

दूरभाष :
TELEPHONE :
तार : बार्क-मुंबई, चेंबूर,
TELEGRAMS : BARC-MUMBAI. CHEMBUR.
टेलिग्राम : ०११-६१०१७/०११-६१०२२ बार्क इन
TELEX : 011-61017/011 - 61022 BARC IN
फैक्स संख्या : ९१-२२ ५५६०७५०
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भारत सरकार

GOVERNMENT OF INDIA

भाभा परमाणु अनुसंधान केंद्र

BHABHA ATOMIC RESEARCH CENTRE

मुंबई,
मुंबई-४०० ०८५,
TROMBAY,
MUMBAI-400 085.

Materials Processing & Corrosion Engineering Division

September 26, 2018

Prafful Kumar Sinha,
Scientific Officer - D,
MP&CED.

Ref: BARC/MP&CED/M-FAB/PKS/2018/184331

**Sub: Minor Fabrication: Setup for Jet-pickling & cleaning of ID side of titanium tubes.
Due Date and Time: 1400 hrs on October 22, 2018.**

Dear Sirs,

You are requested to provide a quotation for the following minor fabrication work.

Sr.No.	Description of the job	Quantity
1.	Design, fabrication and commissioning of a setup for HF jet-pickling & cleaning of ID side of titanium tubes. Detailed work specification is given in the annexure - I.	1 (One).

Notes:

(1) The quotation, **on your Letter Head**, should be sent in a sealed envelope by **registered speed post only**, to the following address:

Prafful Kumar Sinha,
Materials Processing & Corrosion Engineering Division,
2nd Floor, Mod-Lab, D-Block,
Bhabha Atomic Research Centre,
Mumbai – 400 085.

Quotations sent by any other mode (hand delivery, courier, ordinary post, email etc.) will not be accepted.

- (2) **The reference no, due date and "Quotation, not to be opened before due date" should be clearly superscribed on top of this sealed envelope.** It should reach the undersigned within the due date given above. The quotations received after the due date will not be considered.
- (3) **It is to be noted that persons engaged in fabrication work at BARC complex would be required to obtain police clearance certificates for issue of requisite identity cards.** The responsibility of all the working personnel lies completely with the Fabricator/Contractor while they are working at MP&CED/BARC.
- (4) Time of completion of job: Within six months from the release of work order.
- (5) Our engineers at fabricator's works shall visit for inspection. Necessary inspection facilities should be provided to our engineers during fabrication at fabricator's premises.
- (6) Indicate taxes, if extra.
- (7) The Letter Head should incorporate PAN No., TIN No. and other relevant Nos.

- (8) BARC will provide certificate for concessional GST rate. It shall, however, be the responsibility of the contractor also to ensure that they dispatch the goods only after getting exemption certificates from the indenter.
- (9) Income Tax at 2%, will be deducted from your bill.
- (10) Guarantee Certificate: Equipment fabricated/repaired should be guaranteed, for materials and workmanship, for a period of one year from the completion date.
- (11) Indicate delivery terms.
- (12) Payment terms: Payment will be made after the work is completed and on the submission of advance stamped receipt, invoice bill and satisfactory work completion certificate from the user.
- (13) **CONFIDENTIALITY CLAUSE**
- (a) No party shall disclose any information to any third party concerning the matters under this contract. In particular, any information identical as 'Proprietary' in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior consent.
- (b) **“Resisting 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, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.
- (c) **Prohibition against use of BARC'S name without permission for publicity purpose:**
The contractor, sub-contractor, consultant, adviser or the employees of a contractor will not use BARC'S name for any publicity purpose through any public media like Press, Radio, T.V. or internet without the prior written approval of BARC.

Thanking you.

Yours sincerely,

(Prafful Kumar Sinha)

On and behalf of President of India

Annexure-1

Design, Fabrication and Commissioning of HF jet-pickling & cleaning of ID side of Titanium tubes

1.0 Background:

The set-up will be used for jet-pickling and cleaning of ID side of titanium tubes (18 mm OD x 2.5 mm thick) using HF (2-4%) + HNO₃ (5-10%) solution. The operation will be carried out at room temperature. The supplier should be responsible for the design & fabrication of the set-up and installation & commissioning of the set-up at purchaser's site (BARC, Mumbai). The set-up should be designed for approximately 0.5 m length tube and should consist of 3 tubes arranged in parallel. The general description and design aspect of the set-up is detailed as follow.

2.0 Description of set-up

2.1 Design aspects:

While designing the set-up, following points should be taken care of:

- (a) The test set-up should consist of 3 titanium tubes arranged in parallel with a common inlet and common outlet for the fluids. Arrangement should be made for the uniform distribution

of fluids to all the three test tubes.

- (b) The test setup should circulate the HF + HNO₃ solution through the three tubes for a user defined duration. Subsequently the setup should circulate demineralized water through the three tubes for cleaning the acid. There should be two loops, one for HF + HNO₃ solution and other for demineralized water being circulated through the three titanium tubes in sequence. Valves should be provided for the flow control of acid and DM water in sequence. These valves should be operated by a push-button based operation.
- (c) There should be a main storage tank which houses the test set-up. The tank material should be compatible with the acid solution in case of spillage.
- (d) There should be two separate storage tanks i.e. acid storage tank and water storage tank for independent recirculation of HF solution and respectively during the operation. The capacity of the acid storage tank and water storage tank should be 200 liters.
- (e) A magnetically coupled centrifugal pump should be provided for the recirculation of acid while a centrifugal pump should be provided for the recirculation of water.
- (f) VFD (Variable Frequency Drive) should be provided for attaining variable velocity in the tube.

2.2 Cleaning operation sequence:

The set-up should be designed such that following sequence of cleaning operation is being followed:

- (a) Acid is allowed to flow in the tube for a specific user defined duration (by operation of a push-button switch which will operate the inlet and outlet valves and the centrifugal pump). Acid will flow through the three tubes and will get collected in the acid storage tank. During this time the water pump remains in off position.
- (b) After the specified duration of flowing acid the pump will be switched off by a push-button switch. Subsequently, all acid should be drained out by gravity (for this purpose a slight inclination may be given to the tubes and when the acid pump is switched off, the acid inlet valve is switches off and the acid outlet valve closes after a specific delay).
- (c) Thereafter, the water inlet (and outlet) valve should open and the water pump should start operating. During this time the acid pump remains in off position. This opening and closing of valves in the sequence given in (a) – (c) should be achieved by push-button.
- (d) Initially water cleaning the tubes should be allowed to drain and should not go back into the water storage tank.
- (e) After given time-gap of flushing and draining the water, another valve should be operated manually to allow the water to go back in a storage tank (in a recirculation loop) after passing through the titanium tubes.

2.3 Material of construction:

- (a) All the material coming in contact with demineralized water (including the wet parts in the water pump) should be made of stainless steel.
- (b) All the material coming in contact with HF + HNO₃ solution (including the wet parts in the acid pump, tubes etc.) should be compatible with the acid for long term usage.
- (c) The main storage tank housing the setup should be compatible with the acid solution used for cleaning.

3.0 Scope of work

The scope of work for the supplier include the following.

- 3.1 Preparation and submission of detailed design & manufacturing drawing along with the quotation. Quotations received without the detailed design & manufacturing drawing will be rejected. Spares for one year of continuous operation should be included in the quotation.
- 3.2 Preparation and submission of Quality-assurance and Manufacturing plan.
- 3.3 Assembly of equipment and internal performance tests of sub-systems (e.g hydro tests of the components, dimension checks etc.) and overall equipment at supplier's site.
- 3.4 Officers from BARC should be intimated in advance and should witness the testing of the cleaning system at the manufacturers site. During testing, following documents should be provided to purchaser for inspection:
 - (a) Dimension inspection report
 - (b) Performance test report
 - (c) Calibration certificates
- 3.5 Disassembly, painting/finishing, packing of equipment, shipping of equipment to purchaser's site.
- 3.6 Installation & commissioning of the equipment at purchaser's site.
- 3.7 Provision of the following documents after commissioning:
 - (a) Operation manual
 - (b) Maintenance manual
 - (c) Design & manufacturing drawing

Note:

- 1. Titanium tubes will be provided as a free issue material (FIM).**
- 2. This will be a two-part tender. In Part-I, suppliers are required to submit a detailed drawing of the set-up and technical documents related to the fabrication of set-up e.g. material of construction for different components, scheme for jet pickling of the three tubes etc. If any clarifications are required by any party, a meeting will be fixed 7 days before the final submission date of the technical bids, at TSH lounge room, BARC, Mumbai (between 1100hrs to 1300 hrs). In part-2, financial bid will be opened for only those suppliers which meet the requirement of the user satisfactorily (based on technical bids received).**

Both the parts of the tender, Part-1 (Technical bid with drawing and detailed scheme for jet pickling) and Part-2 (Financial quote) are to be submitted together (but in separate sealed envelopes) before the last date announced for the submission of bids.