

Government of India
Bhabha Atomic Research Centre
Electromagnetic Applications & Instrumentation Division

Ref: EmA&ID/EMAS/22/ 40184


Date: 18/04/22

Sub: Support for assembly, installation & testing of shield cooling plates on split coil superconducting magnet bobbin.

Dear Sir/Madam,

1. Quotations are invited for support for assembly, installation & testing of shield cooling plates on split coil superconducting magnet bobbin.
 2. Bidder shall quote for support for assembly, installation & testing of shield cooling plates on split coil superconducting magnet bobbin. There is no FIM.
 3. Taxes and Excise Duties shall be quoted separately. Form AF / H whichever is applicable shall be provided, if required.
 4. **The quotation must reach The Head, Electromagnetic Applications Section by 02nd May, 2022 and must be sent in a sealed envelope super scribed with the reference number & the due date given above.**
 5. **The quotations shall be sent only through registered post/speed post through Indian postal services.**
 6. The address on the envelop should read:

**The Head,
Electromagnetic Applications & Instrumentation Division,
BARC, Trombay,
Mumbai - 400 085.
(Kind Attn: Shri. Udai Giri Pratap Singh Sachan, SO/D)**
 7. The assembly & thermal conductivity testing shall be carried in the presence of our engineer. The material shall not be dispatched prior to approval by our engineer at bidder's premises. Necessary inspection facilities shall be provided to our engineer during fabrication at bidder's premises.
 8. The bidder shall deliver the finished components after approval by our engineer within 8 weeks from the date of firm work order issued to the bidder. The finished components shall be delivered by the bidder at **Electromagnetic Applications & Instrumentation Division, BARC, Trombay, Mumbai - 400 085.**
 9. Head, Electromagnetic Applications & Instrumentation division reserves the rights to accept / reject any or all quotations without assigning any reason.
 10. Delivery charges if any must be clearly mentioned in the offer. Quotation must also indicate the validity of offer. Quotation must also indicate the GST no and PAN no of the party.
 11. The quotation has to be signed by authorized person with company seal.
 12. Job should be guaranteed against material and manufacturing defects for 1year from the date of supply.
- Encl.: Technical Specification Sheet no:- EmA&ID/21/03 dated 30/09/2021


(Udai Giri Pratap Singh Sachan)
SO/D, EMAS, EmA&ID

Specification for Minor fabrication Work order

Specification no.	Revision no.	Date of Issue	No of pages
EmA&ID/21/01	0	05/04/2022	02

Support for assembly, installation & testing of shield cooling plates on split coil superconducting magnet bobbin

This specification specifies the requirements for support for assembly, installation & testing of main cooling plates on split coil magnet bobbin for 1.5 Tesla high uniformity magnets. Work shall be carried out strictly as per specifications as detailed in this document.

Supplier shall arrange required raw material/ facilities for manufacturing and testing. Supplier shall be qualified on the basis of technical evaluation. (Refer Para 9.0). The brief description of contents of this tender specification document is as described below.

Para 2.0 gives intended application and operating service conditions.

Para 3.0 gives the details of deliverables.

Para 4.0 gives the general description details.

Para 5.0 gives engineering requirements.

Para 6.0 gives the requirement of raw material procurement.

Para 7.0 gives the inspection and testing.

Para 8.0 gives the requirements of packaging and safe delivery.

Para 9.0 gives the requirements of supplier qualifications.

Para 10.0 gives the requirements of price and delivery schedule.

2.0 INTENDED APPLICATION AND OPERATING SERVICE CONDITIONS

1.5 Tesla superconducting magnet is proposed to be installed in the ground floor. Main cooling plate is of 8 mm thickness OFHC copper plate having size of 280 mm x 350mm. The cooling plates are required to transfer cold to the magnet coil by using internal copper bridges.

3.0 GENERAL DESCRIPTION

3.1 The superconducting magnet is cooled with the help of close cycle GM/PT cryocoolers. These cryocoolers remove the heat as per Fourier law of conducting.

3.2 The magnet consists of 10 cooling coils. Each cooling coil has internal as well as external thermal bridges for efficient cooling. The bridges are made of 3 mm thick high RRR OFHC copper.

3.3 The bridges are moulded into C-cups to compensate thermal contractions during cool down.

3.4 The main cooling plate is connected to pulse tube cryocooler extenders. Four sub systems are also housed on the cooling plates. Shield coil, main coil, instrumentation wirings are also carried out on the top of the main cooling plates.

3.5 Thermoelectric switches along with joints are also located on the top of the cooling plates.

3.6 Shield cooling plates and QPS system also needs to be interconnected.

3.7 The drawings of the complete systems shall be shared during work execution after awarding of the contract.

Uday Giri

4.0 ENGINEERING REQUIREMENTS APPROACH

4.1 All the machining and hole drilling operations has to be carried out in the defined tolerances as mentioned in the drawing. OFHC copper plates has to be procured by the supplier for carrying out machining operations

4.2 Cleanliness

4.2.1 Cleanliness shall be maintained while fabrication and cabling layout.

5.0 RAW MATERIAL PROCUREMENT

The following materials shall be used

5.1 OFHC copper plate with material certificate

6.0 INSPECTION AND TESTING

6.1 After assembly and installation of cooling plates same shall be inspected on CMM. The assembly tolerances should be within 100 microns as defined by engineering drawings.

7.0 REQUIREMENT OF PACKAGING AND SAFE DELIVERY

7.1 The finish component shall be packed carefully before dispatch. Utmost care shall be taken during cable handling.

7.2 **Protective covers:** Supplier shall make necessary arrangements for all components using a suitable PVC cover or moulded thermocol. Connectors shall be provided extra cushioning during transportation.

8.0 REQUIREMENTS OF SUPPLIER QUALIFICATIONS

8.1 **Infrastructure:** The supplier must give the details of infrastructure suitable for this job such as Manufacturing Machines, soldering station, crimping tools, qualified technicians etc.

8.2 **Past experience:** The supplier must give their past three-year turnover and job executed by them with reference, volume of work and completion schedule, present commitments and anticipated commitments inside and outside India.

9.0 REQUIREMENTS OF PRICE AND DELIVERY SCHEDULE

10.1 The supplier shall provide overall cost with delivery schedule. The assembly and testing activity shall be completed in 4 months.

Uday Guri