115 etc. in the last 5 years.

In support of above vendor to submit experience details in enquired grade preferably in format given below:

Sl. No	Name of customer	Purchase order No	Size	Date of supply	Quantity

b. Following documents are to be submitted in support of experience:

- Test certificate duly witnessed/certified by Third party inspection agency / customer of above referred purchase order. Test certificates shall include - chemical & mechanical properties, heat treatment details and dimensions.
- c. Vendor must have creep rupture data of NiCr20TiAl as per the requirement of EN/AMS/ASTM etc. In support, vendor has to submit Creep Rupture Data for flat or round bars or forgings etc., of NiCr20TiAl.

2.0 Manufacturing and Testing Facilities:

a. **Vendor to confirm** that they have in house rolling/forging and heat treatment facility to manufacture rectangular bars as per enquiry specification HW12784 and enquiry dimensions and tolerances as per HW0993008.

Following in house facility details are to be submitted:

- Rolling/forging
- Heat treatment facility

b. Vendor to furnish details of in house melting and refining facilities to manufacture raw material for further rolling/forging for turbine blade flats as per enquiry specification. At least one test certificate for material grade NiCr20TiAl manufactured in house to be submitted with offer.

In case, melting & refining facility is not available in house, vendor to inform their source of raw material with following details of their source – Experience for enquiry material grade with at least one mill test certificate of enquiry material grade, melting & refining facilities.

c. Vendor to confirm that they have in house testing facilities as per the requirement of enquiry specification. Details of in house facility to be submitted.

In case of outsourcing of any test, vendor to agree to carry out testing at Government accredited labs only.

3.0 Supply length is 2.5 meter to 5 meter with 10% short down to 1 meter as per Specification no HW0993008. In case vendor wants to offer in shorter lengths wrt this specification, supply in shorter lengths will be acceptable only as cut pieces of fixed length. *"For example bars of say 70x30mm will have to be supplied in fixed lengths of 230 mm."* BHEL will inform exact lengths for each cross section, in case of offer of lengths shorter than specified, by vendor.

MANUFACTURER'S NAME AND ADDRESS				STANDARD QUALITY PLAN				TO BE FILLED BY BHEL				TO BE FILLED BY BHEL			
VENDOR'S NAME		ITEM		BAR MATERIAL FOR TURBINE BLADES		QP NO.	REV.	QA/CF/QP/358							
BHEL		DRG. NO.		-		HW12784		AS PER PO		Page 1 of 2					
SL. NO.		COMPONENT & OPERATIONS		CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY		REMARKS	
1		2		3		4	5	6	7	8	9	D	M	B	N

1.	VACUUM INDUCTION MELTING	CHEMICAL COMPOSITION	MAJOR	SPECTRO ANALYSIS	EACH HEAT	HW12784	HW12784	TC	P	V					
2.	ELECTRO SLAG REMELTING (ESR) OR VACUUM ARC REMELTING (VAR) ROLLING / FORGING	CHEMICAL COMPOSITION	MAJOR	SPECTRO ANALYSIS	EACH HEAT	HW12784	HW12784	TC	P	V					
3.						AS PER VENDOR'S PRACTICE		IR	P	-					
4.	HEAT TREATMENT	TIME & TEMPERATURE	MAJOR	HT CHART	100%	HW12784	HW12784	TC	P	V					
5.	STRAIGHTENING	STRAIGHTNESS	MAJOR	STARIGHTNESS	100%	HW12784 & AS PER VENDOR'S PRACTICE		TC	P	V					TO BE PERFORMED IF REQUIRED
6.	HARDNESS TEST	HARDNESS	MAJOR	HARDNESS	10% PER HEAT PER HT BATCH OR MIN 10 BARS WHICHEVER IS MAXIMUM	HW12784	HW12784	TC	P	W					
7.	MECHANICAL TESTING	0.2% PROOF STRENGTH TENSILE % ELONGATION % REDUCTION IN AREA IMPACT	MAJOR	MECHANICAL TEST	HARDEST AND SOFTEST BAR PER HEAT PER HT BATCH	HW12784	HW12784	TC	P	W					

MANUFACTURER/SUBCONTRACTOR		FOR CUSTOMER USE	
LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL NOM. INSPECTION AGENCY "TUV" (INDIAN VENDORS) N: CUSTOMER THIRD PARTY INSPECTION AGENCY LRS/TUB/BV (FOR FOREIGN VENDORS) INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY	

ANNEXURE - 3
N/11-A

MANUFACTURER'S NAME AND ADDRESS				STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL		
BHEL		VENDOR'S NAME		ITEM	BAR MATERIAL FOR TURBINE BLADES		OP NO.	QA/CF/QP/358				
SL. NO.		COMPONENT & OPERATIONS		CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY	REMARKS
1		2		3	4	5	6	7	8	9	10	11
				DRG. NO.	-		HW12784					
				SPEC.	HW12784							
				REV	AS PER PO							
				Page 2 of 2								

8.	METALLOGRAPHIC EXAMINATION IN CORNER AND IN CENTER POSITION	CREEP RUPTURE TEST	MAJOR	CREEP	AS PER SPEC	HW12784	HW12784	TC	P	V	
		GRAIN SIZE / MICROSTRUCTURE	MAJOR	METALLOGRAPHIC	HARDEST AND SOFTTEST BAR PER HEAT PER HT BATCH	HW12784	HW12784	TC	P	V	
9.	PROCESS QUALIFICATION FOR EACH FABRICATION FACILITY (FOR FIRST TIME SUPPLY)										
9.1	MECHANICAL TESTING IN EDGE POSITION	0.2% PROOF STRENGTH TENSILE % ELONGATION % REDUCTION IN AREA IMPACT HARDNESS	MAJOR	MECHANICAL TEST	AS PER SPEC	HW12784	HW12784	TC	P	W	
9.2	METALLOGRAPHIC EXAMINATION IN LONGITUDINAL DIRECTION	MICROSTRUCTURE & GRAIN SIZE	MAJOR	METALLOGRAPHIC	AS PER SPEC	HW12784	HW12784	TC	P	V	
10.	NDT	SURFACE DEFECTS INTERNAL DEFECTS	MAJOR	VISUAL DP, UT	100%	HW12784	HW12784	TC	P	W	
11.	MATERIAL IDENTIFICATION / VERIFICATION / CHECK	CHEMICAL	MAJOR	SPECTRO	100%	HW12784	HW12784	TC	P	W	
12.	VISUAL & DIMENSIONAL CHECK	VISUAL & DIMENSION	MAJOR	VISUAL & MEASURE	100%	PURCHASE ORDER	PURCHASE ORDER	TC	P	W	*10% RANDOM
13.	IDENTIFICATION MARKING	MARKING	MAJOR	VISUAL	100%	HW12784	HW12784	TC	P	V	

MANUFACTURER/SUBCO		LEGEND:		FOR CUSTOMER USE	
Digitally signed by NOKIA Date: 2020.10.28 14:58:05 +05'30'		I RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL NOM. INSPECTION AGENCY "TUV" (INDIAN VENDORS) N: CUSTOMER THIRD PARTY INSPECTION AGENCY LRS/TUB/BV (FOR FOREIGN VENDORS) INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY	

ON COMPANY LETTER HEAD

Date -

CERTIFICATE REQUIRED AS PER RULE 144(XI) OF GENERAL FINANCIAL RULES (GFRS) 2017

To,
M/s Bharat Heavy Electricals Ltd.
Heavy Electrical Equipment Plant
Haridwar – 249403

Ref:

Tender No. –

I have read the clauses regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that bidder (.....) is not from such a country or, if from such a country, has been registered with the competent authority. I hereby certify that bidder (.....) fulfils all requirements in this regard and is eligible to be considered. (Where applicable, evidence of valid registration by the competent authority shall be attached).

Authorized Signatory
(Name of signatory with company seal)

Self-certification

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

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(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.

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Details of location at which local value addition will be made is as follows: -

.....

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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.

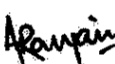
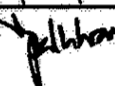
Seal & Signature of Supplier

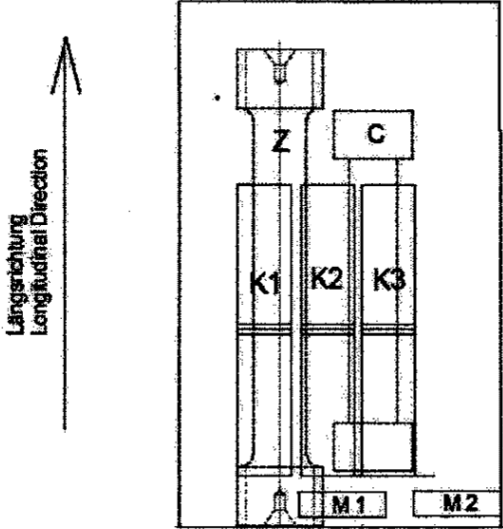
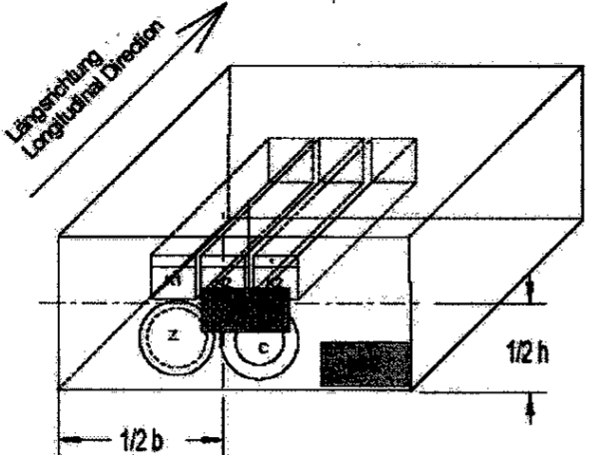
हस्ताक्षर एवं दिनांक SIGN & DATE		 संस्थान क्रय विनिर्देश (हीप - हरिद्वार)	HW 12784 पृष्ठ का Page 1 of 7	
समग्री सूची संख्या INVENTORY NO.	हस्ताक्षर एवं दिनांक SIGN & DATE	PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)		
समग्री सूची संख्या INVENTORY NO. TLV9520.10	हस्ताक्षर एवं दिनांक SIGN & DATE 07/2008	BAR MATERIAL FOR TURBINE BLADES, NiCr20TiAl		
1.0 GENERAL: The specification governs the quality of bars, rolled or forged for milled turbine blades in grade NiCr20TiAl (Material No. 2.4952). 2.0 APPLICATION: Bars are required for blades used for turbine and compressor 3.0 CONDITION OF DELIVERY Bars shall be supplied in hot rolled or forged and milled, heat treated condition. The bars should be straight and free from waviness. 4.0 DIMENSION AND TOLERANCES: Dimension tolerance, straightness, twisting and bulging limits shall be as per HW0993008. 5.0 GENERAL REQUIREMENTS: The manufacturer must demonstrate that it has implemented a quality system that meets the requirements stipulated in EN ISO 9000. The stipulations of the present purchasing specification apply for all the manufacturers' production shops, as well as their sub-suppliers. If the material is delivered for the first time, a process qualification according to clause 12.0 "Process qualification" must be performed. Separate process qualification is required for each facility of the manufacturer. Before starting the production, the manufacturer shall provide BHEL a manufacturing and inspection sequence plan (MIP) for information after the successful process qualification. The MIP establishes the quality assured sequence of operations. Information on internal and external specifications is also given to BHEL in MIP. BHEL may view the manufacturer's internal MIP if he wishes to do so. The manufacturer has to inform BHEL about every change in the manufacturing or subcontractor process or inspection process. BHEL decides if a new qualification process is necessary. Subcontracting of any manufacturing steps is permissible only with BHEL written approval. Also manufacturer shall submit test instructions for non-destructive and destructive testing which are performed as part of his own quality assurance measures. The test instructions shall include precise information on the tests, illustrated by sketch. If necessary. General hints on other specification are not sufficient. 6.0 MANUFACTURING 6.1 Melting The alloy shall be made by vacuum induction melting / electro-slag re-melting (VIM/ESR) or by vacuum induction melting / vacuum arc re-melting (VIM / VAR) process.				
हस्ताक्षर एवं दिनांक SIGN & DATE		हस्ताक्षर एवं दिनांक SIGNATURE & DATE		
PSC		NAME		
TSX		TRANSLATED BY		
QAX		WORKED BY		
STE-TB		CHECKED BY		
सहमत विभाग AGREED DEPTT.		SUPERVISED BY		
नाम NAME		Gr. No		
दिनांक एवं हस्ताक्षर DATE & SIGNATURE		2.60		
REV NO. DI. CHANGE ADVICE NO.		स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE		
		निर्माण PREPARED : MTE		
		जारी : मानक विभाग ISSUED : STANDARDS DIVISION		
		दिनांक DATE : 01.06.1993		

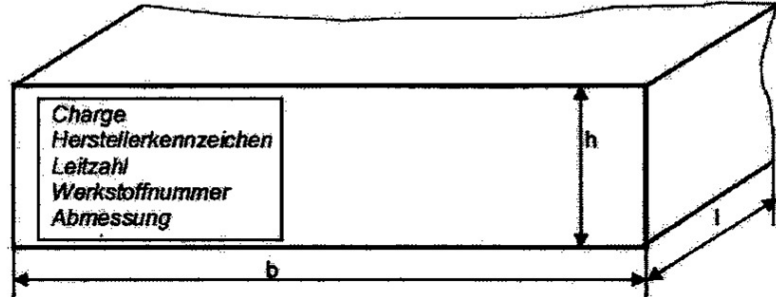
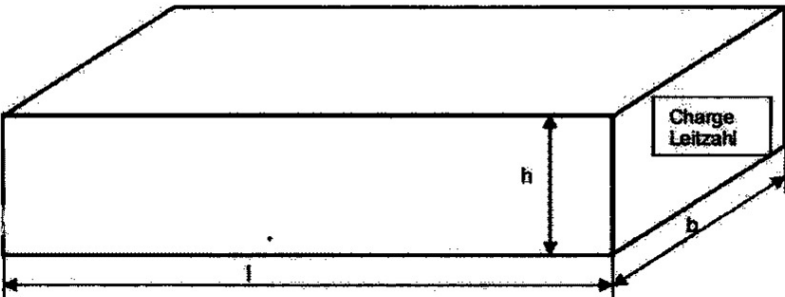
निर्माण एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)	HW 12784																															
			पृष्ठ का Page 2 of 7																															
SUPPERSEDES INVENTORY NO. शासी सूची संख्या को अधिकारित करना है	6.2 Ingot Discard: Sufficient discard shall be made from each ingot to ensure freedom from piping, injurious segregation and other imperfections.																																	
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	6.3 Forging: The ingot conversion shall be conducted in such a manner as to produce substantially uniform structure throughout the forged bar. The manufacturing process of the bars can be rolling or forging.																																	
	6.4 Heat Treatment: The forging shall be heat treated to get desired mechanical properties as per clause 7.2.1.																																	
	Solution treatment : 8 h at 1050 - 1080°C, Air cooling Stabilizing: 24 h at 845°C (± 10°C), Air cooling Precipitation hardening: 16 h at 700°C (± 10°C), Air cooling The forming process and the solution treatment shall be chosen in such a way that over the whole cross section a homogeneous microstructure with a grain size of 3 to 6 according to ASTM E 122 will be reached. (See also 7.2.2)																																	
	7.0 PROPERTIES AND TESTS: 7.1 Chemical Composition: Heat analysis in weight % (according to EN 10269 table 1) shall be as follows:																																	
	<table border="1"> <tr> <td>C</td> <td>0.04 - 0.10</td> <td>Si</td> <td>≤ 0.30</td> <td>Mn</td> <td>≤ 1.00</td> </tr> <tr> <td>P</td> <td>≤ 0.010</td> <td>S</td> <td>≤ 0.010</td> <td>Cr</td> <td>18.0 - 21.0</td> </tr> <tr> <td>Ti</td> <td>1.80 - 2.70</td> <td>Ni</td> <td>Rest</td> <td>Co</td> <td>≤ 1.00</td> </tr> <tr> <td>Fe</td> <td>≤ 1.50</td> <td>Al</td> <td>1.0 - 1.8</td> <td>B</td> <td>≤ 0.008</td> </tr> <tr> <td>Cu</td> <td>≤ 0.20</td> <td>Ti + Al</td> <td>≥ 3.50</td> <td></td> <td></td> </tr> </table>				C	0.04 - 0.10	Si	≤ 0.30	Mn	≤ 1.00	P	≤ 0.010	S	≤ 0.010	Cr	18.0 - 21.0	Ti	1.80 - 2.70	Ni	Rest	Co	≤ 1.00	Fe	≤ 1.50	Al	1.0 - 1.8	B	≤ 0.008	Cu	≤ 0.20	Ti + Al	≥ 3.50		
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स्वसाधिकाए एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आगमना काय से किसी भी तरह प्रयोग, जो कि कंपनी के हित में सुविधाकारक हो न किया जाए।	7.2 Position of test pieces: Specimen extraction is performed as per attachment 1. The specimens are to be taken in longitudinal direction. The positions of the specimens given in the attachment are meant to serve only as an example. Details concerning the locations of specimens, both at bar material and at bar material made of semi finished parts, are to be agreed upon by BHEL and must be given in the MIP, including a sketch of the specimen location.																																	
	7.2.1 Mechanical Properties: It shall be ensured that the required mechanical properties are achieved throughout the entire bar cross section. The uniformity of the strength of the bars of a given delivery (per melt and heat treatment batch = test unit) shall be verified by a hardness test per EN ISO 6506-1. HBW 10/3000 or HBW 5/750 shall be used. Any other hardness test method shall be subject to prior agreement with BHEL. The hardness test shall be performed on 10% of each test unit, however on at least 10 bars, or if the test unit comprises less than 10 bars on every bar. Mechanical properties shall be determined on the hardest and softest bar indentified by this test. Tensile testing shall be conducted according to EN 10002 resp. ASTM E8M (preferred round tension test specimen with $L_0 = 50$ mm and $d_0 = 10$ mm) or ASTM E8 (Standard specimen per fig. 8). Impact testing shall be performed with standard test pieces with V-notch according to EN 10045. The following properties must be demonstrated at room temperature by the following tests:																																	
निर्माण एवं SIGN & DATE 24/9/11	REV 03	निर्माणकर्ता WORKED BY Ashish Ranjan	20.9.11	20.9.11																														
शासी सूची संख्या INVENTORY NO. P-4101		जाँचकर्ता CHECKED BY Gopal Krishnan																																

दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (डीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)	HW 12784 पृष्ठ का Page 3 of 7												
सुपरसेड्स INVENTORY NO. सामग्री सूची संख्या को प्रतिबिम्बित करना है	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 16.6%;">0.2% proof Strength N/mm²</th> <th style="width: 16.6%;">Tensile Strength N/mm²</th> <th style="width: 16.6%;">Elongation (Lo=5d) (%)</th> <th style="width: 16.6%;">Reduction in area (%)</th> <th style="width: 16.6%;">Impact Energy (J)</th> <th style="width: 16.6%;">Hardness HBW</th> </tr> <tr> <td style="text-align: center;">≥ 600</td> <td style="text-align: center;">1000 - 1300</td> <td style="text-align: center;">≥ 17</td> <td style="text-align: center;">≥ 17</td> <td style="text-align: center;">≥ 20 ¹⁾</td> <td style="text-align: center;">≥ 260</td> </tr> </table>			0.2% proof Strength N/mm ²	Tensile Strength N/mm ²	Elongation (Lo=5d) (%)	Reduction in area (%)	Impact Energy (J)	Hardness HBW	≥ 600	1000 - 1300	≥ 17	≥ 17	≥ 20 ¹⁾	≥ 260
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≥ 600	1000 - 1300	≥ 17	≥ 17	≥ 20 ¹⁾	≥ 260										
COPYRIGHT AND CONFIDENTIAL This information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	¹⁾ Average of 3 Charpy V-notch specimens. In addition a short time creep rupture test according to DIN EN 10291 or other agreed standard has to be carried out, using the following parameters: Test temperature: T = 750°C Proof stress σ_p = 310 MPa The following values have to be reached: Creep rupture time t_m ≥ 100 h Elongation A_u ≥ 4 % Reduction of area Z_u ≥ 4 % If no creep rupture is occurred after 100 h, the proof stress can be increased for further 30 MPa after every 24 h, until the creep rupture occurred. 7.2.2 Grain Size Check: The metallographic examination has to be carried out at the beginning and at the end of the hardest and softest bar and in each case in the corner and in the center of the cross section. A substantially homogeneous microstructure with a grain size 3 -6 according to ASTM E 112 has to be achieved in the cross section. A grain size DUPLEX ALA 3 according to ASTM E 930 is acceptable provided, that a grain size of 1 is not exceeded. A deviating microstructure has to be documented according to ASTM E 1181 and to be approved by the BHEL. Reduction of amount of testing can be agreed with the BHEL. For this purpose the manufacturer has to provide adequate results. 7.2.3 Outer and Inner Quality / NDE: 7.2.3.1 Scope of Inspection: Following NDE shall be performed in delivery condition: • Visual inspection of all bars • verification test of all bars • Complete ultrasonic inspection (UT) of all bars according to EN 10308 type 1a (table 1) or other agreed standard (e.g. AMS STD 2154) has to be carried out. The calibration block and the reference block have to be manufactured out of materials with similar acoustic properties and similar surface conditions. The test has to be performed only by employees with level 2 certified according to EN 473 or SNT-TC-1A. • 100% PT of all bars without the face areas according to EN 571-1. It is permitted to carry out a UT with a double transducer probe in the near surface area instead of PT.														
स्वतंत्रतापूर्व एवं गोपनीय इस प्रलेख में की गई सूचना भारत की स्वतंत्रतापूर्व की, स्वतंत्रता के बाद की है। इसका प्रयोग एवं अनावरण केवल उसी व्यक्ति के द्वारा ही किया जा सकता है जो कि इस सूचना को प्राप्त करने के लिए अधिकृत है।	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"> दिनांक DATE 24/9/11 </td> <td style="width: 10%;"> हस्ताक्षर एवं SIGN & DATE 24/9/11 </td> <td style="width: 40%;"> REV 03 </td> <td style="width: 40%;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">निर्माणाकर्ता WORKED BY</td> <td style="width: 20%;">Ashish Ranjan</td> <td style="width: 20%;">ARanjan</td> <td style="width: 40%;">20.09.11</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>Gopal Krishnan</td> <td>Gopal</td> <td>20.9.11</td> </tr> </table> </td> </tr> </table>			दिनांक DATE 24/9/11	हस्ताक्षर एवं SIGN & DATE 24/9/11	REV 03	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">निर्माणाकर्ता WORKED BY</td> <td style="width: 20%;">Ashish Ranjan</td> <td style="width: 20%;">ARanjan</td> <td style="width: 40%;">20.09.11</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>Gopal Krishnan</td> <td>Gopal</td> <td>20.9.11</td> </tr> </table>	निर्माणाकर्ता WORKED BY	Ashish Ranjan	ARanjan	20.09.11	जांचकर्ता CHECKED BY	Gopal Krishnan	Gopal	20.9.11
दिनांक DATE 24/9/11	हस्ताक्षर एवं SIGN & DATE 24/9/11	REV 03	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">निर्माणाकर्ता WORKED BY</td> <td style="width: 20%;">Ashish Ranjan</td> <td style="width: 20%;">ARanjan</td> <td style="width: 40%;">20.09.11</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>Gopal Krishnan</td> <td>Gopal</td> <td>20.9.11</td> </tr> </table>	निर्माणाकर्ता WORKED BY	Ashish Ranjan	ARanjan	20.09.11	जांचकर्ता CHECKED BY	Gopal Krishnan	Gopal	20.9.11				
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सामग्री सूची संख्या INVENTORY NO. P-4101															

निर्माण एवं परीक्षण SIGN & DATE			संस्थान क्रय विनिर्देश (डीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)		HW 12784 पृष्ठ का Page 4 of 7	
SUPERSEDES INVENTORY NO. सामग्री पुरानी संख्या को अधिस्थापित करता है		7.2.3.2 Criteria for registration and decision: a) Regarding UT inspection quality class 3 according to EN10308 (table 3) shall be applied. The decision limit for loss of back wall echo is 3 dB for all bar dimensions. The recording level is defined with $> 1\text{mm } d_{eq}$. All indication $d_{eq} \leq 1\text{mm}$ are acceptable. b) PT: Indications $\geq 5\text{ mm}$ are unacceptable. Indications-free grinding excavations with depths $\leq 1\text{mm}$ are acceptable.				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bhabha Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		8.0 MARKING: Blades are to be marked as per attachment 2 and specification AA0400310. 9.0 DOCUMENTATION: The supplier shall supply four copies of the test certificate 3.1 as per EN10204 unless and otherwise stated on the order. The test certificate shall bear the following information: • Order no. • Specification no. / Material Designation • Heat Number, heat analysis and melting method • Complete information of all heat treatments performed • Results of mechanical testing, including a list with all measured hardness • Photos of microstructure with results of the grain size determination & creep test report • Results of non destructive testing • Confirmation of the material identification check • Confirmation of the dimensional and visual check				
		10.0 CLEARANCE FOR DELIVERY: The total results of the tests / checks carried out are the deciding factor for clearance for delivery, and hence shall be intimated to BHEL in advance. In case of nonconformance, BHEL evaluates the total results taking into consideration intended use of the material and examines accordingly the acceptability of deviation (if any). No material shall be delivered, if deviated, without acceptance by BHEL. The clearance, however, does not relieve the supplier of his responsibility for the hidden / unreported non-permissible defects which are found later. 11.0 DEVIATIONS: Deviations from this Purchase Specification, which arise during manufacturing, may be submitted to BHEL in writing, giving full details of the deviation. Acceptance of concession request will be at the sole discretion of BHEL. 12.0 PROCESS QUALIFICATION: A qualification review, performed jointly by the BHEL and supplier, is required before starting production for the first order. This initial process qualification is required for each fabrication facility of the manufacturer. The fabrication and inspection parameters stipulated during this phase form the basis of the manufacturing and inspection sequence plan (MIP) which the supplier prepares at his own responsibility. Manufacturing is commenced after the check of conformity by the purchaser and depends on the results of the qualification review, If necessary; the manufacturing parameters are to be further optimized. Unless otherwise stipulated by the purchaser, the process qualification shall also be required for the first three orders in addition. If desired, a process qualification can also be called for as verification of the reliability of fabrication.				
स्वतंत्रताधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत देश की सुरक्षाविवेक की रक्षा के लिए गोपनीय है। इसका प्रयोग केवल भारत सरकार के अधिकारियों द्वारा ही किया जा सकता है। अन्यथा इसका प्रयोग करने वाले को कानून की सजा भुगानी होगी।						
निर्माण एवं परीक्षण SIGN & DATE 24/9/11		REV 03				
सामग्री पुरानी संख्या INVENTORY NO. P-4101			निर्माणकर्ता WORKED BY	Ashish Ranjan	20.9.11	
			जांचकर्ता CHECKED BY	Gopal Krishnan	20.9.11	

निर्माण एवं स्थापना SIGN & DATE			संस्थान क्रय विनिर्देश (हीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)		HW 12784 पृष्ठ का Page 5 of 7	
सुपरसेड्स INVENTORY NO.		In addition to the scope of testing and examination given in section 7.0 the following tests shall performed (also on the hardest and softest bar): • Mechanical tests also in the edge position of the cross section • Photos of the microstructure with results of the grain size determination in longitudinal direction All results shall be given in a detailed report to BHEL.				
कॉपीराइट और कॉन्फिडेंशियल 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.		13.0 CROSS REFERRED STANDARDS: EN ISO 9000, ASTM E122, EN 10269, EN ISO 6506-1, EN 10002, ASTM E8M, EN 10045, DIN EN 10291, ASTM E930, ASTM E1181, EN 10308, EN 473, EN 571-1, EN10204				
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आवरण के बिना किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।						
निर्माण एवं स्थापना SIGN & DATE	24/9/11					
सामग्री सूची संख्या INVENTORY NO. P-4101	REV 	निर्माणकर्ता WORKED BY Ashish Ranjan	जांचकर्ता CHECKED BY Gopal Krishnan	 	20.09.11 20.9.11	

निर्माण एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (डीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)	HW 12784 पृष्ठ का Page 6 of 7	
सुपरसेड्स INVENTORY NO. सामग्री पूर्ण संख्या को अधिकारिक करना है	Attachment 1			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	STANDARD TESTING Make sure that all specimens are located in the middle of material.			
स्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आसपास काय से किसी भी तरह प्रयोग, उसे कि अपनी को किए में हानिकारक हो न किया जाए।	 Z: Tensile Specimen C: Creep test specimen K1- K3: Charpy impact specimen M1: Micro specimen (Cross Section) M2: Micro specimen (Cross Section) 			
हस्ताक्षर एवं तिथि SIGN & DATE 24/9/11	REV 03			
सामग्री पूर्ण संख्या INVENTORY NO. P- 4101	निर्माणकर्ता WORKED BY Ashish Ranjan	जांचकर्ता CHECKED BY Gopal Krishnan	20.09.11 20.9.11	20.09.11

विनिर्देशक एवं प्रमाणित SIGN & DATE			संस्थान क्रय विनिर्देश (डीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARIDWAR)		HW 12784 पृष्ठ का Page 7 of 7	
सुपरसेडिंग SUPERSEDES INVENTORY NO.		Attachment#2				
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.		Marking for Steel for Steam Turbine Blades <u>Following details are to be marked on the blades:</u> Heat No. Manufacturer Name / Reference Purchase order No. Material No. Dimensions The identification marking shall be applied as follows: <u>In Case of bars:</u> Marking of each individual bar at the front with details mentioned above.				
						
		In case of cut pieces (cut bars, rhomboids); with stamped figures, ink stamp or stickers/labels 				
		h = Dicke, thickness l = Länge, length b = Breite, width				
विनिर्देशक एवं प्रमाणित SIGN & DATE	24/9/11	REV 03		निर्माणकर्ता WORKED BY	Ashish Ranjan	20.09.11
सामग्री पुरी संख्या INVENTORY NO.	P-4101		जांचकर्ता CHECKED BY	Gopal Krishnan	20.9.11	

पृष्ठ डीजी ४१(डी) FORM DG 41(D)

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CHANGE ADVICE NO.

(1)

जारीकर्ता विभाग
ISSUING DEPTT.

(2)

उत्पाद का प्रकार
TYPE OF PRODUCT

(3)

जोड़कर/जोड़ा
रसम/सीबीएस सं
GMS / GRSP
/CBOM No.

(4)

मुद्रण विवरण
PRINT
DELIVERY DATE

(5)

स्वीकृतिकर्ता
APPROVED BY

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संशोधन का विवरण
DETAILS OF REVISIONअभिलेख
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No. etc)संशोधित
पृष्ठ
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REVISED
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संशोधन
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REV. NO.

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OF CHANGE

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जोड़ा है
AS IT EXISTS

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REVIEW

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CODES FOR REASON OF CHANGES: 01- ENGINEERING ERROR INCLUDING D.O. ERRORS, 02- DESIGN UPGRADATION (INCLUDING ADDITION OF VARIANTS), 03- DESIGN REVIEW INCLUDING CHANGES DUE TO CHANGE ADVICE IN OTHER DOCUMENTS, 04- TO MEET MANUFACTURING REQUIREMENTS, 05- TO MEET TECHNOLOGICAL MODIFICATIONS, 06- TO SUIT CUSTOMER DEMANDS, 07- TO SUIT STATUTORY REQUIREMENTS, 08- TO REPLACE DAMAGED, 09- TURN OUT ORIGINALS BY A FRESH ORIGINALS, 09- ANY OTHER

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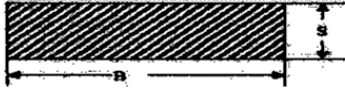
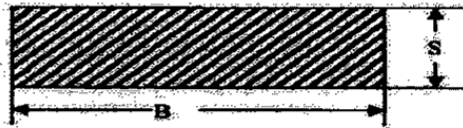
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SIGN & DATE SUPERSEDES INVENTORY NO. संपूर्ण सूची संख्या को प्रतिस्थापित करना है		संस्थान मानक (हीप : हरिद्वार) PLANT STANDARD (HEEP: HARIDWAR)	HW0993008 पृष्ठ 2 का 1 Page 1 of 2																
(OWN EXPERIENCE)																			
DIMENSION AND TOLERANCES OF BAR MATERIAL OF BLADES FOR SPECIFICATIONS HW10663, HW10670, HW10786, HW10687 & NICKEL BASED SUPER ALLOYS (HW12784, INCONEL 617M, NIMONIC 105 ETC.)																			
1. Dimension & Tolerances: The dimension shall be as per purchase order. Unless otherwise stated in the purchase order, length or bars shall be 2.5- 5 meters with maximum 10% short down to 1 meter. Tolerance on thickness and width are as follows:																			
																			
Table: 1.1 FOR HW10663, HW10670, HW10786, HW10687 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>B, width across flats (mm)</th> <th>Max Allowable deviation on B, mm</th> <th>S, Thickness (mm)</th> <th>Max Allowable deviation on S, mm</th> </tr> </thead> <tbody> <tr> <td>$B \leq 35$</td> <td>+1.5</td> <td>$S \leq 20$</td> <td>+1</td> </tr> <tr> <td>$35 < B \leq 75$</td> <td>+2</td> <td>$20 < S \leq 40$</td> <td>+2</td> </tr> <tr> <td>$B > 75$</td> <td>+3</td> <td>$S > 40$</td> <td>+3</td> </tr> </tbody> </table>				B, width across flats (mm)	Max Allowable deviation on B, mm	S, Thickness (mm)	Max Allowable deviation on S, mm	$B \leq 35$	+1.5	$S \leq 20$	+1	$35 < B \leq 75$	+2	$20 < S \leq 40$	+2	$B > 75$	+3	$S > 40$	+3
B, width across flats (mm)	Max Allowable deviation on B, mm	S, Thickness (mm)	Max Allowable deviation on S, mm																
$B \leq 35$	+1.5	$S \leq 20$	+1																
$35 < B \leq 75$	+2	$20 < S \leq 40$	+2																
$B > 75$	+3	$S > 40$	+3																
Table: 1.2 FOR HW12784 (NIMONIC 80A), INCONEL 617M, NIMONIC 105 ETC. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>B, width across flats (mm)</th> <th>Max Allowable deviation on B, mm</th> <th>S, Thickness (mm)</th> <th>Max Allowable deviation on S, mm</th> </tr> </thead> <tbody> <tr> <td>$B \leq 75$</td> <td>+1</td> <td>$S \leq 40$</td> <td>+1</td> </tr> <tr> <td>$B > 75$</td> <td>+1.5</td> <td>$S > 40$</td> <td>+1.5</td> </tr> </tbody> </table>				B, width across flats (mm)	Max Allowable deviation on B, mm	S, Thickness (mm)	Max Allowable deviation on S, mm	$B \leq 75$	+1	$S \leq 40$	+1	$B > 75$	+1.5	$S > 40$	+1.5				
B, width across flats (mm)	Max Allowable deviation on B, mm	S, Thickness (mm)	Max Allowable deviation on S, mm																
$B \leq 75$	+1	$S \leq 40$	+1																
$B > 75$	+1.5	$S > 40$	+1.5																
Twisting and bending will be allowed as per following table:2																			
																			
SIGN & DATE SUPERSEDES INVENTORY NO. संपूर्ण सूची संख्या को प्रतिस्थापित करना है	MTE TSX STE-TB QAX सहमत विभाग AGREED DEPTT.	ASHISH Sandeep Gupta R.K. Singh U.K. Pandey नाम NAME DATE & SIGNATURE	राजिव कुमार राजक RAJIV KUMAR RAJAK संतानु भोवमिक SANTANU BHOWMIK नाम NAME DATE & SIGNATURE																
		स्वीकृत संस्थान मानकीकरण समिति APPROVED : PLANT STANDARDIZATION COMMITTEE	निर्माण : टी.बी.एम PREPARED : TBM																
		जारी : टी.स.एक्स ISSUED : TSX	दिनांक DATE : 03.06.2020																
		रिवीज नंबर REV.NO. 01	ग्र. नं. Gr. NO. 6.4																
		ड्राइंग नंबर DL 03/6/2020	चेंज एडिसन नंबर CHANGE ADVICE NO. TSX/TBM/20-166																



संस्थान मानक (हीप : हरिद्वार)

HW0993008

PLANT STANDARD (HEEP : HARIDWAR)

पृष्ठ 2 का 2
Page 2 of 2

Table:2

Condition	Bending	Twisting
B & S both ≤ 110	1.5 mm/meter	1.5 mm/meter
B or S > 110	2 mm/meter	2 mm/meter

Table 3: Straightness tolerances (q_{max}) for rectangular section bar

Straightness	Value of q_{max} (mm)	Condition
	$(L \times 1.5)/2000$	B & S both ≤ 110
	$(L \times 2)/2000$	B or S > 110

Bulging on the sides shall not be more than $0.01 \times B$ & $0.02 \times S$ respectively

Table 4: Out of section tolerance for rectangular section bar:

Out of section	Nominal Thickness (mm)	Tolerance(mm)
	$10 < S \leq 25$	$u \leq 0.5$
	$25 < S \leq 40$	$u \leq 1.0$
	$40 < S \leq 80$	$u \leq 1.5$
	$S > 80$	$u \leq 3.0$

2. Cross referred documents: HW10663, HW10670, HW10786, HW10687, HW12784 and EN10269.

REV.
NO. 01

निर्माणकर्ता
WORKED BY

SANDIP
CHAKRABORTY

जांचकर्ता
CHECKED BY

ANIL KUMAR

05/06/2020

05/06/2020

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स्वतंत्रता और गोपनीय

इस दस्तावेज़ में दी गई सूचना भारत भारती लिमिटेड की सम्पत्ति है। इसका प्रयोग अन्य किसी भी उद्देश्य के लिए या इस दस्तावेज़ में दी गई सूचना के बिना नहीं किया जा सकता है।

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जांचकर्ता
INVENTORY NO.

REV. NO. 01

05/06/2020

डॉक्यूमेंट सर्वर पर मौजूद कर दी गई है।
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संशोधन प्रपत्र
CHANGE ADVICE FORM



संशोधन सूचना संख्या
CHANGE ADVICE NO.

जारीकर्ता विभाग
ISSUING DEPTT. TBM

उत्पाद का प्रकार
TYPE OF PRODUCT
Turbine blade

जीएमएस/जीआर
रससी/सीबीएम सं
GMS / GRSP
/CBOM NO.

मुद्रण वितरण
दिनांक
PRINT
DELIVERY DATE

स्वीकृतिकर्ता
APPROVED BY
Date 06/06/2020
Signature

75X (TBM) 20-166

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संशोधन
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REV. NO.

संशोधन का
कारण सूच
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REASON
OF CHANGE

संशोधन का विवरण
DETAILS OF REVISION

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AS IT EXISTS

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जैसा होना चाहिए
AS IT SHOULD BE

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प्रकार्य मर संख्या
CHANGABLE
HEAD NO.

सीबीएम/जीएमएस /
जीआरएससी की
प्रकार्य सं
VARIANT NO. OF
CBOM/GMS/GRSP

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/जीएमएस सं
जीआरएससी सं
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GRSP NOS./
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addition
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specification
under
the same
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c/a
No.. TSX(TBM)20166

Super Seeded by new plant standard

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