Ref- IF3/2019/01/ 193049

October 17, 2019

Tender No.: BARC / IF3 / 01 / 2019 / 193049
Due Date: 07/11/2019

Sub: "Fabrication and supply of Silica Reactor, Nutsch Filter and Reactor Basket at IF3."

Sealed quotations are invited for and on behalf of the President of India for "Fabrication and supply of Silica Reactor, Nutsch Filter and Reactor Basket at IF3."

The following should be superscribed on the top of envelope containing quotation.

- Tender due date
- Tender No.,
- Party's Name & address and "Kind Attention to: D K Verma, Technical Officer, IF3, BARC, Mumbai-85"

Sealed offers should reach at the following address by SPEED POST (INDIA POST) only on or before DUE DATE: November 07, 2019, TIME: 16:00 Hrs.

Address: To,

Head, IF3
South Site, BARC
Trombay, Mumbai-085
Contact no.: 022 2559 4473/4596
(The scope of work, completion schedule, quantity and technical specifications are as given below)

**PART A: Technical specifications and scope of the work**
**PART B: Terms & conditions**

(PART A)

A. **Fabrication and supply of Silica Reactor, Nutsch filter and Perforated Reactor Basket.**

The following is the entire scope of the work.

1. **General details of the equipments**

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Equipment</th>
<th>Dimensions</th>
<th>MOC</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Silica Reactor</td>
<td>400 mm (D) x 500 mm (H) x 3 mm thk.</td>
<td>SS304L</td>
<td>01 No.</td>
</tr>
<tr>
<td>2</td>
<td>Nutsch Filter</td>
<td>450 mm (D) x 600 mm (H) x 3 mm thk.</td>
<td>SS304L</td>
<td>01 No.</td>
</tr>
<tr>
<td>3</td>
<td>Spider sparger</td>
<td>Circle diameter: 300 mm (D) x 8 arms (8NB)</td>
<td>SS304L</td>
<td>01 No.</td>
</tr>
<tr>
<td>4</td>
<td>Reactor Basket</td>
<td>100 mm (D) x 200 mm (H) x 5 mm thk.</td>
<td>SS304L</td>
<td>02 Nos.</td>
</tr>
</tbody>
</table>

2. **Objective:** The Silica Reactor will be used for liquid-liquid mixing of the nitric acid based solution and a viscous liquid. The slurry generated will be filtered through Nutsch filter.

3. **Technical specifications of Silica Reactor**
   A. **Basic design details:** as per the attached schematic diagram.
   B. **Reactor type:** Cylindrical shell with Dished Bottom End and Flat Flanged Top End (flange thickness: 5 mm), batch type meant for liquid - liquid chemical reaction.
   C. **MOC:** SS304L, Gaokt: Shall be suitable to 150°C, having thermal insulation property and inert to nitric acid.
   D. **Reactor overall dimensions:**
      - Shell: 400 mm (D) x 500 mm (H) x 3 mm (thk), Top flange 500 mm (D) x 6 mm (thk)
      - Top Cover: 500 mm (D) x 5 mm (thk)
   E. **Reactor nozzles schedule:** Flanged nozzles as per the attached schematic diagram, MOC: SS304L
   F. **Spider Sparer**
      - **Basic design details:** as per the attached schematic diagram
      - Sparger circle diameter: 300 mm
      - No. of arms: 08 arms equally spaced at 45° angle
      - MOC: SS304L
      - Central pipe: 25NB, Sch 40S, 500 mm length
      - Air distribution housing: 50NB(D) welded with 8 arms
      - Arm dimensions: 8NB, Sch 40S, 300 mm length
   G. **Surface Finish:** Mirror finish
   H. **Support:** SS304L bracket support
4. Technical specifications of Nutoch Filter
   A. Brief description: The Nutsch filter has two flanged cylindrical part (Filter pan and Receiver). The Pan has perforated bottom to pass filtrate through it and the filter cloth will be placed over the pan. The filter cloth with retain insoluble material.
   B. Basic design details: as per the attached schematic diagram
   C. Type: Cylindrical shell with bottom dished (Receiver) and Cylindrical shell with flat perforated bottom (Filter- pan)
   D. Material of construction: SS 304L
   E. Cylindrical shell dimensions: 400 mm (D) x 300 mm (H) Pan x 300 mm (H) Receiver
   F. Cylindrical shell thickness: 3.0 mm (minimum)
   G. Pan- Receiver connecting body flange thickness: 5 mm
   H. Perforation dimensions & pitch : 3 mm (D), 7.5 mm triangular pitch
   I. Top Cover: Split type top cover provided with 25 mm diameter centre hole for Silica Reactor drain pipe. A nozzle (25NB) with serrated hose ripple is to be provided for exhaust connection.
   J. Top cover thickness: 3 mm
   K. Bottom head: Dished bottom head (3 mm thick) with a bottom drain nozzle (Flanged, 15 NB, Sch 40S)
   L. Surface finish : Mirror Finish
   M. Support : SS304L bracket support

5. Technical specifications of Perforated Reactor Basket (RB):
   A. Basic design details: as per the attached drawing.
   B. Perforated Reactor Basket (RB) dimensions: 100 mm (D) x 200 mm (H) x 5 mm thick. The Reactor Basket should be easily detachable type from HSR shaft for charging/discharging in each batch operation. The reactor basket shall be meant for charging of solid reactant and retainer of hull after completion of reaction. The hull shall be discharge from basket after each batch operation.
   C. Perforation dimensions & pitch : 3 mm (D), 7.5 mm triangular pitch
   D. Surface Finish : Mirror finish

B. Fabrication drawing:
   - Supplier must discuss the process requirement with purchaser and submit design and detailed dimensional drawing of equipment & its parts and take approval from us before starting the fabrication work.

C. Quality assurance plan for fabrication.
   C.1. Procurement of raw materials:
   The raw material SS304L required for the above work should be purchased from reputed and approved dealers only. The materials shall be offered for material inspection and identification. After receipt and stamping the materials, it will be sent for testing at govt. approved testing labs. The sample will be drawn, identified, sealed in front of BARC’s authorized representative. After testing and final approval only this material will be used for further fabrication. Raw material and weld material shall meet the requirements of ASME Sec. II or ASTM standards.
   C.2. Transportation:
   - The process vessels should be packed so that no damage during transit occurs
   - Contamination of two different metals should be avoided.
C.3. Welding procedures and qualifications tests
Welding procedure for SS304L welds should be GTAW (TIG Welding) process for all passes. All joints should be full penetration welds. The root passes for weld joints, accessible from only outside should be continuously back purged with argon during welding. The argon gas used should be of 99.95% purity. Compatible filler wires for the TIG welding should be used.
Surface to be welded should be made free from paint, oil, grease, dust or any other contamination. Cleaning of surfaces / weld edge preparations / completed weldments should be done by use of approved solvents.
Tack welds should be examined for cracks before continuing with further welding and any defects observed should be done by qualified and approved welders.

QA procedures for Weld joints:
i) Visual inspection
ii) D.P. test of all welded joints

D. Scope of BARC: Free water and electricity will be available at site

E. Supplier’s scope: All the materials required for above mentioned job are in supplier’s scope.

Important Notes:
- The items, neither mentioned in the scope of BARC nor in that of the supplier, if required during the execution of work, will be in the supplier’s scope. Supplier should be ready to accommodate minor modifications. The job is “important and urgent” in nature. Hence, the vendor is expected to have a clear understanding of the job in the first place, so execution can be fast.
- In technical bid, vendor should address all the points as mentioned in our detailed technical specifications. No point should be kept blank or ambiguous - it may affect bid evaluation.
- GSTIN & PAN should be clearly mentioned in the quotation, without which the offers will not be considered.

(PART B)
TERMS AND CONDITIONS

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 10 of the Atomic Energy Act, 1962 and “Official Secrets” under section 5 of the Official Secrets Act 1923:
3. Any contravention of the above mentioned provisions by any contractor, subcontractor, consultant, advisor or the employees of a contractor will invite penal consequences under the aforesaid legislation.
4. 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.
SAFETY: Contractor shall take all the safety precautions while working in the department and shall be solely responsible for any incident happening to his employees during the course of work in the department.

PRICE: Offered cost shall be valid for the entire scope of work (materials, fabrication, supply, installation, taxes, packing & forwarding, transportation etc). Maximum possible break-up price should be given in the offer.

VALIDITY: Offer should be firm and valid for next three months.

TAX: As applicable shall be indicated clearly and separately.

COMPLETION PERIOD: **08 weeks** from the date of the releasing the work order. The work completion schedule should be strictly adhered with. Any delay which is attributable to the contractor is liable for penalty @ 0.5% per week (max 5%) on total work order value. In case extension in work completion period is required, request for it with proper and valid justification is to be sent to us positively before the expiry of work completion period.

INCOME TAX: Income Tax @2% and 2% GST TDS shall be deducted from vendor's bill.

GST CONCESSIONAL CERTIFICATE: The equipments to be fabricated will be put in service for R&D purpose only. Hence, GST concessional certificate will be issued by department.

PAYMENT: 100% payment including taxes will be made after delivery of material and successful completion of work and submission of following documents:

- a. Original bill
- b. Advance stamped receipt
- c. Guarantee Certificate
- d. After receipt of site clearance certificate by the contractor issued from the BSMO (BARC Swatch Monitoring Officer).
- e. Contractor shall fill up the option for payment through ECS/RTGS with pre-stamped receipt at the time of payment.

GSTIN INVOICE: Invoice raised by a registered supplier of taxable goods/services along with other details specifically indicates:

- a) GSTIN
- b) PAN
- c) Location of supply
- d) Tax component to be separately indicated in the invoice.
- e) An undertaking shall be submitted that the GST has been promptly deposited with the authorities.

(D K Verma)
Technical Officer-D, IF3

(Santanu Das)
Superintendent, PPL, IF3
A. Silica Reactor (Schematic Diagram)

1. MOC: SS304L, Dimension: 400 mm (D) x 500 mm (H)
2. Shell Thickness: 2 mm
3. Top Cover Thickness: 5 mm
4. Pipe Thickness: SCH 40S
SPIDER SPARGER (Top View)
(Schematic Diagram)
8. NUTSCH FILTER (Schematic Diagram)

1. SIZE: Overall \( \phi = 450 \text{ mm} \)
   \( h = 600 \text{ mm} \)

2. MOC: SS304L \( t = 3 \text{ mm} \) (Shell)
   \( t = 1.5 \text{ mm} \) (Lid)