

Government of India
Bhabha Atomic Research Centre
Accelerator Control Division

Ref : BARC/ACnD/17-18/696

Date : 9 Oct 2017

Sub : Fabrication, of solenoid magnetizing fixture

Dear Sirs,

- Quotations are invited for the minor fabrication job "Fabrication, of solenoid magnetizing fixture as per specification TSP/magfix
- Bidder shall quote for the machining and fabrication, with raw materials excluding the materials mentioned as purchaser free issue material referred in technical specification. Taxes, VAT and Excise Duties shall be quoted separately.
- The quotation must reach Head, ACnD by due date..... 9/11/17 FN and must be sent in a sealed envelope super scribed with the reference number & the due date given above. (by Indian/speed post only)
- The address on the envelop should read:

Head, Electromagnetic Applications Section
Accelerator Control Division,
BARC, Trombay,
Mumbai - 400 085.
(Kind Attn: P Trivedi)

- Any modification required during the fabrication process shall be made after approval from our engineer.
- The bidder shall complete the same within 1 month from the date of firm work order issued to the bidder.
- Head, ACnD reserves the rights to accept / reject any or all quotations without assigning any reason.
- Delivery charges if any must be clearly mentioned in the offer.
- Quotation must also indicate the validity of offer.
- Quotation should be submitted on printed format along with PAN, GST. The quotations received in computer-generated format and without PAN, GST, the quotation will be summarily rejected.
- For any clarification regarding specification please contact Praveen Trivedi SO/E ACnD phone- 022-25593477, praveent@barc.gov.in
- Encl.: Technical specification : TSP/magfix (Annexure-B)


9.10.17

Head EMAS

Annexure-B

TSP/magfix

Technical specification 30mm magnetizing fixture

1.0 SCOPE: - This tender document specifies the requirements for fabrication, machining, coil winding, epoxy potting, , testing, supply of solenoid magnetizing fixture ,. The development of the solenoid fixture shall be strictly carried out as per the specifications and standards details in this document. In this document, BARC shall be referred as purchaser and fabricator/company who will be executing job is mentioned as the supplier.

Supplier shall arrange all required raw material/ facilities as per the requirement for development of solenoid fixture. The supplier shall be qualified as per the Para 9.0. The brief description of contents of this tender specification document is as described below.

Para 2.0 gives the statement of purpose

Para 3.0 gives the deliverables

Para 4.0 gives the general description & requirements

Para 5.0 gives the engineering requirements

Para 6.0 gives the requirements of manufacturing and workmanship

Para 7.0 gives the requirements of inspection and testing

Para8.0 gives the requirements of quality assurance

Para 9.0 gives the requirements of supplier qualifications

Para 10.0 gives the requirements of packaging and safe delivery

Para 11.0 gives the price and delivery schedule

Para 12.0 gives the confidentiality requirement

Para 13.0 drawing

Para14 General Conditions.

2.0 Statement of purpose: - The magnetizing fixture solenoid is required to generate a high pulsating field discharge used to deeply saturate unmagnetized magnets. The coils of the electromagnets are air cooled during normal operation.

3.0 Deliverables:-

S No.	Description	Qty
	Fabrication, machining, coil winding, epoxy potting, integration, testing, supply of magnetizing fixture solenoid	
1.	Epoxy molded Electromagnetic Coils-one no.	As per drawing and technical specifications..

The scope of the supplier includes:

- I. Preparation of manufacturing drawings based on engineering drawings provided by the purchaser. Approval shall be taken from the purchaser on the prepared manufacturing drawings before the start of fabrication. The supplier can however, make feasible changes but he should get it approved any changes made by purchaser.
- II. Purchase of raw material as per technical specification and produce test certificates for approval from purchaser before procuring.
- III. Magnet coil assembly as per technical specification below.

- IV. Coil support and fixing assembly is in scope of supplier. The Supplier should take approval of it with purchaser before implementations.
- V. Testing and Inspection of Coil assembly in presence of purchaser representative.
- VI. Packing of the coil packed in wooden suitcases and shipment of the same.

4.0 GENERAL DESCRIPTION AND REQUIREMENTS

4.0.1 Electromagnet consists of electromagnet core and electromagnetic air cooled coils

4.0.2 The air cooled coil is made up of high quality OF/ETP grade rectangular conductor. The copper conductor is to be procured by the supplier strictly as per specification in Annexure C . The copper conductors are wound on a glass fiber mandrel to form the coil and are epoxy impregnated to provide better mechanical strength. The electrical connections drawings and implementations lies in scope of Supplier. This is to be made with discussion with purchaser and implemented after purchaser approval.

4.0.3 The supplier shall work out a detailed design to meet fabrication requirements and work description, quantity and main fabrication material. He shall submit along with the offer dimensional drawing giving all the salient features, material details of individual items and assembly view of the fixtures.

4.0.4 The Supplier shall indicate in detail the standards adopted for the materials and processes and the quality control procedures followed by them.

4.0.5 Supplier can suggest the color, aesthetics, and other details as suitable. Supplier must offer best quality/IS certified material only.

4.0.6 Supplier should have similar work experience and along with the offer, shall submit the details of past experience with documentary proof.

4.0.7 Materials tools, manpower etc required for the above work will not be supplied by the user. Supplier has to arrange the above on his own.

4.0.8 The supplier shall incorporate minor changes in the design as required at the time of execution of work at no extra cost.

5.0 ENGINEERING REQUIREMENTS

The machining and core fabrication in complete is in scope of supplier.

6.0 Electromagnet Coil:

6.1 The electromagnet coil shall be made from high quality OF/ETP copper rectangular conductors.. The copper wire shall be of OFE /ETP grade and enameled for temperature class of 200(Dual coated).. The specification of electromagnet coil is provided in Annexure-C.. The complete coil fabrication is in scope of supplier as per drawings in annexure-D.

6.2 The purest form of copper for solenoid coil shall be purchased by the supplier. Once such conductor supplier is M/s KALAPURNA STEEL & ENGG PVT LTD Mumbai. The supplier is free to purchase the ETP/OF copper conductor, however the manufacture of conductor must be ISO certified and all the test certificates of the conductor along with its dimensional measurement shall be submitted to the purchaser before the use of it for the electromagnet coil.

6.3 Suitable care shall be taken during handling of the copper conductors The copper wire shall be wound on a collapsible bobbin/mandrel made up of G10 FRP. The bobbin must be collapsible and the side flanges of the bobbin shall be removed after winding and epoxy impregnation/moulding. The epoxy should be insulating Class H and of high thermal conducting. The supplier shall carry out the design of the bobbin.

6.4 Suitable jigs shall be developed to support the bobbin on a winding machine and carry out the winding of the coil on the G10 bobbin. The winding machine can be either machine controlled or manual controlled. However there shall be no overlap in the coils during winding and the complete winding will be inspected by the purchaser.

6.5 The complete coil shall be epoxy impregnated /moulded with clear epoxy. The mould for epoxy impregnation of the coil shall be developed by the supplier and the same shall inspected before carrying out epoxy impregnation.

6.6 Suitable length of copper shall be provided for termination and electrical connections.

6.7 The Electrical connections drawings of coil should be made by supplier and approval of it is sought from purchaser before implementations.

7.0 INSPECTION AND TESTING

7.1 At suppliers premises The Fixture should be tested by providing a DC current of 10A to fixture solenoid to generate minimum field at center of solenoid of value 200G with uniformity of field in magnet volume 25mm diameter 25mm height $\pm 0.5\%$ or better. The gauss meter to be arranged by supplier.

7.2 After the mechanical assembly of the fixture, the visual inspection to be done for clean and rigidness of fixture structure.

7.3 Electromagnet coil after impregnation:

Insulation resistance testing: The insulation resistance between the coil terminals and mandrel using minimum voltage of 1kV DC shall be measured and noted. It should be as per standards .

8.0 REQUIREMENT OF QUALITY ASSURANCES

8.1 Quality surveillance and expediting, relating to all the aspects of the contract will be carried out by the purchaser or his authorized representative for which purpose the supplier and his subcontractor shall

8.2 Allow access at all reasonable times during manufacture, assembly and testing to the premises in which the work is being carried out.

8.3 Furnish the latest drawings and/or tooling, gauges, instruments, testing equipment etc. required for inspecting the jobs. Prints of all the latest required drawings and approved procedures shall be made available for inspection and retention, if so desired.

8.4 Produce an inspection plan to the purchaser's satisfaction and notify when checkpoints on the plan are imminent so that the purchaser's representative may be present, if it is so desired.

8.5 Obtain acceptance of the components in the form of a shipping release from the purchaser's representative before the shipment.

8.6 The supplier shall be responsible for the inspection of the components that is subcontracted by him.

8.7 Waiving of quality surveillance by the purchaser's or acceptance of the items by the purchaser or his authorized agent, shall not relieve the supplier from the responsibility for supplying the items in accordance with specification requirements of this document and purchase order.

9.0 REQUIREMENT OF PACKAGING AND SAFE DELIVERY

9.1 Protective covers: Supplier shall make necessary arrangements for all components using a suitable PVC cover or moulded thermocol. Proper care should be taken while handling the component during fabrication, inspection, testing and packing.

9.2 Packaging: After completion of all testing and identifying the components, the components shall be packed suitably for shipment, so that no damage occurs in transit. The purchaser shall subject the packing procedure to prior approval. At least one copy of packing list shall be kept in the package for quick and easy verification.

10.0 REQUIREMENTS OF SUPPLIER QUALIFICATIONS

Suppliers will be qualified based on technical evaluation. As this is a multi-disciplinary work hence supplier must have technically qualified and trained staff for both mechanical and magnetics jobs. Supplier must have required infrastructure and past experience of similar jobs. Supplier will be evaluated based on the information provided by the supplier as requested below. Purchaser's specialists may visit the supplier facilities for evaluation and for detailed technical discussions.

S.No	Type of job	Outsourcing permissible (Yes/No)
1	Preparation of manufacturing drawings on the basis of engineering drawings provided by the purchaser.	No
2.	Outsourcing of winding	Yes

Purchaser's specialists may visit the supplier facilities for evaluation and for detailed technical discussions. Details to be furnished by the vendor related to facilities and expertise:

S.No	Particulars	To be filled by the vendor
1	Past experience The supplier shall give their past three year turn over and job executed by them with reference , volume of work and completion schedule , present commitments and anticipated commitments inside and outside India.The experience should be related to magnetic assembly and coil winding ..	
2	Sub Contract: Supplier shall list the jobs, which they want to sub-contract. They should also produce the list of sub-contractors and their infrastructures and facilities	

The bidder shall provide with the tender documents sufficient information for technical evaluation of the supplier. These shall include

A draft time schedule showing the manufacturing, testing of the coils

Bidder shall quote for a complete fabrication of fixture Incomplete offers will not be considered.

The bidder should have experience of fabrication of electromagnet assembly . He should have handful experience in design and development of solenoid fixtures. He should submit users list for whom he executed the orders for above.

A list of previous projects, similar or comparable in size and scope to assess the supplier's viability and ability to accomplish the job.

11 REQUIREMENTS OF PRICE AND DELIVERY SCHEDULE

11.1 The magnetizing fixture shall be delivered RCZ Stores BARC . The supplier shall give a lump-sum price with delivery schedule. The complete job is expected to be completed in a duration of 1 month .

12 CONFIDENTIALITY CLAUSE

12.1 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 disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to sub-contractors, consultants, advisors or the employees engaged by a party with equal force.

12.2 "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 the contractor will invite penal consequences under the aforesaid legislation.

12.3 Prohibition against the use of BARC's name without permission for publicity purpose.

12.4 The contractor or sub-contractors, consultants, advisors or the employees engaged by a party shall not use BARC's name for publicity purpose through any public media like: press, radio, TV or Internet without any prior approval of BARC (wide circular ref.: 2/Misc-9/Lgl/2001/92 date 30/04/2001)

13. List of Drawing:-

As per annexure-D

14 General conditions

- a. All intellectual property rights belong to purchaser for work done under this technical specification/PO.
- b. Supplier shall maintain the authenticity of drawings or any related drawings/document provided by the purchaser.
- c. All activities would normally be carried with due professional care. However, purchaser shall not be responsible for any loss or personnel accident during execution of the work pertaining to the technical specifications under this PO.
- d. Supplier agree to hold in confidence all information provided by the purchaser.
- e. Supplier shall collaborate and coordinate all the work sub-contracted to any vendor.
- g. All the raw materials required for deliverables except the Free Issue Material mentioned is in scope of supplier and the supplier should quote accordingly.
- h. Overall cost of all the items in the deliverables will be compared which will also include packaging, forwarding and safe delivery costs to BARC RCZ stores.
- i. Suppliers shall give complete details of their product & list of users for technical evaluation.
- j. Supplier shall submit along with the quotation, compliance certificate adhering to the specifications.

Annexure-C

Technical specification of Electromagnet Coil

S.No.	Description	Value
1	No of Coils	01
2	No of turns	840
3	Insulation class	Class H Modified
4	Insulation Thickness	0.1 mm
5	Copper Conductor	5x2mm OFE/ETP Copper Rectangular conductor

*****Effective R and L of fixture:- $L=884\mu H$; $R=75m\Omega$

COIL SPECIFICATION

COPPER CONDUCTOR : RECTANGULAR SHAPE 5x2 ETP/OF
INSULATION : H INSULATION CLASS
INSULATION THICKNESS : 0.100 MM
NO OF TURNS. : 840

Annexure-D

