GOVERNMENT OF INDIA
Bhabha Atomic Research Centre
Cryo-Technology Division

Ref: - BARC/CrTD/SKB/2019-20/OPA/176477
Tender No.: BARC/CrTD/SKB/2019-20/OPA/176477
Date: 18.9.19

Tender Due Date: 10/10/19 , 11:00 hrs.

Sub: Invitation of quotation for fabrication of Spiral Groove Bottom & Top Thrust Bearing (20 nos. each) and Permanent Magnet Bearings (PMB) with fixtures as per drawing and specifications.

1. **Qualifying criteria for bidders**
   1.1 Firms willing to bid for above mentioned job shall have been vetted by Security Section of BARC.
   1.2 All the supervisors and workers should have valid Police Verification Certificate (PVC). The list of manpower available with firm shall be submitted along with their details of PVC.
   1.3 The past experience of the firm in similar nature in BARC/DAE shall be made available with Work Order copy and satisfactory completion certificate from the user. Also, the list on of going jobs inside BARC premises with expected completion period shall be provided.
   1.4 Interested bidders shall produce a sample 1.5 mm width groove in LTB6 with 20 micron depth with accuracy of one to two micron before or with the quotation. The process shall be photo etching. Contact for any doubts, before submitting the quotation the undersigned on Phone No. 2559 26868 (Ext. No. 6868) with above mentioned details for getting the detailed Tender Specification and submission of grooved sample.

2. The quotation envelope shall be superscripted with **Description of the job and the Tender Ref. No.**, mentioned above.

3. The complete quotation shall reach the following address on or before 23/9/2019 by Registered Post/ Speed post. The quotations will be opened on the next working day in Cryo Technology Division, BARC between 1430 to 1600 Hrs.

Head,
Cryo Technology Division, CFB
Bhabha Atomic Research Centre,
Trombay, Mumbai- 400 085
4. **Printed Letter Head:** Quotation should be printed on the letter head; computer generated quotation is not valid.

5. **Validity of the Offer:** Validity of the offer shall be 90 days from date of opening of quotation.

6. **Guarantee:** Vendor shall have to give guarantee of the quality and workmanship of work done for the period of 12 months from the date of completion of the work.

7. **Work site:** BARC/CrTD/CFB (Common Facility Building).

8. **Completion Period:** 6 months from date of receipt of work order.

9. **Offer of Firm:** Offer of those firms, who do not submit their quotation as per the details given in the technical specification and incomplete quotations in any respect shall not be considered. Contractor shall quote lump sum price for the execution of the complete job. The price quoted shall remain valid at least for three months time from the date of offer.

10. The department reserves right to extend the date of opening the quotations.

11. **Payment Terms:** Accounts Division BARC Mumbai-400085 shall make full and final payment through ECS only after submission of the satisfactory work completion certificate issued from the undersigned, bill, guarantee certificate, delivery challan, ECS and advanced stamped receipt. No advance is admissible.

12. **Income Tax Recovery Clause:** Income tax @ 2% will be deducted from the bill.

13. If any of the employee, consultant, or partner of the company is an Ex BARC employee, the same must be stated in the quotation clearly.

14. **Penalty:** Any delay which attributable to the contractor is liable for penalty @ 0.5% per week (max 5%) to be imposed on contractor.

15. **ST/VAT/PAN Number:** Quotation shall consists of Sales Tax Registration Number registered with local ST authority /CST authority, PAN number of the firm, service tax registration number etc.

16. **Quantity Variation Clause:** Quantity variation of ± 10% is possible during the execution of the job. Actual payment shall be made based on the actual work carried out by the contractor after completion of entire job.

17. **Safety & Security Rule:** The vendor shall follow all the safety procedures as per the normal industrial practice during the execution of the job at site. Any mishap occurring during the work due to unsafe workmanship shall be the vendor's liabilities. Security and transportation rules at BARC, Trombay premises shall be strictly followed.

18. **Confidential Clauses:**

   i. **Confidentiality:** No party shall disclose any information to any third party concerning matters under this contract generally, in particular, any information identified as “Proprietary” in nature by the disclosing party shall be kept strictly confidential by the receiving party shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to
the sub-contractors, consultants, advisors, or the employees engaged by a party with equal force.

ii. “Restricted information” categories under section 18 of the Atomic Energy Act, 1962 and “Official secrets” under section 5 of the of the Official Secret Act, 1923: Any contravention of the above mentioned provisions by any contractor, sub-contractor, consultant, advisor or the employee of a contractor will invite Penal consequences under the aforesaid legislation.

iii. Prohibition against use of BARC’s name without permission for any publicity Purpose. The contractor or Sub contractor, consultant, advisor or the employees engaged by the contractor shall not be use any public purposes through any media like press, TV, or internet, without the prior written approval of BARC.

[Signature]
(Satish Khurana)
(Indenting Officer)
Annexure - II
Specifications Sheet

The technical specifications for Fabrication of Spiral Groove Bottom & Top Thrust Bearing (20 nos. each) and Permanent Magnet Bearings (PMB) with fixtures at CrTD, CFB are as follows:

Specification for Leaded Bronze Spiral Groove Thrust Bearings (top and bottom)

Material composition: LTB 6

<table>
<thead>
<tr>
<th>Material</th>
<th>Wt.%</th>
<th>Material</th>
<th>Wt.%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn</td>
<td>4 - 6</td>
<td>Ni</td>
<td>2</td>
</tr>
<tr>
<td>Pb</td>
<td>18 - 23</td>
<td>Si</td>
<td>Max 0.02</td>
</tr>
<tr>
<td>Zn</td>
<td>1</td>
<td>Sb</td>
<td>Max 0.5</td>
</tr>
<tr>
<td>Fe</td>
<td>Max 0.35</td>
<td>Impurities</td>
<td>0.8</td>
</tr>
<tr>
<td>Cu</td>
<td>Rem.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Note: Blow Hole and Porosity totally Negligible.
- After Casting it should be Annealed condition.

Lower thrust bearing and upper thrust bearing 20 nos. each:- These part are the most critical parts of the turbo-expander assembly which is having an ultra speed of 2,40,000 rpm. The dimensions mentioned in the drawing have to maintain without fail. The vendor shall be produce a sample 1.5 mm width groove in LTB6 with 20micron depth with accuracy of one to two micron before the approval of the order. The process shall be by photo etching. The department will provide the mask of the grooves and the vendor should have the computer competency to convert this in to IGS form for its machining. The overall run out of the component is 0.005 microns and vendor should have the metrology facility to check the dimensions. Machining of Top Thrust Bearings as per drawing attached marked as A3/CrTD/TEX16/SHA/006. Machining of Bottom Thrust Bearings as per drawing attached marked as A3/CrTD/TEX16/SHA/006.
Specification for Magnet Ring:

Magnet Rings 100 nos.: The materials to be used are samarium cobalt. It is a free issue materials (FIM). The alloy is sintered to fabricate the magnet rings. The vendor shall have the EDM facility to cut the the ingots. The EDM wire should be either 0.25mm or max 0.5mm to achieve the surface finish of the magnet rings. The vendor should have proper safety equipments (Like vacuum hood and proper enclosure) to prevent health hazards due to the dust of samarium cobalt. The dimensions are given in the drawing and it should be followed strictly. Machining of magnet ring as per drawing attached marked as CrTD/1K/MJ/25/01. Cutting of magnet ring as per arrangement attached 3-D model.

Specification for Magnet Fixture:

Material: SS304

Quantity: 1 no.

Machining of magnet fixture as per drawing attached marked as CrTD/1K/MJ/25/02.

Note: Kindly contact me in contact details if parties have any doubt regarding drawings and specifications.