Government of India
Bhabha Atomic Research Centre
Laser & Plasma Technology Division
Trombay, Mumbai-400085

REF: LPTD/works/ YC/2020/77127 Date:26/08/2020

Sub : Minor Fabrication - invitation of quotations.

Dear Sirs,

1. Quotations are invited for Fabrication of double walled water cooled cylindrical plasma spheroidization chamber with specifications and details as per Annexure-D.
2. Bidder shall quote for fabrication of these components with material.
3. Taxes and excise duties shall be quoted separately. Form AF shall be provided where necessary.
4. The quotations must reach, Head, Laser & Plasma Technology Division by 04/09/2020 and must be sent in a sealed envelope super scribed with the above reference number and due date given above.
5. The address on the envelope should read:
   The Head,
   Laser & Plasma Technology Division
   Bhabha Atomic Research Centre,
   Trombay, Mumbai - 400 085.
   (Attn.: Y. Chakravarthy)
6. The bidder shall have to take an insurance policy against any material issued to him by the purchaser.
7. The fabrication work shall be subject to inspection by our engineer.
8. The bidder shall complete the work within 60 days from the date the firm work order is issued to the bidder. Installation will be done at M-34, PRIP Shed, Near Engg.Hall-8, BARC, Trombay, Mumbai-400 085.
9. Head, Laser & Plasma Technology Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.

Yours faithfully,

[Signature]

Head, Thermal Plasma Technology Section

Encl.: As above.

Copy to: Accounts Officer, G.S.S. The quotations will be opened at 3.00 PM. on 04/09/2020
Annexure-D

Detail Drawings and Specifications of Plasma Spheroidization System

The drawing is the property of Thermal Plasma Technology Section of Laser and Plasma Technology Division, BARC, Trombay, Mumbai-85, Govt. Of India. This must not be copied or reproduced in any manner or design disclosed or parts manufactured without written permission.
Annexure-D

1. Justification and Scope of work:

This work contract is for fabrication and supply of a double walled water cooled cylindrical plasma spheroidization chamber as per the design and specifications provided in this Annexure. A complete list of the jobs to be carried out is specified below. Drawings and dimensions are provided only for proper estimation of price for the components to be fabricated. Overall scheme of the complete unit is provided for understanding complexity of the job and estimation of total cost. All dimensions are in mm. Necessary details for fabrication of each component will be provided only when the work order is issued. The drawing provided may be subject to minor modification (5% or less) based on availability of device, technology and material without affecting the process by any means. It remains clarified that it is responsibility of the vendor to prepare the final fabrication drawing for the complete job, get it approved by executing officer before any fabrication starts and handing over the final Autocad drawing to the Indentor. The final drawing is the property of L&PTD, BARC. This must not be copied or reproduced in any manner or design disclosed or parts manufactured thereof without written permission. Being an R&D work, it also remains clarified that the vendor will incorporate the said modification in the design, if any, without any additional charges, upon written request from the executing officer. The vendor will keep records of all details at all stages of fabrication and will produce the same as and when demanded by the executing officer. It is responsibility of the vendor to clarify the details and doubts regarding the job (if any) before the fabrication starts. Work shall be carried out as per the Indian Standards and Code of Practices. In absence, latest issue of International Standards shall be followed. All welding must be done by certified welders. Welder certificates and DP test reports need to be provided before fabrication starts. Any discrepancies/conflict found shall be immediately brought to the notice of the Executing Officer for his direction/approval. While quoting, the bidder must provide breakup of the total cost.

2. Specifications and Scope of Work

2.1 General specifications:

The double walled water cooled plasma spheroidization chamber has three sections: (1) Cylindrical top part with water cooled top flange for mounting of the plasma torch (2) Cylindrical middle section for tailoring the flow affected zone, and (3) Cylindrical lower section attached with an easily removable collection pot. All the three parts will be manufactured separately as per the design and dimensions mentioned in this document. They will be integrated at site with appropriate O-rings for inter-chamber sealing through tightening of the associated flanges using nuts and bolts. While the top part will have two line of sight view ports 180 degree apart for plasma diagnostics, the middle part will have similar two view ports opposite to each other but at different heights. The bottom section will have only one view port for which the details are provided. This section is attached with a powder collection pot at the bottom using toggle clamps for easy removal and attachment and connected with an existing cyclone chamber slightly above the collection pot.
The scope of work does not include fabrication of the cyclone chamber and any of the items include in the process train after the cyclone chamber. It also remains clarified that fabrication of each and every component of the chamber up to the cyclone chamber port fall under scope of the vendor except the plasma torch and the SS piping joining the bottom chamber with the existing cyclone chamber and. The MS structural platform & support structure for mounding the chamber is excluded from the scope of the present work.

It also remains clarified that it is responsibility of the vendor to fabricate and facilitate arrangement for 50 numbers of one mm argon injection ports at the location of the joining flanges, uniformly distributed along the inner periphery of the cylinders, discharging downward tangentially along the inner wall at an angle of 45 degree with respect to vertical. The arrangement will act as argon brush at two vertical locations to prohibit deposition of powder on the inner wall of the chambers.

2.2. Scope of work

Complete scope of work under this work contract includes

(1) Fabrication and supply of cylindrical double walled water cooled SS 304 spherodization discharge chamber-1 with water cooled top flange for mounting of the plasma torch as per the drawings provided in section 2.3.
(2) Fabrication and supply of cylindrical double walled water cooled SS 304 spherodization discharge chamber-2 for tailoring the flow and heat affected zone as per the drawing provided in section 2.3.
(3) Fabrication and supply of cylindrical double walled water cooled SS 304 spherodization discharge chamber-3 attached with an easily removable collection pot at the bottom using toggle clamp.

Note: 1. Scope includes fabrications of all the view ports, thermocouple ports, SS flanges for interconnection of the chambers, viton O-rings, argon brush system at two heights, leak proof view ports with toughened glass, push fit couplings for water circulation, holding brackets & nut bolts as per the details and dimensions mentioned in the drawing in section 2.3.
2. Each of the double walled chambers will have SS spiral flow guide in between outer and inner cylinders for flow of chilled water.
2.3 Drawing of the components to be fabricated, overall assembly and orientation:

2.3.1 Overall layout of components of the plasma spheroidization system:
2.3.2 Gross dimensional details (All dimension in mm):
2.3.3 Details of double walled chambers, water cooled top flange, view ports and collection pots (All dimension in mm):

(a) Water cooled top flange, view port and torch mounting

(b) The collection pot

(c) Details of double walled chamber