Sub: Fabrication of Vacuum Retort for heat treatment (2 Nos.)

Dear Sir,

Your sealed offer is invited for & on behalf of President of India for Fabrication of Vacuum Retort for heat treatment (2 Nos.) as per enclosed scope of work, technical specifications, terms and conditions.

Your offer in sealed envelope should be addressed to

Head,
Integrated Fuel Fabrication Facility
BARC, Trombay, Mumbai - 400 085.
Attn.: Kumar Jaideep

and duly marked with above reference no. and due date on the sealed envelope, reach us on or before 20th November, 2020, 16-30 hrs by Speed Post/Registered Post only.
Technical specification for Fabrication of Vacuum retort for heat treatment

Scope of the job: Fabrication, Testing, Supply & guarantee of Vacuum retort for heat treatment (2 nos.) to achieve following objective.

Objective: Leak-tight retorts are required for heat treatment of metallic components. They are to be suited for heat treatment processes requiring a vacuum. Vacuum requirement = 1x10^-5 mbar. Maximum working temperature = 1100°C.

Major Components:

1. **Retort:** Creep-resistant Alloy retort (Material of construction: Inconel 625) to be manufactured as per drawing. The retort is cylindrical in shape with calotte-shaped bottom. Wall thickness of retort = 15 mm.

2. **Top flange and Water Jacket:** The top opening of the retort is provided with a closure flange. The sealing flanges of the retort and the lid are water-cooled employing an integral jacket built into the retort flange with provision for circulating water, to ensure sufficiently low working temperature of about 80°C. To be manufactured as per drawing. Material of construction: SS 304.

3. **Lid:** The top end of the retort is equipped with a lid to allow opening of the furnace and putting the charge in the working space. The lid is sealed against the retort with a flange connection, where both the lid and the retort have flanges, and a rubber o-ring is the sealing element. The lid is closed with a mechanism that clamps both flanges with the seal in between. The lid also has provision for insertion of thermocouple into an integral thermowell, along with ports for evacuation, introduction of inert gas & vacuum gauge. Material of construction: SS 304

Requirements:

1. The retort should sustain the specified level of vacuum for 2 hrs continuously under working temperature. The purchaser will test the finished equipment at vendor’s location for fulfilment of this requirement during inspection.

2. The supplier must submit Material test certificates of the raw material to the customer prior to initiating fabrication. Material composition testing shall be carried out at any Govt. approved testing centre and all the testing charges shall be borne by the supplier.

3. Dimensional test certificates of the finished components authenticated by the supplier must be provided.

4. The supplier is to follow best practices with regards to workmanship. The drawing dimensions are meant for strict conformity.

5. **Welding requirements:** GTAW is to be applied for all welding operations with the following requirements:
a) Bright, smooth & clean finish.
b) Bead free from undercuts, pitting, concavity, cracks & inclusions
c) The finished product satisfies the design dimensions and has almost no distortion.
d) Full penetration welds that fuse and join the entire interface between the base materials.

Quality of the weldment joining the Retort to the Top flange shall be assured as follows:

a) 100 % Radiographic Examination of the weld shall be carried out. Radiographic Acceptance Criteria will be as delineated in ASME BPVC Section IX (QW-191).
b) Liquid Penetrant Examination of the weld shall be carried out in compliance with ASME BPVC Section IX (QW-195).

The above two certifications shall be approved by any Govt. accredited testing centre and the examination reports & accompanying radiographs shall be furnished to the purchaser for record. All the testing charges shall be borne by the supplier.

The customer reserves the right to reject/demand replacement for the supplied parts in case of sub-optimal quality of the finished product during in-service testing.

Other terms and conditions

1. The manufacturing drawing and BOM for construction of the system shall be submitted for approval prior to commencement of fabrication.

2. There may be minor changes in some dimensions in the drawing and these changes shall be informed by purchaser well in advance of fabrication. Vendor shall agree to accept those changes in drawings.

3. The product will only be cleared for delivery once the testing is satisfactory. Purchaser’s representatives may provide feedback for corrective actions reg. the fabrication to improve quality of the final product. Vendor shall adhere to such suggestion.

4. The final product should not have any foreign residues (grease, dirt, paint, detergent etc.) anywhere inside or outside the assemblies.

5. Care shall be taken by the supplier to ensure safe delivery of the material at site. The supplier shall be responsible for packing the material adequately so as to prevent damage of any kind during shipment to the purchaser’s site.

6. Price: The price mentioned in the offer shall remain firm during the completion of the contract.
7. Material to be delivered to IF3, South Site Zonal Stores, BARC, Trombay, Mumbai – 400 085 under advance intimation to Shri Kumar Jaideep, Ph: 2559 5641/4526.

8. For entering inside BARC premises vendor shall arrange Police Verification Certificate (PVC) for their personnel and obtain required BARC security clearance in advance for entire duration of contract.

9. Payment Clause: 100% payment including taxes & duties applicable will be paid only after satisfactory completion of work and submission of the following documents:
   a. Advance Stamped Receipt, Original Bill in Triplicate and Guarantee/Warrantee Certificate, installation & commissioning report etc. Payment will be made through ECS/RTGS after filling option form. Option form will be provided along with work order.
   
   b. Payment will not be made on prorate basis. Part payment & advance payment is not possible.
   
   c. The Contractor/service provider will not be entitled to claim any interest on account of delay in receiving any payment.

10. Income Tax: Income Tax @ 1.5% and GST TDS @ 2% will be deducted from vendor bill.

11. Delivery Period: Work completion time is six months from date of issue of Work Order.

12. GSTN Invoice: GSTN invoice should have details of a) GSTN b) PAN & c) Location of supply d) tax component to be separately indicated.

13. GST @5% shall be paid since theses goods are to be supplied against the work order meant for research purpose of a research organization under DAE; the necessary GST will be exempted to the party.

14. Supplier will have to submit undertaking stating that GST has been promptly deposited with the authority (copy of blank under taking will be provided with work order).

15. Guarantee: Guarantee for system, material quality & workmanship shall be provided for period of one year from date of supply of material to BARC.

16. If required, party is required to send request letter for extension of delivery period before expiry of work order.

17. Penalty:- Any delay in supplying the finished components, which is attributable to the contractor, is liable for penalty @1/2 % per week (max 5 %) to be imposed on the contractor.
Confidentiality clause:

1. **Confidentiality:** No party shall disclose any information to any third party concerning the 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 and shall not be disclosed to any other third party without the prior consent of the original disclosing party.

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

3. **Prohibition against use of BARC’s name without permission for publicity Purposes:** The contractor, sub-contractor, consultant, advisor or the employees engaged by the contractor shall not use BARC’s name for any publicity purpose through any media like press, radio, TV or internet without prior written approval of BARC.

Signed

Kumar Jaideep  
(SO/D, IF3)  
BARC

Date: 19/10/20

Signed

Baljit Kumar  
(SO/F, IF3)  
BARC

(for and on behalf of the President of India)
1. Retort with closure flange

---

**Bill of Material**

<table>
<thead>
<tr>
<th>Part Name: Retord</th>
<th>Parts</th>
<th>Std</th>
<th>Part Name</th>
<th>Std</th>
<th>Matl.</th>
<th>Qty</th>
<th>Qty: 1 Set</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>9</td>
<td>Retord</td>
<td>9</td>
<td>Inconel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
<td>Nut</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>9</td>
<td>Bolt</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>9</td>
<td>Bush</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>18</td>
<td>Plate</td>
<td>9</td>
<td>SS 304</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>MS</td>
<td>Stud</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Water Jacket