

15.04.2024

MPR 20230770 REV 01 INDENT NO 20232673

01.00	PRE QUALIFYING CONDITIONS	REQUIRED	OFFERED	DEVIATION
01.01	Only OEM or OEM authorised vendors who are supplying multi point HSS PM grade Tools from the last fifteen years (from the date of opening of the tender) can quote. In case of OEM authorised vendors, authorisation certificate from OEM should be submitted along with offer.	Vendor to accept/agree		
01.02	Name of customer / company where these multi point HSS PM grade Tools as mentioned above have been supplied along with their Purchase Order copies. Offer without this document shall be rejected. However in the submitted PO copy, offered price may be concealed by suitable means. Any other satisfactory documentary proof is also acceptable.	Vendor to submit details		
01.03	Proven and application specific tools are required for seal strip milling of steam turbine blades of critical nature from high alloy steels in CNC milling machines. Hence, following either of any document is required from participating vendor as qualifying requirement:- a) Quality Acceptance documents b) Accepted Store Received Voucher (SRV) c) Successful performance certificate from thier customer d) Invoice copy of payment (price may be concealed) of two consecutive POs of thier same customer e) Any documentry proof from thier customer. In case of successful trial in BHEL, vendor to inform accordingly with suitable references. Offer without this document will be rejected.	Vendor to submit details		
01.04	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	Vendor to note		
02.00	REQUIREMENTS OF BHEL:-			
02.01	Purpose & Item Description:- Set of Profile Relieved Cutters(as per drawing sketch, refer Annexure I) are required for seal strip milling operation on shroud side of freestanding LP blades in Vertical Milling Machine. Sketch I as provided in Aneexure I is for reference only. Vendor may design thier cutter and offer accordingly. Vendor shall submit technical drawings of their offered cutter alongwith their complete offer for technical scrutiny of the offers.	Vendor to note		

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03.00	TECHNICAL CONDITIONS FOR TRIAL MACHINING:			
03.01	Vendors shall supply One set of cutter same as offered against BHEL requirement as a sample on FOC basis on returnable basis as intimated by BHEL for submission of sample tools, for trial machining operations as per clause 03.02 and 03.03.	Vendor to accept		
03.02	Sample Tools as supplied by vendor shall be tried for machining of seal strips on existing Jobs Sachman make Vertical milling machine as per input material & cutting parameters (clause no 03.03).	Vendor to accept		
03.03	Input Material ,Cutting Parameters, operations & Machine Details:- (a) Feed-30-40 mm/min, RPM-200, DOC- 1 mm or more. (b) For above parameters Cutting Speed $V_c=50\text{m/min}$ (Cosidering Dia 80mm Cutter), however vendor may suggest their own cutting speed. (c) Material Grade (X20Cr13) Hot rolled material (material property details as per <u>Annexure II</u>) (d) Input Job:- Rectangular Cross section of blanks- as per availability in BHEL Shop. (e) Machine:- CNC Jobs Sachman make machine. (f) Adopter to be used :- SK50(DIN69871) tapered adopter of bore diameter 40mm. (g)Operation to be carried out in trial:- Seal Strip milling on rectangular cross sectional bar blanks on length of minimum 100 mm using BHEL provided Program on existing Jobs Sachman make CNC Vertical Milling machines. <u>Annexure-III</u> depicts the required fin dimensions to be maintained after the operation with the trial cutter.	Vendor to accept		
03.04	Technical Acceptance Criteria:- (a) The dimensions(width, height, and angle) and the gap of the seals manufactured on the trial blank piece shall be within tolerances mentioned in sketch 2 of <u>Annexure-III</u>. If the dimensions is found satisfactory, the cutter will further be used to manufacture the fins of same dimensions in minimum 05 nos of blanks pieces. The dimensions of the fins in all the 05 blanks must be within tolerance. (b)The milled strips across the length of the blank shall not be found broken or bend after the operation. (c)The teeth of all the segments of the milling cutter must remain intact after conducting trials on 5 blanks.	Vendor to accept		
03.05	Offers of only those vendors will be considered as technically acceptable whose tools performs satisfactorily as per technical acceptance criteria (clause no 3.04). A failed trial will result in rejection of the offer.	Vendor to accept/agree		

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03.06	There shall not be any liability on BHEL for failed trial. Price bid shall be opened only for those vendors who have been found successful as per specified criteria (clause no 3.0). Subsequently, ordering shall be done on L-1 vendor as per GEM policy. There should not be any financial implication of the trial machining on BHEL.	Vendor to accept/agree		
03.07	After trial, tools brought by vendor can be taken back by them. Sample of tools after its use during trial may or may not be in good condition. Vendor must be ready to take the sample in damage/consumed condition. For this, vendor must confirm explicitly to take material, brought in for trials, back themselves irrespective of the condition and quantity of the materials.	Vendor to confirm		
03.08	In case of PO placement, vendor shall supply the cutters having same design, material, geometry and coating, same as that of the sample tool which was technically accepted at the time of trial at BHEL. If the quality of tools supplied in PO after sample acceptance is found inadequate or any deviation, the total supply will be rejected as per BHEL practice.	Vendor to accept/agree		

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Annexure-I

Required Cutter sketch 1

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Annexure-II

Material Property Details

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Elements		Material wise composition (in % weight)
Symbol	Name	X20Cr13
C	Carbon	0.17 - 0.22
Si	Silicon	0.10 - 0.60
Mn	Manganese	0.30 - 0.80
P	Phosphorous	< 0.030
S	Sulphur	< 0.020
Cr	Chromium	12.5 - 14.0
Mo	Molybdenum	-
Ni	Nickel	0.30 - 0.80

Mechanical Properties:

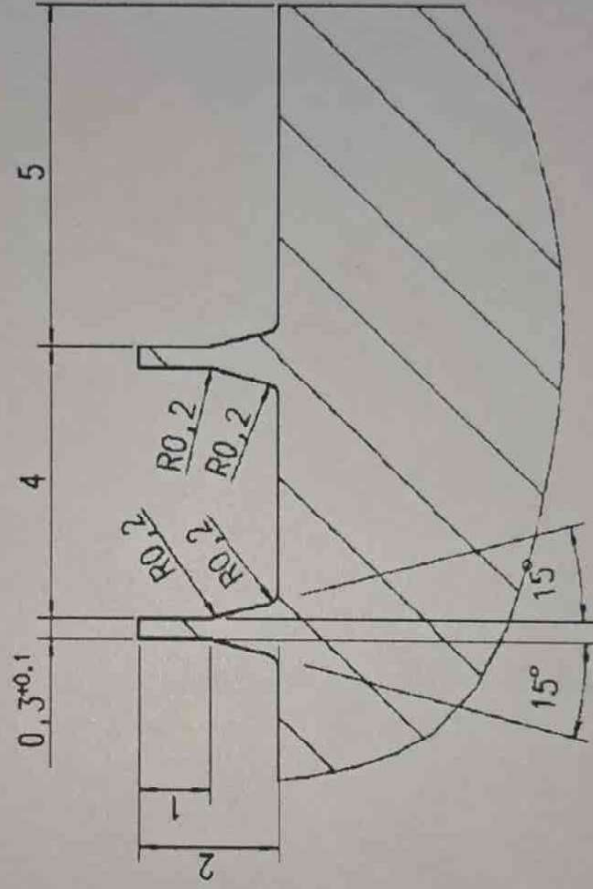
Property	Value
	X20
0.2% Yield Strength	> 600
Tensile Strength	800 - 950
% Elongation (l=5d)	> 15
RA (%)	> 50
Impact Energy (J)	> 20
Hardness (HB)	< 280

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Annexure-III

Sketch 2 of Required Fin Dimensions after carrying out trials



Deposited

Sketch

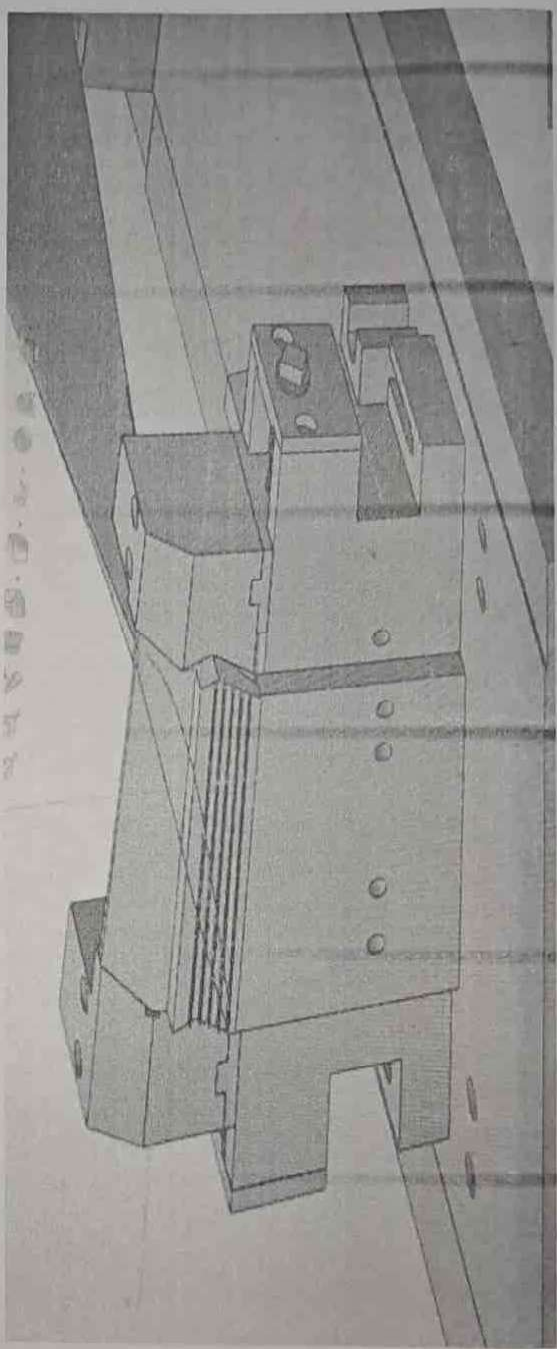
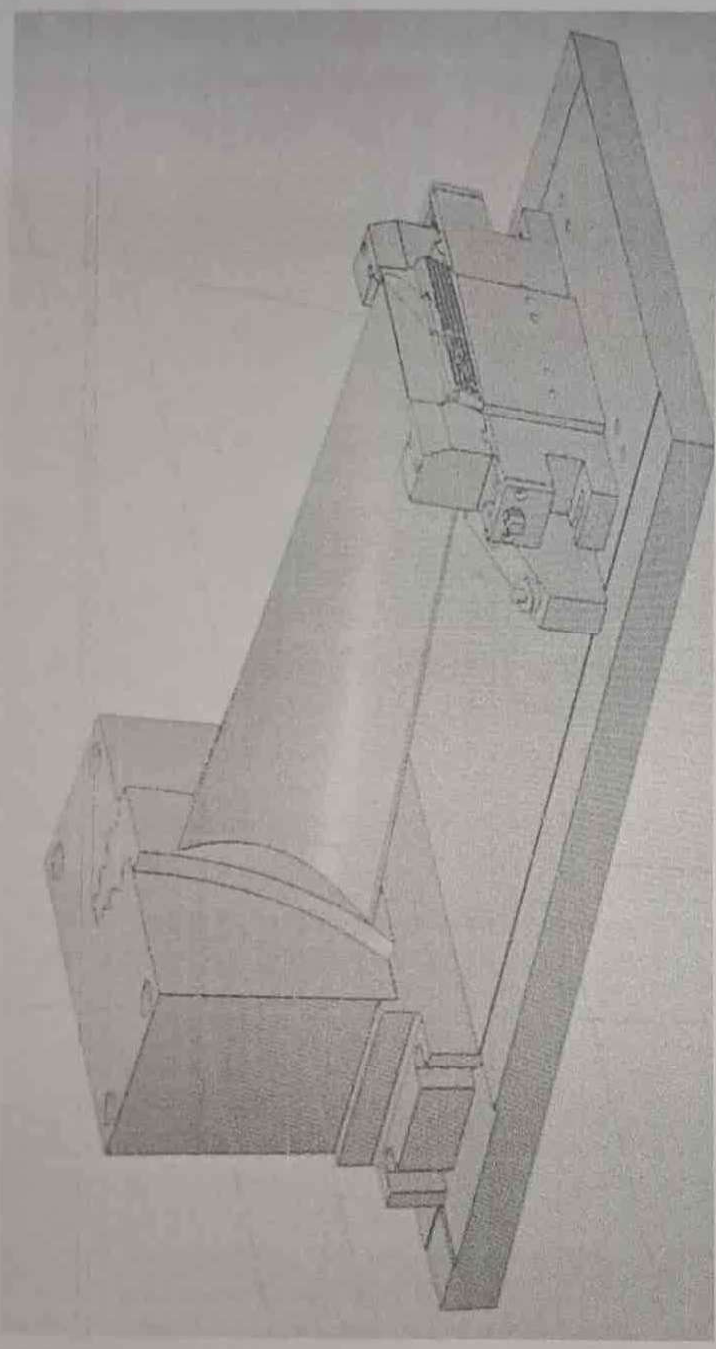
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Picture of blade holding fixture



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