अंतर विश्वविद्यालय त्वरक केंद्र-

INTER-UNIVERSITY ACCELERATOR CENTRE

(विश्वविद्यालय अनुदान आयोग का स्वायत्त निकाय)

(An Autonomous Centre of UGC)

अरुणा आसफ अली मार्ग 110067-नई दिल्ली ,

Aruna Asaf Ali Marg, New Delhi - 110067

ई-निविदा आमंत्रण सूचना/ NOTICE INVITING E-TENDER

निविदा संख्या/एनआईटी/आईयूएसी :-09/GOR/2024-25 **दिनांक: 14/08/2024**

Tender Number: IUAC/NIT/09/GOR /2024-25 **Dated: 14/08/2024**

अंतरआई) विश्वविद्यालय त्वरक केंद्र-.यू.ए.सी. अनुभवी पार्टियों से दो बोली/पात्र (प्रोक्योरमेंट पोर्टल के-तकनीकी और वित्तीय बोली के तहत ई :प्रणाली नामत ,माध्यम से निदेशकअविश्वविद्यालय त्वरक केंद्र "अनुलग्नक ए के अनुसार माउंटिंग संरचना के साथ एक एच-डिपोल वाटर-कूल्ड, डीसी इलेक्ट्रोमैग्नेट का निर्माण, मशीनिंग, कॉइल वाइंडिंग, एपॉक्सी संसेचन, एकीकरण, परीक्षण आपूर्ति" के लिए ऑनलाइन बोलियां आमंत्रित करता है।

Inter - University Accelerator Centre (IUAC) invites online bids on behalf of the Director IUAC, New Delhi through e-procurement Portal under two bid system, viz., Technical and Financial bids, from eligible / experienced parties for the supply of **"Fabrication, machining, coil winding, epoxy impregnation, integration, testing and supply of one H-Dipole water-cooled, DC electromagnet with mounting structure as per Annexure A".**

निविदा दस्तावेज, सेंट्रल पब्लिक प्रोक्योरमेंट पोर्टल (सीपीपी) https://eprocure.gov.in/eprocure/app से मुफ्त में डाउनलोड किए जा सकते हैं। इच्छुक बोलीदातापंजीकरण नहीं किया है/प्रोक्योरमेंट पोर्टल में नामांकन-जिन्होंने ई ,, उन्हें भाग लेने से पहले https://eprocure.gov.in/eprocure/app वेबसाइट के माध्यम से

नामांकन पंजीकरण करना होगा।/बोलियां केवल https://eprocure.gov.in/eprocure/app वेबसाइट पर ऑनलाइन जमा करनी होगी। निविदाकारों बोलीदाताओं को/ठेकेदारों/ प्रोक्योरमें-सलाह दी जाती है कि वे ईट पोर्टल में दिए गए निर्देशों का पालन करें। बोली दस्तावेजों को डी 100.पी.आई. में ब्लैक एंड व्हाइट स्कैन करें जो स्कैन, किए गए दस्तावेजों के आकार को कम करने में मदद करता है।

Tender Documents may be downloaded from Central Public Procurement (CPP) Portal free of cost https://eprocure.gov.in/eprocure/app. Aspiring Bidders who have not enrolled/registered in e-procurement portal should enroll/register before participating through the website https**://eprocure.gov.in/eprocure/app**. Bids should be submitted online only at website: **https://eprocure.gov.in/eprocure/app**. Tenderers / Contractors / Bidders are advised to follow the instructions provided in the e-procurement portal. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned documents.

केवल ईप्रोक्योरमेंट पोर्टल के माध्यम से प्राप्त बोलियों को-ही खोला जाएगा। जो बोलियाँ उत्पादों आपूर्ति/वस्तुओं के कार्य/के वांछित प्रयोजनों को संपूर्ण रूप से पूर्ण करने में अक्षम होगीउन, बोलियों को अस्वीकार कर दिया जाएगा और केवल पूर्ण बोलियों पर विचार किया जाएगा। अंतरविश्वविद्यालय त्वरक केंद्र-के पास बिना कोई कारण बताए किसी भी पूर्ण रूप/सभी निविदाओं को आंशिक/ अस्वीकार करने का अधिकार सुरक्षित है और इस संबं/से स्वीकारध में आईयूएसी का निर्णय सभी बोलीदाताओं के लिए बाध्यकारी होगा।

Only bids received through e-procurement portal will be considered for opening. Bids not covering full scope of work/supply of the products/goods will be rejected and only complete bids will be considered. IUAC reserves the right to accept / reject any / all tenders in part / full without assigning any reasons whatsoever, and the decision of IUAC in this regard will be binding on all the bidders.

ई.डी.एम. का भुगतान करने के लिए बोलीदाता को भुगतान विकल्प "ऑनलाइन" जो ,का चयन करना होगा https://services.sabpaisa.in/pages/iuac.html लिंक पर जाकर लागू होगा। बयाना राशि ऑनलाइन भुगतान के रूप में होगी और इसे बोली खोलने से पहले जमा किया जाना चाहिए। एम.एस.एम.ई.एन/.एस.आई.सी. में पंजीकृत बोलीदाताओं को ई.डी.एम. के भुगतान से छूट दी गई है। तथापि, उन्हें

बोली सुरक्षा घोषणा प्रपत्र जमा करना होगा। एम.एस.एम.ई.एन/.एस.आई.सी.(कार्य के लिए पंजीकृत इकाई/निविदा की गई वस्तु) से पंजीकृत निविदाकारों को तकनीकी बोली के साथ वैध पंजीकरण प्रमाणपत्र की प्रतिhttps://eprocure.gov.in/eprocure/app वेबसाइट पर अपलोड करनी होगी।

Bidder has to select the payment option as "online" to pay the EMD as applicable by going to the link **https://services.sabpaisa.in/pages/iuac.html** . The Earnest Money Deposit shall be in the form of online payment and it should be deposited before the bid opening. Bidders registered with MSME/ NSIC are exempted from payments of EMD. However, they have to submit Bid Security Declaration Form. Tenderers registered with MSME/NSIC (the unit being registered for the item/work tendered) are required to upload copy of valid registration certificate in the website https://eprocure.gov.in/eprocure/app along with technical bid.

बोलीदाताओं को इस बात को विशेष ध्यान में रखने की सलाह दी जाती है कि वे अनिवार्य रूप से उपलब्ध कराए गए प्रारूप में ही अपनी वित्तीय बोलियां जमा करें और कोई अन्य प्रारूप स्वीकार्य नहीं होगा। यदि मूल्य बोली निविदा दस्तावेज के साथ मानक .XLS BOQ प्रारूप के रूप में दी गई है, तो इसेही डाउनलोड करना होगा और प्रारूप को संशोधित किए बिना ऑनलाइन भरना और जमा करना होगा। यदि बोलीदाता द्वारा BOQ फाइल को संशोधित पाया जाता है, तो बोली को अस्वीकार कर दिया जाएगा।

Bidders are advised to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard .XLS BOQ Format with the tender document, then the same is to be downloaded and to be filled and submitted online without modifying the format. **If the BOQ file is found to be modified by the bidder, the bid will be rejected**.

उपरोक्त निविदा के संबंध में कोई भी शुद्धिपत्र संशोधन केवल/https://eprocure.gov.in और www.iuac.res.in वेबसाइट पर जारी किया जाएगा। बोलीदाता ,अपनी बोली जमा करने से पहले निविदा दस्तावेज से संबंधित, प्रकाशित होने वाले किसी भी शुद्धिपत्र की जानकारी रखें। निदेशक, अंतरविश्वविद्यालय त्वरक केंद्र- के पास बिना कोई कारण बताए किसी भी पूर्ण रूप से/सभी निविदाओं को आंशिक/ अस्वीकार करने का अधिकार सुरक्षित है।/स्वीकार

Any Corrigendum / Amendments in respect of above tender shall be issued on website https://eprocure.gov.in and www.iuac.res.in only. Bidders should take into account any corrigendum

published on the tender document before submitting their bids. The Director, IUAC reserves the right to accept/reject any/all tenders in part/full without assigning any reasons thereof.

INSTRUCTIONS TO BIDDERS

REGISTRATION PROCESS ON CPP PORTAL FOR ONLINE BIDDING

1 Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: https://eprocure.gov.in/eprocure/app) by clicking on the link "**Online Bidder Enrolment**" on the CPP Portal which is free of charge.
Bidder who registered already may skip the registration process and login to site through their user ID/Password

2 As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.

3 Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.

4 Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g., Sify / nCode / eMudhra/ Nic etc.), with their profile.

5 Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.

6 Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

1 There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.

2 Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.

3 The bidder should make a note of the unique Tender ID assigned to each tender; in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1 Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.

2 Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.

3 To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GST Certificate etc.) has been provided to the bidders. Bidders can use "My Space" or ''Other Important Documents'' area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: Bidder should take into account any corrigendum published on the tender document before submitting their bids.

INSTRUCTIONS FOR SUBMISSION OF BIDS

1. The tender documents are available on our website www.iuac.res.in **& www.eprocure.gov.in.**

2. Tender documents may be downloaded from IUAC's website www.iuac.res.in and CPPP site https://eprocure.gov.in/eprocure/app as per the schedule as given in the tender document.

3. The tender shall be submitted online in two parts, on CPPP site, viz., technical bid and Financial (price Bid) bid.

4. The offers submitted by hand/Post/Fax/email shall not be considered. No correspondence will be entertained in this matter.

5. All the pages of bid being submitted must be sequentially numbered by the bidder irrespective of nature and content of the documents before uploading.

6. The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

7. Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e., on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

8. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.

9. Bidders are requested to note that they should necessarily submit their financial (price Bid) bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.

10. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

11. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128-bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

12. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

13. Upon the successful and timely submission of bids (i.e., after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

14. The bid summary has to be printed and kept as an acknowledgment of the submission of the bid. This acknowledgment may be used as an entry pass for any bid opening meetings.

15. Not more than one tender shall be submitted by one contractor or contractors having business relationship. Under no circumstance will father and his son(s) or other close relations who have business relationship with one another (i.e., when one or more partner(s)/director(s) are common) be allowed to tender for the same contract as separate competitors. A breach of this condition will render the tenders of both parties liable to rejection.

16. The bidders are advised to visit CPPP website https://eprocure.gov.in/eprocure/app at least 3 days prior to closing date of submission of tender for any corrigendum / addendum/ amendment.

17. Bids will be opened as per date/time as mentioned in the **Tender Document.** After online opening and evaluation of technical bids, the results of their qualification as well Price-Bid opening will be intimated.

18. Submission of a tender by a tenderer implies that he has read all the stipulations contained in this tender document and has acquainted him of the nature, scope and specifications of the items to be followed.

19. The tenderer shall submit all documents after duly filling the same in all respects. Tenders which are found to be vague or incomplete shall be rejected summarily.

20. Tenders shall be submitted ON-LINE; it shall be signed by one who has been authorized by the board of director /director / manufacture/ firm owner /their authorized agents through a resolution/ authority letter. Copy of the resolution/ authority letter in favor of the person signing must accompany the tender.

21. Tenders containing erasures and alterations of the tender documents are liable to be rejected unless these are authenticated by the person signing the Tender Documents.

22. **Code of Integrity for Public Procurement**

IUAC requires that the bidders, suppliers and contractors observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy, the following are defined:

Sr. No.	Term	Meaning
(a)	**Corrupt practice**	The offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution.
(b)	**Fraudulent practice**	a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract.
(c)	**Collusive practice**	means a scheme or arrangement between two or more bidders, with or without the knowledge of the purchaser, designed to establish bid prices at artificial, non-competitive levels.
(d)	**Coercive practice**	means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of a contract.
(e)	**Anti-competitive practice**	any collusion, bid rigging or anti-competitive arrangement, or any other practice coming under the purview of the Competition Act, 2002, between two or more bidders, with or without the knowledge of the purchaser, that may impair the transparency, fairness and the progress of the procurement process or to establish bid prices at artificial, non-competitive levels
(f)	**Conflict of interest**	participation by a bidding firm or any of its affiliates that are either involved in the consultancy contract to which this procurement is linked; or if they are part of more than one bid in the procurement; or if the bidding firm or their personnel have relationships or financial or business transactions with any official of purchaser who are directly or indirectly related to tender or execution process of contract; or improper use of information obtained by the (prospective) bidder from the

		purchaser with an intent to gain unfair advantage in the procurement process or for personal gain
(g)	**Obstructive Practice**	materially impede the purchaser's investigation into allegations of one or more of the above mentioned prohibited practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding the purchaser's Entity's rights of audit or access to information.

ASSISTANCE TO BIDDERS

1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the contact person, herewith Administrative Officer (S&P) as indicated in the tender.

2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Help desk. The contact number for the help desk is 1800 3070 2232.

E - TENDER DOCUMENT

Name of Work / Supply	Supply of **"Fabrication, machining, coil winding, epoxy impregnation, integration, testing and supply of one H-Dipole water-cooled, DC electromagnet with mounting structure as per Annexure A" at IUAC, New Delhi.**
Tender Number	IUAC/NIT/09/GOR/2024-25
Tender Value / Estimate only	Rs. 50,00,000/- (Fifty lakhs)
Earnest Money Deposit	Rs. 1,00,000/- (One lakh)
Tender Document Fee	NIL
Bid Submission End Date and Time (Part - A and Part - B)	03/09/2024 at 3.00 pm
Technical Bid Opening Date (Part - A)	04/09/2024 at 3.30 pm
Price Bid Opening Date (Part - B)	To be intimated later on to the technically qualified bidders
Mandatory Minimum Local Content	*1) 50% for Class I Supplier* *2) 20% for Class II Supplier*
Margin of Purchase Preference for Local Content	*20% (Pl. refer to the DPIIT Order mentioned at T& No. 15)*
Contact Person	a) Administrative Officer (S&P) / Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi 110067 E-mail: iuacstores@gmail.com Phone: 011-24126018, 24126022. b)Dr.G.Rodrigues (Scientist H) Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi 110067 E-mail: gerry@iuac.res.in Phone: 011-24126018, 24126022

General Terms and Conditions of the Tender:

1. **Submission of Tender**:

   Tenders should be uploaded on CPP Portal in two parts, i.e., Technical Bid (Part - A) and Price Bid / BOQ (Part - B).

2. **Technical Bid (Part - A)**:

   Prequalification of the bidder

(i) The bidder **should be** an indigenous supplier only. The original manufacturers (OM) or their authorized representatives quoting on behalf of original manufacturers are eligible to participate in the bid. The authorized representative has to submit a copy of valid authorization certificate from the original manufacturer at the time of bid, otherwise their offer is liable for rejection.

(ii) A supplier who has supplied iron core electromagnets or machined iron cores/poles for the electromagnets to any particle accelerator laboratory /reputed research laboratory/reputed experimental facility in India are eligible to quote. The documentary evidence(s) as proof of the same shall be attached along with the offer, otherwise their offer is liable for rejection.

(iii) Bidder/manufacture shall have sufficient resources required for design/design verification, drafting, assembly, and inspection facilities for the job as mentioned in the technical specification. Above mentioned activities shall not be outsourced. Documentary support indicating the capability for the same shall be submitted along with the bid otherwise the offer is liable for rejection.

(iv) If outsourcing of activities other than those mentioned in serial no. iii above are to be done, the details of the same shall be clearly mentioned in the offer. However, the overall responsibility of meeting the technical requirements and the time schedule will solely lie with the manufacturer/ bidder.

(v) In case of any manufacturing defect or failure of the system during warranty period which is valid from date of acceptance at IUAC, New Delhi and valid for a period of 18 months , the replacement of the same should be provided by the vendor free of cost.

No deviations in respect of NIT conditions are acceptable. In this bid, the bidder should upload the following documents:

1. Technical specifications / datasheets / user manual of the product indicating its ability to meet the technical specifications laid down in **Annexure A** of this NIT.
2. Tender Acceptance Letter (written on company letter head, duly signed and stamped.) as per format provided in **Annexure B**, as a token of acceptance of the NIT conditions, with this bid.
3. Profile of the Tenderer as per **Annexure C**.
4. Code of Integrity & Conflict of Interest undertaking on letter head as per **Annexure D**.
5. Certificate/ Undertaking for site visit (if applicable) **Annexure E**

6. Undertaking by the bidder as per **Annexure F**. The bidder should not be blacklisted by any Government, or Government Department, whether in the Central/State/District levels across India.
7. Declaration of local content as per **Annexure G**.
8. Check list for pre-qualification Bid as per **Annexure H.**
9. The Compliance form duly filled confirming the technical requirements of the product as per **Annexure-I**.
10. Proof of Earnest Money Deposit & MSME have to submit Bid Securing Declaration in lieu of EMD/Bid Security as per **Annexure J**.
11. Check point list-**Annexure -K**
12. Magnet drawings- **Annexure-L**
13. Authorized Distribution Certificate with a valid authorization from the OEM / undertaking on letter head about authorized distributorship for the tendered items in India should be provided.
14. **Proof of delivery of electromagnets to any government, particle accelerator laboratories and experimental facilities in India in the form of One copy of successfully executed purchase order value more than 80% of the estimated value Rs 40,00,000/- (Rupees Forty lacs) or two copy of order value each of 50% of the estimated value Rs 25,00,000/- (Rupees Twenty five Lacs) or three copies of order value each of 40% of the estimated value Rs 20,00,000/- (Rupees Twenty Lacs) for the supply of similar kind of items in the last 5 years.**
15. Copies of previous five financial years (2019-20,2020-21,2021-22, 2022-23 & 2023-24) Income Tax Return (ITR).
16. Average annual turnover during the last five financial years ending 31st March, 2024, (2019-20,2020-21,2021-22, 2022-23 & 2023-24) shall be at least Rs. 1.25 Crores. Duly audited financial statement/balance sheet/certified by CA to be submitted as supporting documents.
17. Self- attested copies of GST registration and PAN number.

***Technical bids which are not conforming to the technical specifications will be disqualified*.**

3. **Price Bid / BOQ (Part - B)**:

In this bid, the bidder is required to quote unconditional rates in the .XLS BOQ format provided with this tender. Quotes in INR will only be accepted.

The Indigenous suppliers quoting in INR should quote the rates all-inclusive **up to IUAC, New Delhi** and including GST. The BOQ file must not be modified.

4. **Bid Opening and Evaluation of Bids**

Opening of Bids:

a. The E-bids shall be opened on-line. The technical bids will be evaluated to shortlist the eligible bidders. The technical bids of only eligible bidders shall be considered for further processing.

b. Bidder whose technical bid is found to be acceptable and meeting the eligibility requirements as specified in this tender will be considered as technically qualified and IUAC will inform to the

qualified vendor.

c. IUAC will open commercial bids of only the technically qualified/short-listed bids.

d. In case, the day of bid opening is declared a holiday by the government, the E-bids will be opened on the next working day at the same time. No separate intimation shall be sent to the bidders in this regard

e. Since E-bid is an online process, the E-bid opening or any other process may be delayed due to any technical/server issue. If any such issue arises, this will not be tantamount to process delay and IUAC will not be responsible for the same.

f. On opening of bids online, accepting the bid would not mean that the firm is technically or financially qualified.

4. Clarification of Bids and shortfall documents

(a) During the evaluation of Techno commercial or Financial Bids, Indentor on behalf of IUAC may, at its discretion, but without any obligation to do so, ask Bidder to clarify its bid by a specified date. Bidder should answer the clarification within that specified date (or, if not specified, 7 days from the date of receipt of such request). The request for clarification shall be submitted in writing or electronically and no change in prices or substance of the bid shall be sought, offered or permitted that may grant any undue advantage to such bidder.

(b) IUAC reserves its right to, but without any obligation to do so, to seek any shortfall information / documents only in case of historical documents which pre-existed at the time of the tender opening, and which have not undergone changes since then and does not grant any undue advantage to any bidder.

5. **Earnest Money Deposit:**

EMD @ 2% of total estimate value Rs 1,00,000 (Rupees One Lac) is payable by the bidder. Bidder has to select the payment option as **"online" to pay the EMD as applicable by going to the link https://services.sabpaisa.in/pages/iuac.html**. The Earnest Money Deposit shall be in the form of online payment and it should be deposited before the bid opening. Bid Security shall be refunded to the un-successful bidders on award of contract and to successful bidders on receipt of Performance Security.

EMD is the mandatory requirement however the MSMEs/NSIC registered with Government Agencies are exempted from payment of Earnest Money Deposit (EMD) and are required to submit Bid Security Declaration form subject to conditions given below: -

i) MSMEs participating in the tender must submit valid & authorized copy of certificate of registration. The MSME's Bidder to note and ensure that nature of services and goods/items manufactured mentioned in MSME's certificate matches with the nature of the services and goods /items to be supplied as per Tender.

ii) The registration certificate issued by agencies must be valid as on Bid closing date of the tender. Bidder shall ensure validity of registration certificate in case bid closing date is extended.

iii) The MSMEs who have applied for registration or renewal of registration with any of the authorized agencies / bodies but have not obtained the valid certificate as on close date of the tender, are not eligible for exemption / preference.

6. **Validity of Tender**:

The rates quoted in the tender shall hold good for one year from the date of opening of the price bid. The validity of the rates is extendable for a period of 180 days from the date of issue of award letter with mutual consent of both the parties. No tenderer on his own withdraws or revokes the tender or revises or alters or modifies the tender for any item or condition within a period of aforesaid period of 90 days. No escalation of cost will be acceptable in any condition after order has been placed to the concerned party.

7. **Escalation / Deviation**:

No escalation or deviation shall be allowed till execution of order / contract.

8. **Performance Security**:

The supplier shall require to submit the Performance Security within 15 days on issue of LOI in the form of irrevocable bank guarantee or FDR issued by any Indian Nationalized Bank for an amount which is 5 % of the contract value from the date of receipt of the purchase order and will be returned after successful delivery at IUAC, New Delhi.

Testing and Demonstration: -

The equipment should be supplied as per specifications and conditions in this tender. A team of experts constituted by IUAC will further test the equipment for its stated performance in the presence of the vendor. **All testing equipment shall be arranged by the vendor at no extra cost.**

Test parameters to be confirmed at the factory are:

a) All mechanical dimensions as per specifications given in the drawing.
b) Pole gap and pole dimensions should be measured by CMM.
c) HV insulation tests of the coils as per specifications at vendor's site.
d) The excitation curve (measured magnetic field versus current) of the electromagnet should be measured from 0 to maximum current of 220 A (10% higher than the nominal value of 200 A) at a step of 10 A, keeping the Hall probe positioned in the median plane of the magnet, at the centre of the pole. This excitation curve should be recorded at each excitation level of the current and the measured magnetic field.
e) Field mapping in the median plane of the magnet should be carried out. Homogeneity of the magnetic field at different radial and angular positions w.r.t. the central field ($\delta B/B$) shall be measured and compared with the results obtained using simulations. Deviation in the parallelism of the pole faces, deviation in the horizontal positions of (top and bottom) pole centres beyond the limit of the tolerances would be directly reflected by the loss of symmetry in the measured data of the magnetic field on the either sides of. the pole centre. Homogeneity of $\delta B/B \sim 18 \times 10^{-3}$ over a radius of 120 mm of the pole is required as per design.
f) The working of the electromagnet as a whole should be confirmed.

9. **Terms of Payment**:

a) 95% of the payment shall be made after confirming the supply and testing at IUAC

b) Remaining 5 % will be paid after one year, defective liability period (DLP) of successful operation

c) The payment process will be initiated on submission of the bills by the bidder and after due certification by the concerned IUAC personnel.

d) All payments will be made after statutory deductions.

10. **Guarantee/Defect liability period**:

The supplied material should be guaranteed from manufacturing / engineering defect and bad material / workmanship for a minimum period of 12 months (1 year) from the date of acceptance of the goods by IUAC. During this period if any replacement/ repairs/ rectification of any of the supplied item etc. is needed, the supplier shall do the same free of cost to IUAC. If the equipment/ part needs to be shipped to the service Centre for repair/rectification during the guarantee period, the shipment charges should be borne by the supplier. The supplier shall guarantee that all equipment shall work satisfactorily and that the performance and efficiency of the equipment shall not be less than the specified values.

11. **Timeline for supply:**

The complete electromagnet should be supplied within 150 days from the date of issue of Purchase order. Any delay in completion of the work/supply due to reasons attributable to the vendor / manufacturer is liable to liquidated damages as per Clause 12 of this NIT. However, under the force-majeure conditions as per clause 13 of this NIT, IUAC may grant suitable time extension for which vendor has to request along with the justification / reasons well in advance to the Director, IUAC for approval without any prejudice or price escalation.

12. **Liquidated damages:**

In case the delivery of the listed items is delayed beyond the specified delivery period of 150 days for reasons attributable to the supplier, deductions on account of liquidated damages @ 0.5% per week subject to maximum of 5 % of the total order value will be deducted. Delivery period clause: within 120 working days from the date of final approval of drawings and design report.

13. **Force Majeure:**

IUAC may grant an extension of time limit set for the supply items in case it is delayed by force majeure beyond the supplier's control. Force majeure is defined an event of effect that cannot reasonably be anticipated such as acts of God (like earthquakes, floods, tsunami etc.), the direct and indirect consequences of wars (declared or undeclared), national emergencies, pandemics/epidemics, civil commotions and strikes (only those which exceeds a duration of ten continuous days) at successful Tenderer's factory. Apart from the extension of the time limit, force majeure does not entitle the successful tenderer to any relaxation or to any compensation of damage or loss suffered. The decision of the Director, IUAC will be final and binding for the bidder.

14. **Preference to make in India**

It is mandatory for bidders to quote items having local content minimum 20%. Refer revised Public Procurement (Preference to Make in India), Order 2017, No. P-45021/2/2017-PP (B.EII) dated 16.09.2020 issued by DPIIT, Ministry of Commerce and Industry, Govt. of India as notified from time to time. (Submit duly filled Declaration of Content as per Annexure G). The Declaration of Content once submitted in the Technical Bid will be final. Submission of Revised Declaration of Content will NOT be accepted.

As per O.M. of DPIIT, Ministry of Commerce and Industry, Govt. of India No. P-45021/102/2019- BE-II- Part (1) (E-50310) Dated 04.03.2021, Bidders offering Imported products will fall under the category of Non-Local Suppliers. They cannot claim themselves as Class-I or Class-II Local Suppliers by claiming the services such as Transportation, Insurance, Installation, Commissioning, Training and After Sale Service Support like AMC/ CMC etc. as Local Value Addition.

15. **Participation of IUAC Personnel:**

The IUAC personnel will witness and participate in the complete process of fabrication, testing and field mapping of the electromagnetic system at the vendors site.

16. **Final Acceptance:**

The final acceptance of the system is defined as successful supply, installation and acceptance tests at IUAC to substantiate compliance with the specification mentioned in Annexure A.

17. **Correspondence:**

All the correspondence in respect of tender / contractual obligation shall be made to The Administrative Officer (S&P) , Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi - 110067.

E-mail: iuacstores@gmail.com, Phone: +91-11-24126018, 24126022.

18. **Tender Rejection:**

(a) Director, IUAC reserves the right to accept/reject any/all tenders in part/full without assigning any reason whatsoever and the decision of the IUAC in this regard will be binding on all the bidders.

(b) Bids received by means other than e - procurement portal will be rejected.

(c) Only complete bids will be considered, and incomplete bids will be rejected.

(d) If BOQ file is found to be modified by the bidder, the bid will be rejected. Only INR quote will be acceptable.

(e) Tenders not complying with any of the provisions stated in this tender document are liable to be rejected.

(f) If the General Terms and conditions are not accepted and not signed by the bidders, then the tender will be rejected.

(g) Tender will be rejected on non-submission of 'Bid Security Declaration'.

19. **Negotiations**

Normally, there shall not be any negotiation. Negotiations, if at all, shall be an exception and only in the case of items with limited source of supply. Negotiations shall be held with the lowest evaluated responsive bidder. Counter offers tantamount to negotiations, shall be treated at par with negotiations as per GFR, 2017 rule.

20. **Termination for Insolvency**

IUAC may at any time terminate the Contract by giving written notice to the Supplier, if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the Purchaser.

21. **This notice inviting tender will form part of the contract agreement to be executed by the successful tenderer.The contract shall be governed by the Indian Laws. Any dispute arising out of this contract will be subjected to jurisdiction of New Delhi / Delhi only.**

Accepted (Signature of Bidder)

SPECIAL TERMS AND CONDITIONS OF CONTRACT

1.0 Carrying of work

All the work shall be carried out in accordance strictly as per the specifications given in the tender to the total satisfaction of IUAC, New Delhi.

2.0 Contractors/Supplier Responsibility for the manner of Execution of Work

The contractor/s/supplier shall be solely responsible for the manner and the method of executing the work. The work shall be subject to the approval of IUAC from time to time for purposes of determination of the question whether the work is executed by the contractor in accordance with the contract.

3.0 Specifications

During execution of work, the contractor/bidder should follow all standard norms of safety measures/precautions as per relevant codes to avoid accidents/damages to man, machines and buildings, at his own cost. If specifications for an item of work are not covered as per approved Specifications of tender, the same shall be decided by IUAC, New Delhi and shall be binding on the contractor.

4.0 Agency's Risk

All risks of loss of a or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the contract other than the excepted risks are the responsibility of the contractor /supplier.

5.0 Action and Compensation payable in case of Bad work

5.1 If it shall appear to IUAC, or our representatives, that any work has been executed with unsound, imperfect or unskillful workmanship **then the contractor/supplier shall be liable to replace/repair, free of cost.**

5.2 If during the execution of works, any damage is caused to IUAC property by contractor's/supplier's workers, contractor/supplier will duly make good the loss. IUAC has the right to make suitable deduction from contractor's/supplier's bills along with penalty, if contractor/supplier fails to make good the loss.

5.3 No material belonging to the contractor/supplier whether consumable or non-consumable should be brought inside the IUAC campus without proper entry at the Main Gate nor any material should be taken out without proper gate pass issued by the authorized representatives of IUAC, New Delhi. Material delivery challans duly entered at the main gate shall to be submitted. It shall always prevail, unless otherwise specifically stated, that the entire provisions of Tender document been opened upon and accepted for compliance by the contractor/supplier without any reservation.

6.0 During execution of work, the contractor/supplier should follow all standard norms of safety measures/precautions as per relevant codes to avoid accidents/damages to man, machines and buildings, at his own cost. Contractor/supplier will have his own arrangement to escort the labor to the nearest hospital for treatment in case any injury happens to any worker during execution of work.

Seal & Signature of Bidder/Bidder

Part A

Annexure-A

Technical Specifications of the DC Electromagnet

1. Introduction

Inter University Accelerator Centre, New Delhi is embarking on the development of an Indigenous Table Top Cyclotron Project. For this purpose, an H-shaped, DC electromagnet which is the heart of the cyclotron is required to be fabricated and tested by local vendors available within the country. In this tender document, related technical details of the said electromagnet is presented in detail as scope for the tendering process to be initiated.

2. Scope of the work

The scope of work covered in this tender involves manufacturing and supply of one (01) H-shaped electromagnet with mounting structure and one (01) spare pole shoe in accordance with the specifications, drawings and the other details as mentioned in this tender document. The procurement of all the materials e.g. soft irons for magnet yoke and poles, square hollow copper conductor for the coils and any other materials required for the manufacturing of the above electromagnet and its assembly with mounting structure and spare pole shoe shall be in the scope of the manufacturer. The scope of work also includes preparation of manufacturing drawings, inspection, testing, supply, and post supply testing of the electromagnet. Arrangement of all the necessary equipment and measuring instruments required for the testing of the magnet at the site of the manufacturer shall also be in the scope of the supplier. The purchaser reserves the right to include minor modifications in attached drawings at the time of placement of work order and the same should be included without any additional cost and/or the supplier shall incorporate minor changes in the design as required at the time of execution of work at no extra cost.

2. Bidder Qualification

- The bidder **should be** an indigenous supplier only. The original manufacturers (OM) or their authorized representatives quoting on behalf of original manufacturers are eligible to participate in the bid. The authorized representative has to submit a copy of valid authorization certificate from the original manufacturer at the time of bid, otherwise their offer is liable for rejection.
- A supplier who has supplied iron core, water cooled, DC electromagnets or machined iron cores/poles for the electromagnets to any particle accelerator laboratory /reputed research laboratory/reputed experimental facility in India are eligible to quote. The documentary evidence(s) as proof of the same shall be attached along with the offer, otherwise their offer is liable for rejection.
- Bidder/manufacture shall have sufficient resources required for design/design verification, drafting, assembly, and inspection facilities for the job as mentioned in the technical specification. Above mentioned activities shall not be outsourced. Documentary support indicating the capability for the same shall be submitted along with the bid otherwise the offer is liable for rejection.
- If outsourcing of activities other than those mentioned above are to be done, the details of the same shall be clearly mentioned in the offer. However, the overall responsibility of meeting the technical requirements and the time schedule will solely lie with the manufacturer/ bidder.

- In case of any manufacturing defect or failure of the system during warranty period which is valid from date of acceptance at IUAC, New Delhi and valid for a period of 12 months , the replacement of the same should be provided by the vendor free of cost.

3. Technical requirements:

The H-Dipole, DC Electromagnet is required to generate a magnetic field of 1.2 Tesla in the median plane of the electromagnet. The magnet must satisfy the following parameters as listed in Table-1. The H-dipole, DC electromagnet consists of soft iron core and water-cooled coil assemblies. All the sub-assemblies of the electromagnets are integrated through magnetic bolted assembly mechanism.

Table-1

Magnet data	
Parameter	**Value**
Magnetic Field	1.2 Tesla (at the median plane)
Pole gap	51±0.05 mm (Nominal)
Pole diameter	305 mm
Pole shoe	Removable
Field homogeneity at the median plane	better than 18 x10^{-3} up to radius of 120 mm (expected as per simulation)
Coil Data	
Parameter	**Value**
Total Magnetizing force(for two coils)	64800 Ampere-Turns
No. of coils	02 (Top and bottom)
No of turns per coil	162
Conductor size	10 mm x 10mm x 6 mm diameter bore (OF-OK oxygen free copper grade ASTM C10200)
Operating Current	200 A
Coil configuration	Double pancake
No. of double pancakes per coil	8
No of turns per double pancake	20 (except one double pancake per coil with 22 turns to make 162 turns per coil)

Cooling type	Low conductivity Water cooled
Inlet cooling water pressure	6 bar
Max Pressure drop per double pan cake	≤ 4
Water inlet temperature	20°C (Nominal)
Approximate mean diameter of coil	0.42 m
Approximate length of one double pan cake of 20 turns	26.5 m
Approximate total length of one coil	214.5 m
Approximate weight of one coil	135 Kg
Approximate resistance per coil	0.05 Ohm
Approximate operating voltage (for two coils)	20 V
Thermal sensors (cut-off value)	> 40^0 C (8 nos. of sensors to be mounted on each coil)
Interlocks	overload, high temperature cut-of
Yoke and pole material specification : As per section 3.1	
Copper conductor specification: As per section 3.2	

3.1 Fabrication of Iron core & yoke with desired soft iron properties and drawing list (Annexure L)

Applicable Drawings:

- ***(i) H-magnet , Drawing No. IUAC/CYCLO/01, sheet 1 of 1 (Annexure-L)***
- ***(ii) Magnet + stand, Drawing No. IUAC/CYCLO/02, sheet 1 of 1 (Annexure-L)***
- ***(iii) Stand, Drawing No. IUAC/CYCLO/03, sheet 1 of 1 (Annexure-L)***
- ***(iv) Top Yoke, Drawing No. IUAC/CYCLO/04, sheet 1 of 1 (Annexure-L)***
- ***(v) Bottom Yoke, Drawing No. IUAC/CYCLO/05, sheet 1 of 1 (Annexure-L)***
- ***(vi) Side Yoke-1, Drawing No. IUAC/CYCLO/06, sheet 1 of 1 (Annexure-L)***
- ***(vii) Side Yoke-2, Drawing No. IUAC/CYCLO/07, sheet 1 of 1 (Annexure-L)***
- ***(viii) Coil, Drawing No. IUAC/CYCLO/08, sheet 1 of 1 (Annexure-L)***
- ***(ix) Pole, Drawing No. IUAC/CYCLO/09, sheet 1 of 1 (Annexure-L)***
- ***(x) Pole Tip-1, Drawing No. IUAC/CYCLO/10, sheet 1 of 1 (Annexure-L)***
- ***(xi) Pole Tip-Spare, Drawing No. IUAC/CYCLO/11, sheet 1 of 1 (Annexure-L)***

Specifications of Yoke/Core and pole material : The DC electromagnet core parts are machined preferably from single solid piece of soft Iron, low carbon, high quality magnetic steel (e.g. AISI-1010 or its equivalent or better). Poles are preferably made from a single solid piece of the above soft iron material of round bar/plate (AISI-1010 or its equivalent or better). The material to be procured should have the following typical chemical composition, magnetic and mechanical properties as mentioned in table-2 to table-4.

Table-2: Typical Chemical Composition of the material

S.No.	Element	%	S.No.	Element	%
1.	C	≤ 0.1	4.	N	0.005
2.	Mn	≤ 0.450	5.	Balance : Iron	≥ 99.18
3.	Si	≤ 0.02			

Table-3: Magnetic Properties of the material

S.No	Parameter	Value
1	Maximum value of relative permeability	> 5000
2	Coercive Force	60 – 120 A/m
3	Saturation Induction	2.15 T
4	Density	7.86 g/cm³

Table-4: Typical Mechanical properties

S.No.	Property	Value
1.	Ultimate Tensile	≥ 250 MPa
2.	Yield Strength	≥ 120 MPa
3.	Young Modulus	≥ 200 GPa

The material supplier should provide (i) ultrasonic test report of supply material as per EN 10160 class S1/E1 or ASTM A578 or any applicable international standard and (ii) detailed recommendations for heat treatment (if any) of the supplied material in order to achieve the desired magnetic properties.

Below mentioned test certificates of the material shall be sent to IUAC for approval and the material shall be procured and utilized only after receiving the written approval from IUAC.

1. Chemical composition as per table-2
2. Magnetic properties of sample material as per table-3 with B vs H or B Vs μ_r (relative permeability). It must be evident from the sample report that the values as per table-3 are achievable.
3. Ultrasonic test report

3.2 Fabrication of coils with desired conductor properties and drawing list and (Annexure L)

3.3 *Applicable Drawings:*

(i) Coil , Drawing No. IUAC/CYCLO/08, sheet 1 of 1

Specification of hollow copper conductor:

The coils of the electromagnet shall be wound using hollow square copper conductor of size of 10 mm x 10mm x 6mm hole diameter.
This specification lists the requirements for the supply of Oxygen Free (Cu+Ag: 99.95% minimum) Copper Grade 2 (UNS No: C10200) or Cu-OF as designated in EN13601 hollow square conductor as per the typical properties as mentioned in table-5 to table-7, dimensions and conforming to the relevant ASTM or equivalent standards like EN13600/EN13601/EN13605 for use in making electromagnets with cooling by flowing Low Conductivity water.

Table-5 : Physical properties

Density kg/dm^3	Coefficient of linear expansion 1/K	Specific heat J/(kg x K)	Melting temperature °C
8.94	0.0000177	385	1083

Table-6: Mechanical properties – typical values

	Soft temper	Half-hard temper	Hard temper
Hardness HV	35 – 65 HV	70 – 95 HV	85 – 115 HV
Tensile strength	200 – 220 N/mm^2	250 – 350 N/mm^2	260 – 400 N/mm^2
0.2% yield strength	35 – 65 N/mm^2	180 – 280 N/mm^2	220 – 380 N/mm^2
Elongation	min. 40 %	min. 12 %	min. 5 %

Table-7: Electrical and thermal properties – typical values

Electrical conductivity	vol	% IACS *	min 100.6
	mass	%IACS	min 100.0
	MS/m		min 58.3
Electrical resistivity	vol	Ω mm^2/m	max 0.0171
	mass	Ω g/m^2	max 0.1532
Thermal conductivity (20 °C)	W / Km		390

* % IACS = International Annealed Copper Standard. The % IACS values are calculated as percentages of the standard value for annealed high conductivity copper as laid down by the International Electrotechnical Commission.

4.Manufacturing Procedures:

4.1 Electromagnet Core assembly:

- The DC electromagnet core assembly consist of core/yoke and pole which shall be machined to the required dimension and tolerance specified in the drawings (as mentioned in section 3.1).
- The cutting of plates and rods shall be carried out strictly using water jet/saw cutting. **Flame/plasma cutting is strictly prohibited.**
- The soft iron material consists of low carbon (< 0.1% by wt), low Sulphur and low phosphorous (refer table-2) . Therefore, following precautions shall be taken during machining.

  Turning - Sharply ground tools and carefully selected cutting data are particularly important, since in the case of incorrect selection, pure Iron tends to smearing. Adequate cooling and lubrication are also essential in order to preserve the tool and the work piece.

  Milling — In order to obtain a fine surface, cylindrical milling cutters with a suitable pitch angle should be selected. For cooling and lubrication, the same recommendations apply as for turning.

  Thread cutting — Normal cutting tools can be used for the production of individual threads.

  Drilling — A slightly lower free angle should be selected than for drilling normal steels. The cutting speed is approx. 24 m/min, the feed approx., 0.05 to 0.10 mm/rev.

- Any other mechanical process including non-cutting, forming or welding is not permitted. In case of necessity during fabrication, the required machining parameters shall be clearly indicated and prior approval shall be obtained from IUAC.
- After machining, the complete magnet assembly shall be integrated and assembled. After the assembly of yoke and final dimensional control checks, the yoke shall be protected against rust by painting (colour RAL 5010, Blue). No paint should be applied on yoke joining surfaces and threads. Apply only light oil or other rust preventative measures.
- Lifting lugs made up of MS steel shall be provided for lifting the complete magnet assembly along with the coils. Each lifting lugs shall be qualified for lifting 1500Kg.

4.2 Electromagnet Coil:

- The water cooled coils of the DC magnet shall be formed by stacking double pancakes.Each double pancakes will be wound using the hollow copper conductor of cross section **(10 mm x 10 mmx 6 mm** diameter hole). The specification of the conductor with typical properties and applicable drawings is given in section 3.2.

- The water-cooled coil is made of high-quality **Oxygen Free rectangular copper hollow conductors**. The copper conductors are wound on winding mandrel to form the coil and are epoxy impregnated to provide better mechanical strength. All the water-cooled coils of magnets will be inter-turn insulated with glass tape followed by epoxy-resin impregnation & encapsulation under vacuum. The thermal class of insulation is F Class (155 ^{o}C).

Glass Fibre Tapes:

Unvarnished Glass Fibre tapes, meant for electrical purposes, shall be used as primary insulation of the conductor. The quality of glass fibre tapes shall be as per following:

Comparable Standards: Indian: IS 5352 1999 or International: BS ENG 61067-1 1997

Thickness: at least 0.23 mm

The vendor shall produce the "test certificate/s" as per standard mentioned above, or , "certificate of conformity" from original manufacturer of glass fibre tapes as per above mentioned standard.

Epoxy for casting coils:

Epoxy resin system shall be used for casting the coils. The epoxy used should have good mechanical and electrical properties, as given table 8. below:

Table 8: Typical properties values of Cured resin

Sl No.	Properties	Unit	Value
i.	Flexural Strength	MPa	115
ii.	Impact Strength (Unnotched)	kJ/m^2	10
iii.	Compressive Strength	Mpa	135
iv.	Tensile Strength	Mpa	70
v.	Dielectric Strength at RT	Kv/mm	18
vi.	Volume resistivity at RT	Ohm.cm	$1X10^{14}$
vii.	Glass transition temperature	^0C	90
viii.	Thermal Class	class	Minimum "F"

The coils will work in high ionization radiation area. Total absorbed dose in coil shall be approximately 2 MGy in its lifetime of 10 years of operation. Epoxy resin should be able to sustain the above mentioned radiation dose. Technical data sheet of radiation dose rate for the offered epoxy should be provided to IUAC. The vendor must get approval from the purchaser prior to use of the epoxy.

Brass, if used for fabricating water connectors in the coil side shall be UNS C26000 grade.

Material for water header (manifold) shall be SS304/SS316. Any material used for fabrication of coil and is part of delivery but not mentioned in this specification must be documented and get approved by IUAC.

- A proper fixture has to be designed and fabricated by the fabricator for winding the pancake. A suitable coil winding table and proper straightening/tensioning arrangement should be used to wind the pancake. **The mandrel used for coil winding should be shipped along with the magnet to IUAC, New Delhi after due fabrication.**

- Before winding the pancake, the conductor shall be cleaned thoroughly to remove dust, oil grease etc.

- Special care shall be exercised at all stages of the coil fabrication in the handling of all the components, which shall be undertaken in a clean environment. All working surfaces shall be cleaned immediately prior to be used, and protective gloves shall be worn by all the staff involved.

- No joint in the conductor is allowed inside a pancake. Quality control of this design will have to guarantee the lack of any conductive occlusion between wires (cutting, dust, etc.). Moreover, excessive hammering (hardening) of the conductor which could destroy the fiber glass tape, shall be avoided. The conductor shall be wrapped with glass tape with 50% overlap to produce approximate insulation thickness of 0.5 mm turn to turn. Then the insulated conductor shall be wound around the coil winding fixture. After completion of winding, ground insulation shall be provided by wrapping further layers of glass cloth.

- The winding of the pancake should be tight enough to meet the dimensions. Utmost care has to be taken to maintain the dimensions and insulation of the coil. The insulation in the vicinity of the pancakes leads shall be done carefully to avoid any damage.

- All the pancakes shall be marked before stacking to form a coil. The stacking of pancake shall be such that the pancake terminals shall be arranged as per fabrication drawing (**Drawing No. IUAC/CYCLO/08, sheet 1 of 1 (Annexure-L)**). The electrical connectors (between pancakes, between coils and with the power supplies) shall be brazed using silver brazing filler (at least 40% silver) in position (as per fabrication drawings(**Drawing No. IUAC/CYCLO/08, sheet 1 of 1 (Annexure-L)**) such that joints are not affected by demineralized water/environment. Pancakes of each coil shall be electrically connected in series in such a way that the direction of current flow in all pancakes in a coil shall be same. Electrical connections between pancakes shall be made by brazing of proper copper connectors that can carry at least 150 % of maximum current without significant heating.

- The electrical connectors and bus bar (or flexible cable) that will be used for connecting two coils shall be designed and made to conduct at least 200 % of maximum current without significant heating. The electrical connectors for connecting with power supply cables shall be designed and made to conduct at least 200 % of maximum current without significant heating and to withstand a maximum force of 50 kg exerted by the incoming cables on the terminals.

- The connectors for fixing thermal switches and water connections shall also be brazed on pancake leads using silver brazing filler (at least 40% silver). The sequence of brazing of all connectors shall be decided by the fabricator. The material of the electrical connectors shall be copper and water connectors shall be non-porous bronze/Brass. During brazing, proper care and precautions have to be taken to keep safe the insulations of the coil. Any damage in insulation due to bad handling or during brazing shall be subjected to rejection. The coils have to be cleaned properly after brazing.

- Before epoxy cast/after brazing water connectors with the pancake terminals, cooling passage of each pancake shall be tested passing with at least 5 mm diameter steel ball and documented.

- The coil then shall be placed in a mould in a vacuum oven. The mould for this coil shall be designed and fabricated by the fabricator to meet the required dimensions and geometric tolerances of the cast coil as shown in the drawing. The epoxy cast of coil shall be done by vacuum impregnation method. The mould then have to be heated, if required, to a required temperature and hold for complete resin polymerization. The process parameters during epoxy casting should be controlled as per epoxy manufacturer's recommendation to meet properties of cured epoxy. If epoxy manufacturer's recommendation in this regard is not available the fabricator shall prepare test coupons to fix the process parameters. The test results of the test coupons and process parameters must be documented.

- The insulation in the vicinity of the pancake leads and terminations will require special attention, in order to provide adequate strength and to avoid the presence of excessive resin in that area. Glass roving or pre-formed glass epoxy inserts must be inserted in these areas.

- Thermal cut-off switches (fully insulated in a screw on housing type), set to open an electrical circuit at 40°±5°C shall be fitted on the external lead (return lead of water

circuit) of each pancake. The fabricator will ensure that good thermal and mechanical contact is obtained using materials that meet the requirements of this specification.

- The conductor terminal ends of each pancake shall be connected with cooling water manifolds via non conducting flexible tubes. There will be two manifold/headers (supply and return) for each coil. The manifolds shall be made from SS304/SS316. The connectors at each pancake and manifold end shall be from reputed manufacturer with proper pressure and temperature rating. All pancake terminal water connections shall be connected with respective manifolds via proper non-conducting tube with proper pressure and temperature rating. The connectors and tubes shall have a working pressure rating at least 12 bar @ 100 ºC. The manifolds will be vertically mounted and the connection points will be at the bottom end.

- The water cooling circuit to be designed as per drawing. Design parameters for cooling of magnet coils :- Limiting value of temperature rise (deg T) of magnet coils < 40 ºC ; Velocity of flow in magnet coils < 3 m/sec ; Pressure-drop (delta P) in magnet coils < 4 bar.

- Suitable thermal switches will be placed on outer terminals of the coils to prevent over-heating of the coils (cut-off value: > 40 ºC) by shutting off the power supply.

- All the terminations of the coils shall be connected to electrical power connection points. Junction boxes shall be firmly attached to the electromagnet body.

4.3 Electromagnet assembly.

- The electromagnet coil shall be assembled with the electromagnet core. The coils shall be firmly attached to the electromagnet core to avoid the movement of coils.
- The magnets shall have all electrical connections (including power terminals) on one of the side yokes of the magnet.
- The air gap between the magnet poles shall be free of any materials and have full access.
- The interfaces between the busses and the coils shall be silver plated. Either split or Belleville (conical) washers shall be used under flat washers, bolt head or nut.
- The terminals shall be suitable to receive the incoming supply cable connectors and must be designed to withstand tension forces exerted by the incoming cables on the terminals. The connection between the coil terminals and the incoming junction box shall be the responsibility of the supplier.
- The coil terminals, the connection posts and all metallic parts connected to them shall be protected against accidental contact by an insulating, transparent cover, which can only be removed by the use of tools.
- A single terminal connection post able to receive a 10 mm^2 cable shall be provided for earthing of the yoke. The supplier shall ensure that there is adequate electrical connection between the yoke, manifolds and other components so that all exposed metallic parts of the magnet are safely earthed by this terminal post.
- Colour of the magnet shall be RAL 5010(Blue). However, Supplier can suggest the colour, aesthetics and other details as suitable***. The final decision will be taken by IUAC***.

Supplier must use best quality/IS certified material only.

4.4 Magnet mounting structure

The supplier is supposed to make the mounting structure for this magnet as shown in the drawing (**Drawing No. IUAC/CYCLO/03, sheet 1 of 1 (Annexure-L)**), however, if there are any changes required, the supplier can discuss with IUAC personnel before finalisation.

5. Requirements of Manufacturing and Workmanship

- The manufacturing process and workmanship shall be consistent with high grade industrial practice and shall be adequate to achieve the accuracies for intended requirements. Manufacturing process shall ensure the interchangeability of parts.
- If supplier wants to use any jigs and fixtures for the manufacture, same shall be approved by the purchaser. Before commencement of production, supplier shall prepare quality control sheets for various stage of manufacturing and same shall be approved by the purchaser and will be used by third party/ IUAC.

6. Acceptance tests

(a) Factory acceptance tests

- After the mechanical assembly of the H-Dipole, DC magnet, the main geometrical dimensions like length along the yoke, flatness of the whole assembly, squareness of the sides and of end faces, pole shoe profile shall be measured according to the tolerance mentioned in the approved manufacturing drawings and recorded.
- The excitation curve (measured magnetic field versus current) of the electromagnet should be measured from 0 to maximum current of 220 A (10% higher than the nominal value of 200 A) at a step of 10 A, keeping the Hall probe positioned in the median plane of the magnet, at the centre of the pole. This excitation curve should be recorded at each excitation level of the current and the measured magnetic field.
- Field mapping in the median plane of the magnet should be carried out. Homogeneity of the magnetic field at different radial and angular positions w.r.t. the central field ($\delta B/B$) shall be measured and compared with the results obtained using simulations. Deviation in the parallelism of the pole faces, deviation in the horizontal positions of (top and bottom) pole centres beyond the limit of the tolerances would be directly reflected by the loss of symmetry in the measured data of the magnetic field on the either sides of. the pole centre. Homogeneity of $\delta B/B \sim 18 \times 10^{-3}$ over a radius of 120 mm of the pole is required as per design.
- The distance between the poles and individual poles horizontality shall be measured and recorded.
- When fully assembled, the gap between the poles shall be measured for parallelism. The gap shall vary less than over the +/- 0.05 mm on entire pole faces.
- After winding of each pancake, the pancake should be carefully taken out from the fixture, provide a tight layer of glass fiber tape around the complete coil pancake

intermittently for ground insulation, inspect for mechanical geometry and electrical parameters (resistance & inductance values) for their acceptance prior to epoxy resin impregnation of the coils under vacuum.

- Insulation resistance testing: The insulation resistance between the coil terminals and mandrel using minimum voltage of 1kV DC shall be measured and noted.
- Insulation leakage current testing (HiPot Testing): DC voltage of 1 kV shall be applied between coil terminals and mandrel for one minute and the leakage current shall be recorded. The main coils shall be hi-pot tested at 1 kV DC for 1 minute, and it should have less than 1μA leakage to the yoke.
- After the assembly of complete magnet with coils, cooling hoses and mounting brackets fitted, the complete assembly shall be measured to ensure that it complies with the dimensional tolerances specified in the approved manufacturing drawings.
- The magnet coil shall be excited using with rated current for 24 hours, for long term stability. The local hot spots, evidence of overheating and other faults during the testing shall be recorded.
- Coil resistance and inductance measurements shall be made with a micro-ohmmeter resistance bridge at room temperature, with the coil temperature uniform throughout and steady state conditions prevailing.
- The equipment should be supplied and be ready to install and operate. A team of experts constituted by IUAC will further test the equipment for its stated performance in the presence of the vendor. **All testing equipment shall be arranged by the vendor at no extra cost.**

(b) Acceptance tests, after delivery at IUAC, New Delhi

After shipment to IUAC, the magnet will be tested by IUAC personnel with full power to check the magnetic field is maintained as per design, before releasing the payment.

7. Quality Assurance

- 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 Allow access at all reasonable times during manufacture, assembly and testing to the premises in which the work is being carried out.
- 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.
- Produce an inspection plan (QAP) 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.
- Dispatch of the H-magnet and accessories may be done after acceptance by IUAC personnel.
- The supplier shall be responsible for the inspection of the components that is

subcontracted by him.

- 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.

8. General conditions

(a) **Stages of approval from IUAC, New Delhi**

- The supplier shall workout a detailed design drawing to meet fabrication requirements**. All the drawings and documents will be verified and accepted by IUAC personal before actual fabrication.**
- The Supplier shall provide in detail the material standards, processes and the quality control procedures followed by them and taken aproval form IUAC before actual fabrication.
- Preparation of **Fabrication Design Report (FDR)** which shall consist of different parameters of coils, basic cooling calculation of coils at maximum current, specification of all raw materials to be used, fabrication drawings of coils including individual pancakes, lead ends, water connections of pancakes, bus bar (or flexible cable) for connecting two coils, lug ends to connect coils and with power supply, connectors for fixing thermal switches, water header etc., Quality Assurance Plan (QAP) and a detailed time schedule.

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

(b) Documentation Requirements from the Supplier

- Documentation to be furnished after the receipt of purchase order and before fabrication/integration jobs.
- A time bar chart should be mutually finalized for proposed schedule of execution of the H-shaped electromagnet .
- Approved manufacturing drawings of the coils, magnetic structure and its support stand.
- Detailed documentation showing the material test certificates of the yoke, pole and coil.
- Technical details about the glass cloth, epoxy resin chemical system used for the coil production
- Technical details of the proposed over-temperature, sensors and the method of mounting the temperature sensor on the coil.
- List of the tests (electrical, mechanical and thermal) to be carried for the coils, magnet yoke and assembled magnet.

Documentation to be furnished along with the supply of system.

- Test report on the electrical, mechanical and thermal tests which has been carried out on the coils, magnet yoke and assembled magnet.
- Excitation curve of magnetic field and homogeneity measurements reports.

(c) Requirements of Supplier Qualifications

- The bidder shall provide with the tender document sufficient information for technical evaluation of the supplier.
- The supplier shall provide the following details

  Human resources: The supplier must give the details of human resources including Engineers, Draftsman, Electrical, Welder, assembly mechanic, quality control inspector, machinist etc.

  Infrastructure: The supplier must give the details of infrastructure suitable for this job.

  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.

Special Conditions:

- The vendor must mention original manufacturer's name of the conductor before placing order for the conductor.
- The conductor manufacturer (Production unit) should operate under a quality management system ISO 9001(2015 or latest) and ISO 14001 for environment management system for manufacturing extruded, drawn copper products and testing of their own products in their scope. Their certificates must be available in their website.

9. Packing and Delivery

- Protective covers: Supplier shall make necessary arrangements for all components using a suitable PVC cover or moulded thermacol. Proper care should be taken while handling the component during fabrication, inspection, testing and packing.
- 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. Spare components One set of spare pole shoes (02 Nos) are required as per drawing (**Drawing No. IUAC/CYCLO/11, sheet 1 of 1 (Annexure-L)**)

Seal & Signature of Bidder

Annexure – B

TENDER ACCEPTANCE LETTER

(To be given on Company Letter Head)

Date:

To,
The Director
IUAC, New Delhi-67

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: IUAC/NIT/
Name of Tender / Work: -

Dear Sir,

I/ We have downloaded / read and examined the tender document(s) for the above-mentioned Tender /Work from the web site(s) namely:

_____

as per your advertisement, given in the above-mentioned website(s).

1. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents (including all documents like annexure(s), schedule(s), etc.,), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.
2. The corrigendum(s) issued from time to time by your department/ organization too have also been taken into consideration, while submitting this acceptance letter.
3. I / We hereby unconditionally accept the tender conditions of above-mentioned tender document(s) / corrigendum(s) in its totality / entirety.
4. I / We do hereby declare that our Firm has not been blacklisted/ debarred by any Govt. Department/Public sector undertaking.
5. I / We certify that all information furnished by our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organization shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

Annexure - C

PROFILE OF THE TENDERER

(To be given on Company Letter Head)

TENDER FOR SUPPLY OF "Fabrication, machining, coil winding, epoxy impregnation, integration, testing and supply of one H-Dipole water-cooled, DC electromagnet with mounting structure as per Annexure A" at IUAC, New Delhi.

1. Name of the Firm / Organization :

2. Address :

3. Telephone No. / Mobile No. & Name of the Contact Person :

4. Fax No. :

5. E-mail ID :

6. Month and Year of establishment :

7. Name of proprietor / partners/director :

8. No. of years of experience in this field, with Reference, Certificates :

9. Annual Turnover during the last three years (Enclose copies of Audited Financial Statement duly certified by CA

   2021-22 :
   2022-23 :
   2023-24 :

10. Whether the firm is a Tax Assessee? If so, please give the details of PAN No. and copies of ITR files for the last three financial years :

11. GST Registration No. :

12. Name of the OEM and address :

Signature of the Tenderer & Seal

Annexure-D

Format for declaration by the Bidder for Code of Integrity & conflict of interest (On the Letter Head of the Bidder)

No: _____ Date _____

To,

The Director IUAC

New Delhi

Sir,

With reference to your Tender No._____ dated_____I/We hereby declare that we shall abide by the Code of Integrity for Public Procurement as in your Tender document and have no conflict of interest.

It is certified that we are not associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Purchaser to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods to be purchased under this Invitation of Bids / Tender.

The details of any previous transgressions of the code of integrity with any entity in any country during the last three years or of being debarred by any other Procuring Entity are as under:

a
b
c

We undertake that we shall be liable for any punitive action in case of transgression/ contravention of this code.

Thanking you,

Yours sincerely,

Signature
(Name of the Authorized Signatory)

Company Seal

Annexure E

This certificate shall be furnished duly signed & stamped with **Technical Bid.**

Certificate/ Undertaking for site visit (if applicable)

On Company Letterhead

This is to certify that we have visited the site where ---------- works have to be done in IUAC lab complex on …..... and assessed the actual situation & nature of site. We have also assessed the amount of work involved at site for tendered work before submitting our offer. We will be able to complete the above work within stipulated time as per site conditions.

We further undertake that no extra cost will be claimed by us later-on for any difficulties/ modifications involved during the execution of tendered works. We understand that work is to be executed in an already operational/ functional institute.

(Signature of the Bidder, with Official Seal)

Annexure-F

(Undertaking to be given on Bidders/ Company Letter Head)

I / We (bidder) hereby give an undertaking that:

1. I / We have not been blacklisted / on holiday list / debarred during last three years by any Govt. Department/Govt. Autonomous Body/Institution, etc.

2. I/We do not have any dispute with any of the Govt. Departments/ Govt. Autonomous Bodies/Institutions, etc.

3. I/We have never been certified as 'Unsatisfactory Performer" for the said services provided to the Govt. Departments/ Govt. Autonomous Bodies/ Institutions;

4. I/We have not submitted any fake/forged certificates/ documents and later, if any such 'Certificates/Documents' found to be fake/ forged or contains willful wrong/incorrect information, suitable legal actions may be initiated against me/us/agency and the agencies/ bidders shall be debarred from tendering withe the Institute.

5. I/We shall not withdraw my/our bid after opening of Technical Bid and if done so, the IUAC and the agencies / bidders shall be debarred from tendering with the Institute.

Seal and Signatures of the Authorized
Person of the Agency

Name and designation of the
Authorized Person of the Agency

Place:
Date:

Annexure-G

DECLARATION OF LOCAL CONTENT

(To be given on Company Letter Head – For tender value below Rs.10 Crores)

(To be given by Statutory Auditor/ Cost Auditor/ Cost Accountant/ CA for tender value above Rs.10 Crores)

To,
The Director,
Inter University Accelerator Centre
Aruna Asaf Ali Marg
New Delhi- 110 067

Subject: - Declaration of Local Content

Tender Reference No:_____

Name of Tender/ Work: _____

1. Country of Origin of Goods being offered: _____

2. We hereby declare that items offered has local content * (details) _____
& %age _____

3. Details of the Location at which the Local Value Addition is made _____
_____
_____

We hereby certify that we fall under the category of the supplier (tick appropriate category):

1. Class –I Local Supplier
2. Class –II Local Supplier
3. Non-Local Supplier

We also declare that:

a) There is no country whose bidders have been notified as ineligible on a reciprocal basis under this order for an offered Goods, or
b) We do not belong to any Country whose bidders are notified as ineligible on a reciprocal basis under this order for the offered Goods.

* "Local Content" means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

Bidders offering Imported products will fall under the category of Non-Local Suppliers. They cannot claim themselves as Class-I or Class –II Local Suppliers by claiming the services such as Transportation, Insurance, Installation, Commissioning, Training and After Sale Service Support like AMC/ CMC etc. as Local Value Addition.

"*False declaration will be in breach of Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law."

Yours faithfully,

(Signature of the bidder, with Official Seal)

Note: Preference shall be given to local suppliers as per revised Public Procurement (Preference to Make in India), Order 2017, No. P-45021/2/2017-PP (B.E-II) dated 16.09.2020 issued by DPIIT, Ministry of Commerce and Industry, Govt. of India. (Submit duly filled Declaration of Local Content for the same). The Declaration once submitted in the Technical Bid will be final. Submission of Revised Declaration will NOT be accepted.

Annexure-H

CHECK-LIST FOR PRE-QUALIFICATION BID FOR: "Fabrication, machining, coil winding, epoxy impregnation, integration, testing and supply of one H-Dipole water-cooled DC electromagnet with mounting structure as per Annexure A". at IUAC, Aruna Asaf Ali Marg, New Delhi-110067

Sl. No.	Documents Provided	Page number
1.	Technical Specification as per the details as given in **Annexure A**	
2.	Tender Acceptance Letter as given in **Annexure-B**	
3.	Profile of the tenderer as given in **Annexure-C**	
4.	Declaration for Code of Integrity and Conflict of Interest as given in **Annexure-D**	
5.	Site visit undertaking as given in **Annexure-E** (if applicable)	
6.	Undertaking on a letter head (as per format prescribed in **Annexure-F**) along with tender document.	
7.	Declaration of local content as given in **Annexure-G**	
8.	Compliance Sheet for quoted items-**Annexure-I**	
9.	Proof of submission of EMD/ MSME/NSIC Registration Certificate as per **Annexure -J**	
10	Checkpoints List- **Annexure K**	
11	-Magnet drawings- **Annexure-M**	
12.	Self-attested copy of the GSTIN & PAN card issued by the respective authorities.	
13.	Copies of work/supply orders as specified in the NIT along with satisfactory performance certificates from the concerned employers.	
14.	Annual turnover of last three financial years (2021-2022, 2022-2023 and 2023-2024) duly certified by the Statutory Auditors. To support the claim, provide a certificate of CA (No need to provide copies of balance sheet).	
15.	Copies of ITR filed for the last three financial years	
16.	Certificate – Bidder Not from/ from Country sharing Land border with India, Registration of Bidder with Competent Authority & not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.	
17.	OEM Authorization Certificate and Manufacturer's Authorization form	
18.	Proof of delivery of high-end scientific equipment in last 5 years	
19	Any other documents asked in this tender	

(Seal & Signatures of Contractor)

(Name and Address of the Bidder)

Annexure - I (COMPLIANCE SHEET to be filled along with Technical Bid)

Sr No	Parameter	Requirement	Remarks/ Complied/ Not Complied
1.	Name and address of the firm (Profile of the Company)		
2.	Address of all factory premises where work is intended to be done		
3.	Year of Incorporation of Company/Establishment		
4.	Quality accreditation (ISO)		
5.	Name and designation of officers representing the firm		
6..	Turn-over during last 5 years		
7.	Experience criteria:	Attach copy of PO from Government Organisation/Particle Accelerator laboratory	
8.	DC electromagnets manufactured/fabricated/marketed by the firm in last 5 Years		
9	Magnetic steel specifications/Catalogues for AISI 1010 or better Steel.	1. Carbon content < 0.1 %	
10	Copper conductors for coils: OFHC square hollow conductor	Mention Grade: OF-OK oxygen free copper grade ASTM C10200 Manufacturer: Size of Conductor:	

11	Water manifold for coils	Shall be made of SS 316 / SS 304 or better. Fittings shall be of reputed make (Legris/Parker etc)	
12	Details of in-house testing magnet testing facility Note: Final Testing of assembled magnet will be performed at supplier premises, hence supplier is required to provide a list of testing facility available in-house.	Equipment required for field mapping: a)3D magnet field mapping system with Hall probe, associated control software for the field mapping	
13	Whether Bidder have in-house High Current programmable DC Power source for energizing magnet.	a)DC Power supply rating: Voltage: 20V Current : 200 Amps b)Stability of power supply, at least 100 ppm	
14	Whether Bidder have inhouse facility for Geometrical measurements.	a)CMM and allied measuring instruments	
15	Whether Bidder have In-house electrical testing facilities.	➢ Insulation Resistance ➢ Hipot Test ➢ Inductance	
16	Whether Bidder have Inhouse Hydraulic Testing Facility for Coils	1.Hydrostatic Test @30 Bars 2. Hydrodynamic Test @8 Bars: Steel ball diameter 5 mm	

Compliance Sheet for quoted items along with acceptance of P.O

S.No	Specification	COMPLIED (YES/NO)
1.	Approval of the fabrication drawings and working document by IUAC within 15 days of P.O acceptance	
2.	Approval of raw material (Supplier shall submit the material test certificates) within 15 days of P.O acceptance a)Steel for magnet core b)Copper for Coil	
3.	On sub-components (a)Mechanical inspection of yokes on CMM. (b)Mechanical scanning of pole shape on scanning type CMM. (c)Mechanical inspection on other subcomponents like yoke connectors and magnet base platforms (d) A thin layer of anti-rust lacquer to be applied on all the joints and on non-painted surface of poles, and electroless nickel on pole cap	
4.	On assembled magnets (a) Measurement of both pole tips to pole tip distance on assembled magnets. (b) Measurement of radial offset between the upper and lower half magnets	
5.	Electrical junction box to be mounted on yoke	
6.	Manifold with flexible pipe for water distribution to the coils	

Name of Bidder/ Signature/ Stamp

Annexure-J

BID SECURING DECLARATION FORM

(TO BE SUBMITED BY MSME ONLY ON COMPANY LETTER HEAD)

Tender/Bid No.: Date:

To
The Director
Inter University Accelerator Centre (IUAC)
New Delhi
Dear Sir/Madam,

We, the undersigned, solemnly declare that:

We understand that, according to the conditions of this Tender Document, the bid must be supported by a Bid Securing Declaration In lieu of Bid Security.

We unconditionally accept the condition of this Bid Securing Declaration. We understand that we shall stand automatically suspended from being eligible for bidding in any tender in IUAC for a period of two years from the date of opening of this bid if we breach our obligation under the tender conditions, if, we,

1) withdraw/amend/impair/derogate, in any respect, from our bid, within the bid validity; or
2) being notified within the bid validity of the acceptance of our bid by IUAC

(i) fail or refuse to sign the contract, or
(ii) failed or refused to produce the original documents for scrutiny or the required Performance Security within the stipulated time under the conditions of the tender documents.

We know that this Bid Securing Declaration shall expire if the contract is not awarded to us, upon:

1) receipt by us of your notification
   a) of cancellation of the entire tender process or rejection of all bids or
   b) of the name of successful bidder or

2) Forty-five days after the expiration of the bid validity or nay extension to it.

Signed:

Name:

Dated on _____ day of _____

Corporate Seal (where appropriate)

(Note: In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid)

Annexure K

Acceptance criteria

1. The features of the poles shall be fabricated as per the drawing .
2. The upper pole and lower pole of the magnet shall be concentric within ± 0.1 mm.
3. The parallelism between the top and bottom poles shall be within ± 50 microns.
4. The excitation curve (measured magnetic field versus current) of the electromagnet should be measured from 0 to maximum current of 220 A (10% higher than the nominal value of 200 A) at a step of 10 A, keeping the Hall probe positioned in the median plane of the magnet, at the centre of the pole. This excitation curve should be recorded at each excitation level of the current and the measured magnetic field.
5. Field mapping in the median plane of the magnet should be carried out. Homogeneity of the magnetic field at different radial and angular positions w.r.t. the central field ($\delta B/B$) shall be measured and compared with the results obtained using simulations. Deviation in the parallelism of the pole faces, deviation in the horizontal positions of (top and bottom) pole centres beyond the limit of the tolerances would be directly reflected by the loss of symmetry in the measured data of the magnetic field on the either sides of. the pole centre. Homogeneity of $\delta B/B \sim 18 \times 10^{-3}$ over a radius of 120 mm of the pole is required as per design.
6. The magnet coil shall be excited using with rated current for 24 hours to achieve the maximum field of 1.2 Tesla for long term stability. The designed field has been modelled with CST Microwave Studio for 3D and POISSON code for 2 D related designs. The final measured value should match the designed value of 1.2 T. Relevant documents of design can be supplied, if the vendor requires during technical bid discussion.
7. The long term temperature stability of the coils (48 hours) should be monitored together with the magnetic field to ensure no variation in the magnetic field is observed. Safety interlocks for testing the temperature sensors should be confirmed.

Part-B

PRICE BID

(Price should be quoted in the standard BOQ format of this tender, incomplete price bid will be rejected)

Tender Inviting authority: **INTER UNIVERSITY ACCELERATOR CENTRE**

Name of Work/Supply: **Fabrication, machining, coil winding, epoxy impregnation, integration, testing and supply of one H-Dipole water-cooled, DC electromagnet as per Annexure A**

S.No.	Description	Qty (No)	Price Offered (INR)
1	**"Fabrication, machining, coil winding, epoxy impregnation, integration, testing and supply of one H-Dipole water-cooled, DC electromagnet with mounting structure as per Annexure A" and delivery at IUAC, New Delhi -110067.**	01	
2	**Spare pole shoe set (as per drawing)**	01	

Annexure – L

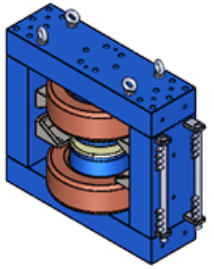
Magnet Drawings

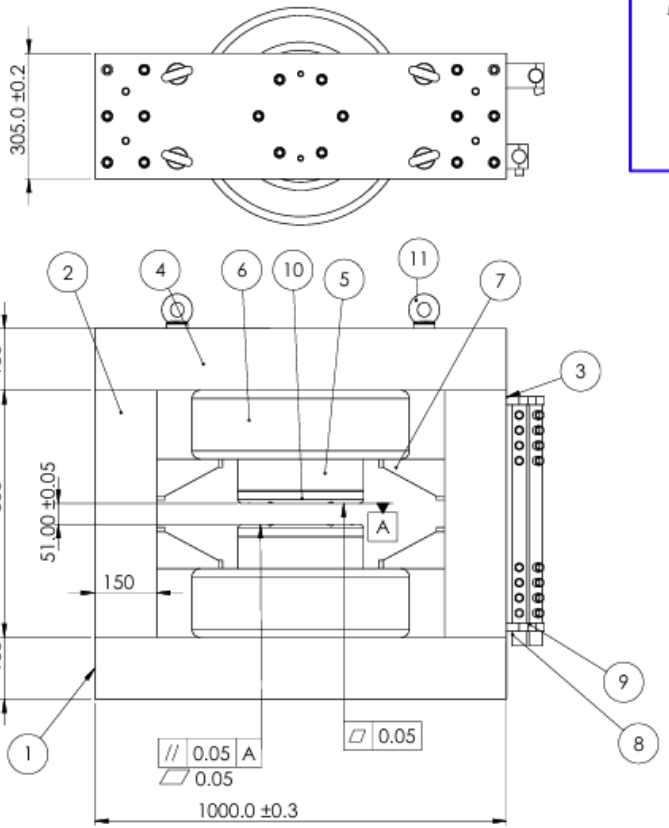
Sl.No	Drawing No.	Description
1	IUAC/CYCLO/01	H-Magnet
2	IUAC/CYCLO/02	Magnet +stand
3	IUAC/CYCLO/03	Stand
4	IUAC/CYCLO/04	Top yoke
5	IUAC/CYCLO/05	Bottom yoke
6	IUAC/CYCLO/06	Side yoke-1
7	IUAC/CYCLO/07	Side yoke-2
8	IUAC/CYCLO/08	Coil
9	IUAC/CYCLO/09	Pole
10	IUAC/CYCLO/10	Pole tip-1
11	IUAC/CYCLO/11	Pole tip- spare

Note: If any clarification is required in the drawings kindly contact IUAC for the details.

Magnet data

- Magnetic field-1.2 Tesla (at median plane)
- Pole gap- 51 ± 0.05mm
- Pole diameter -305mm
- Pole tip-Removable





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	BOTTOM YOKE		1
2	SIDE YOKE-1		1
3	SIDE YOKE-2		1
4	TOP YOKE		1
5	POLE		2
6	COIL MODEL		2
7	COIL SUPPORT-01		4
8	Inlet Manifold		1
9	Outlet manifold		1
10	POLE TIP-1		2
11	M24-EYE BOLT		4
12	B18.3.1M - 16 x 2.0 x 130 Hex SHCS -- 44NHX		15
13	AM -- M12 x 80 N		4
14	AM -- M16 x 60 N		8
15	B18.3.1M - 16 x 2.0 x 140 Hex SHCS -- 44NHX		24

Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish 3.2 unless specified.
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)

	NAME	SIGNATURE	DATE
DRAWN	Thomas V		11/03/2023
APPVD	G.RODRIGUES		
MFG			
Q.A			

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR: FINISH: DEBURR AND BREAK SHARP EDGES

अंतर विश्वविद्यालय त्वरक केंद्र
Inter-University Accelerator Centre - (IUAC)

TITLE: H-MAGNET

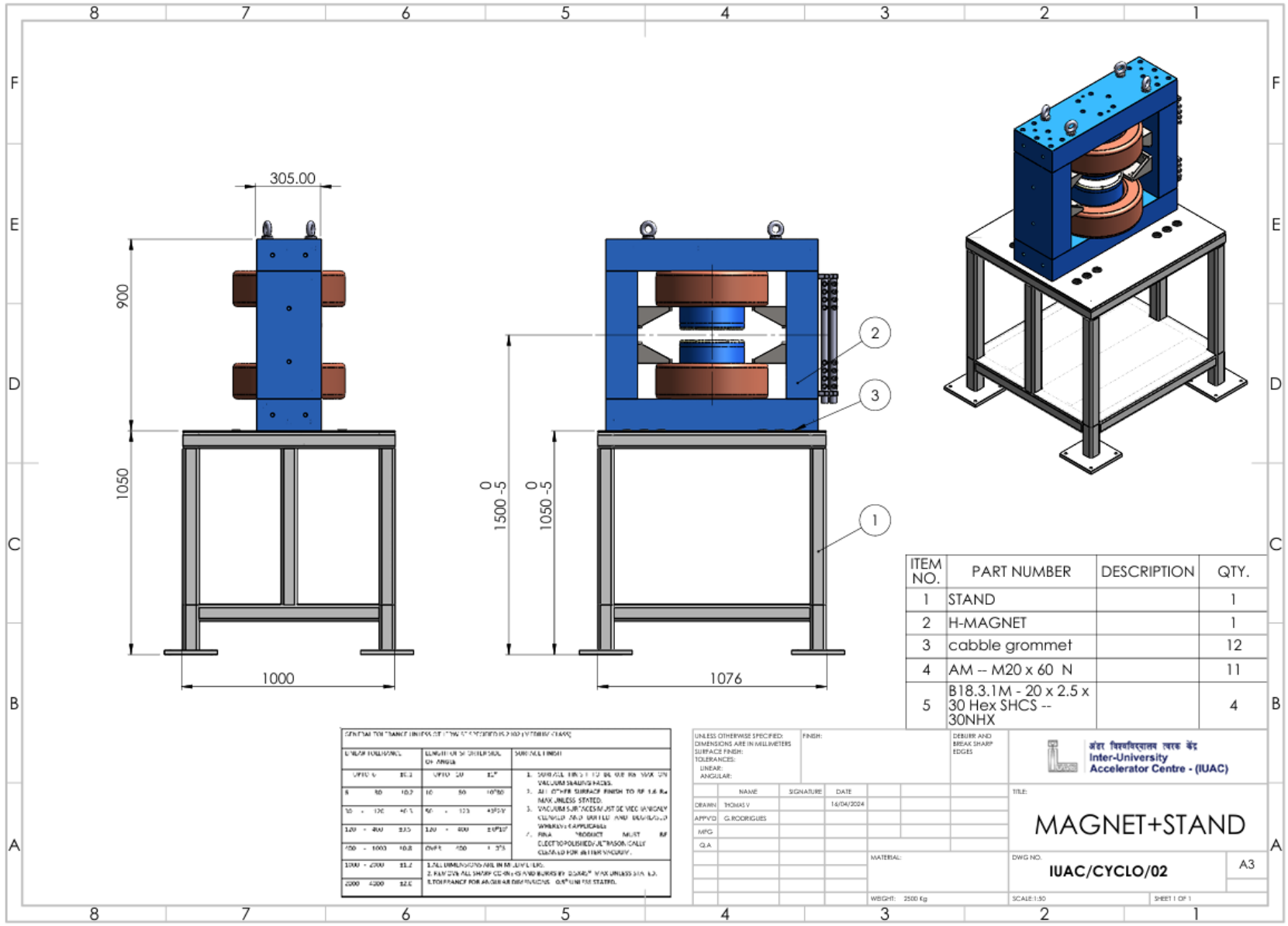
MATERIAL: 1.MAGNET STEEL -AISI 1010 2.COIL/CONDUCTOR -OFHC COPPER C-10200

WEIGHT: 2000 Kg

DWG NO. IUAC/CYCLO/01

A3

SCALE:1:10 SHEET 1 OF 1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	STAND		1
2	H-MAGNET		1
3	cabble grommet		12
4	AM -- M20 x 60 N		11
5	B18.3.1M - 20 x 2.5 x 30 Hex SHCS -- 30NHX		4

	NAME	SIGNATURE	DATE
DRAWN	THOMAS V		16/04/2024
APPVD	G.RODRIGUES		
MFG			
Q.A			

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:
FINISH:
DEBURR AND BREAK SHARP EDGES

MATERIAL:
WEIGHT: 2500 Kg

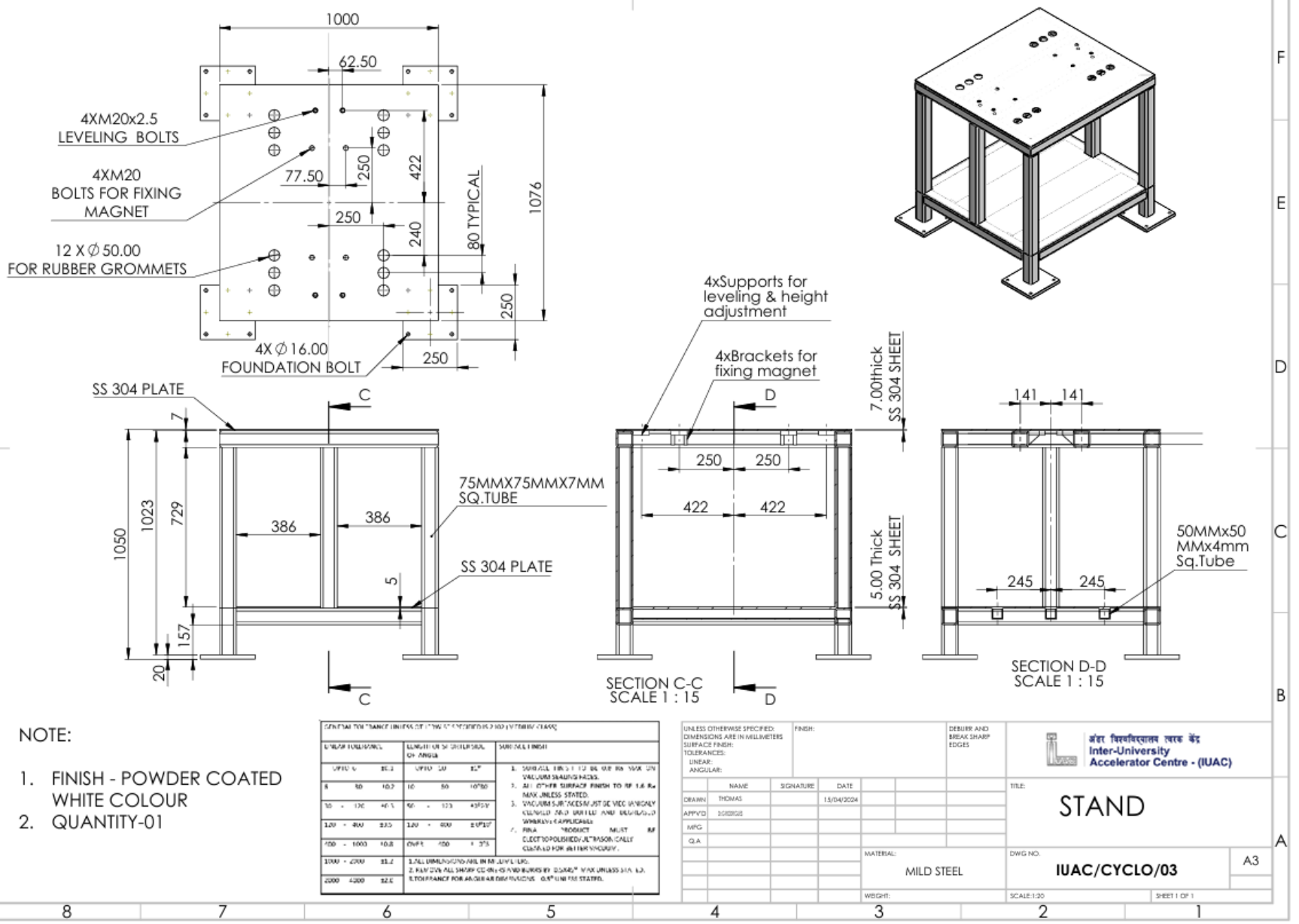
अंतर विश्वविद्यालय त्वरक केंद्र
Inter-University Accelerator Centre - (IUAC)

TITLE:
MAGNET+STAND

DWG NO.
IUAC/CYCLO/02

A3

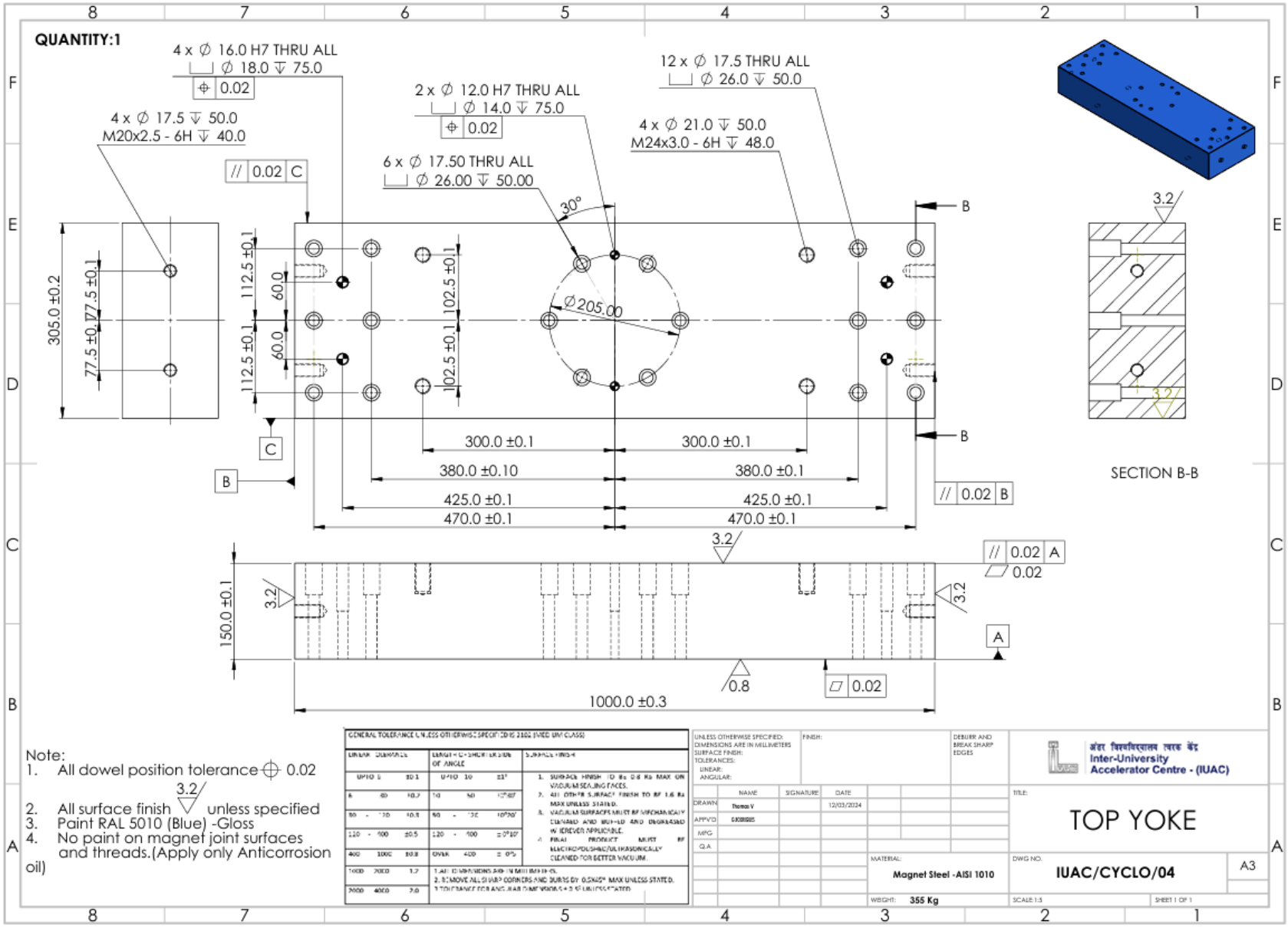
SCALE:1:50
SHEET 1 OF 1



NOTE:

1. FINISH - POWDER COATED WHITE COLOUR
2. QUANTITY-01

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	FINISH:	DEBURR AND BREAK SHARP EDGES	अंतर विश्वविद्यालय त्वरक केंद्र Inter-University Accelerator Centre - (IUAC)
	NAME	SIGNATURE	DATE
DRAWN	THOMAS		15/04/2024
APPVD			
MFG			
Q.A			
MATERIAL: MILD STEEL			TITLE: STAND
WEIGHT:			DWG NO. IUAC/CYCLO/03
SCALE:1:20			A3
SHEET 1 OF 1			



Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish $\overset{3.2}{\nabla}$ unless specified
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	FINISH:	DEBURR AND BREAK SHARP EDGES

अंतर विश्वविद्यालय त्वरक केंद्र
Inter-University Accelerator Centre - (IUAC)

	NAME	SIGNATURE	DATE
DRAWN	Thomas V		12/03/2024
APPVD	GIORGIOS		
MFG			
Q.A			

TITLE: **TOP YOKE**

MATERIAL: **Magnet Steel -AISI 1010**

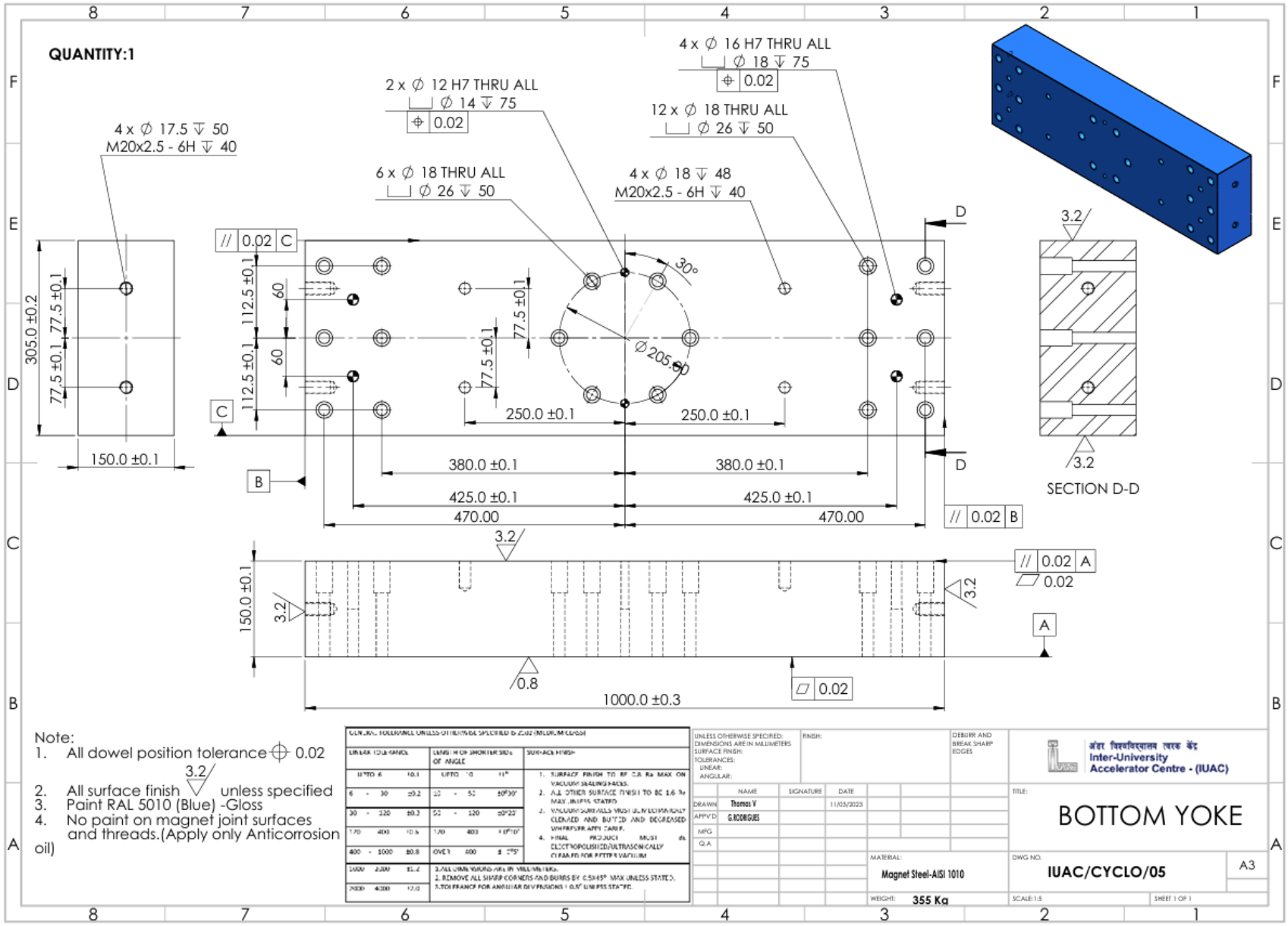
DWG NO. **IUAC/CYCLO/04**

A3

WEIGHT: **355 Kg**

SCALE:1:5

SHEET 1 OF 1

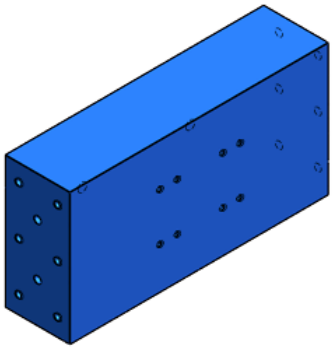


Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish 3.2 ▽ unless specified
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)

GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED IS ISO 2768 MEDIUM CLASS				
LINEAR TOLERANCE		LENGTH OF SHORTER SIDE OF ANGLE		SURFACE FINISH
UPTO 6	±0.1	UPTO 10	1°	1. SURFACE FINISH TO BE 0.8 Ra MAX ON VACUUM SEALING FACES.
6 - 30	±0.2	10 - 50	±0°30'	2. ALL OTHER SURFACE FINISH TO BE 1.6 Ra MAX UNLESS STATED.
30 - 120	±0.3	50 - 120	±0°20'	3. VACUUM SURFACES MUST BE ULTRASONICALLY CLEANED AND BUFFED AND DEGREASED WHEREVER APPLICABLE.
120 - 400	±0.5	120 - 400	±0°10'	4. FINAL PRODUCT MUST BE ELECTROPOLISHED/ULTRASONICALLY CLEANED FOR BETTER VACUUM
400 - 1000	±0.8	OVER 400	± 0°5'	
1000 - 2000	±1.2	3.ALL DIMENSIONS ARE IN MILLIMETERS. 2. REMOVE ALL SHARP CORNERS AND BURRS BY 0.5X45° MAX UNLESS STATED. 3.TOLERANCE FOR ANGULAR DEVIATIONS ± 0.5° UNLESS STATED.		
2000 - 4000	±2.0			

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	FINISH:		DEBURR AND BREAK SHARP EDGES	अंतर विश्वविद्यालय त्वरक केंद्र Inter-University Accelerator Centre - (IUAC)
	NAME	SIGNATURE	DATE	TITLE: BOTTOM YOKE
DRAWN	Thomas V		11/03/2023	
APPV'D	G.RODRIGUES			
MFG				
Q.A				
MATERIAL: Magnet Steel-AISI 1010				DWG NO. IUAC/CYCLO/05 A3
WEIGHT: 355 Kg				SCALE:1:5 SHEET 1 OF 1

QUANTITY:1



Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish 3.2 ▽ unless specified
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)

GENERAL TOLERANCES UNLESS OTHERWISE SPECIFIED IS 2102 (MEDIUM CLASS)

LINEAR TOLERANCE		ANGULAR TOLERANCE FOR SHORTER SIDE OF ANGLE	
UPTO 6	±0.1	UPTO 10	±1°
6 - 30	±0.2	10 - 50	±0°30'
30 - 120	±0.3	50 - 120	±0°20'
120 - 400	±0.5	120 - 400	±0°10'
400 - 1000	±0.8	OVER 400	±0°5'
1000 - 2000	±1.2		
2000 - 4000	±2.0		

SURFACE FINISH NOTES
1. SURFACE FINISH TO BE 0.8 Ra MAX ON VACUUM SEALING FACES.
2. ALL OTHER SURFACE FINISH TO BE 1.6 Ra MAX UNLESS STATED.
3. VACUUM SURFACES MUST BE MECHANICALLY CLEANED AND RUBBED AND DEGREASED WHEREVER APPLICABLE.
4. FINAL PRODUCT MUST BE ELECTROPOLISHED/ULTRASONICALLY CLEANED FOR HIGH VACUUM.

1.ALL DIMENSIONS ARE IN MILLIMETERS.
2. REMOVE ALL SHARP CORNERS AND BURRS BY 0.5X45° MAX UNLESS STATED.
3.TOLERANCE FOR ANGULAR DIMENSIONS ± 0.5° UNLESS STATED.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

FINISH:

DEBURR AND BREAK SHARP EDGES

	NAME	SIGNATURE	DATE
DRAWN	Thomas V		12/03/2024
APPVD	G.RODRIGUES		
MFG			
Q.A			

MATERIAL: **Magnet Steel -AISI-1010**

WEIGHT: **192 Kg**

अंतर विश्वविद्यालय त्वरक केंद्र
Inter-University Accelerator Centre - (IUAC)

TITLE:

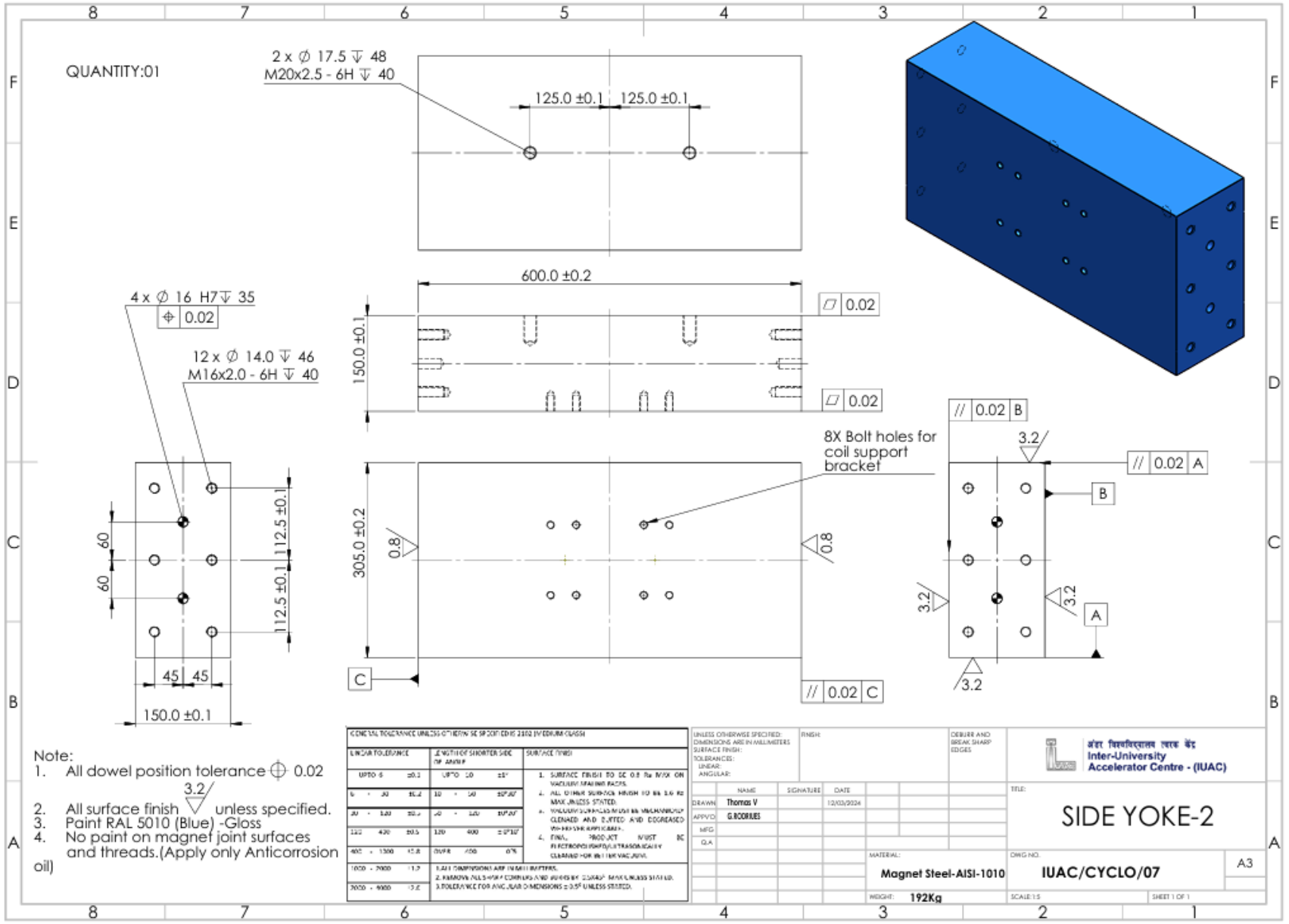
SIDE YOKE-1

DWG NO. **IUAC/CYCLO/06**

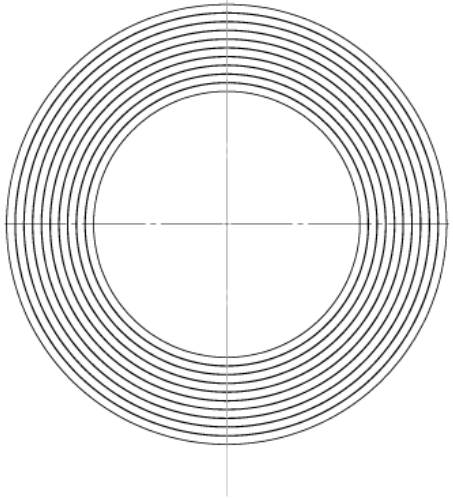
A3

SCALE:1:4

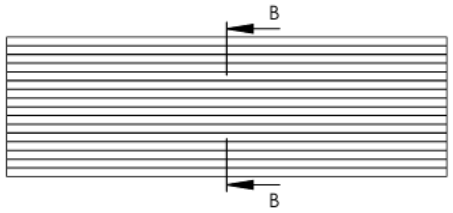
SHEET 1 OF 1

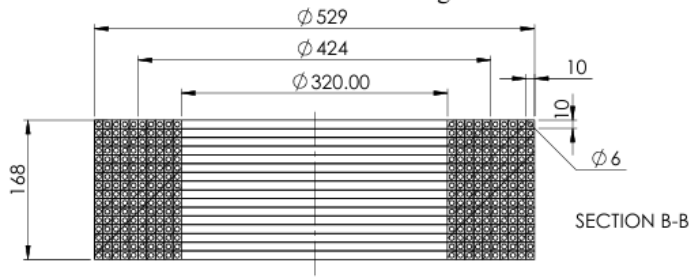

QUANTITY:01
2 x ∅ 17.5 ↧ 48
M20x2.5 - 6H ↧ 40
125.0 ±0.1
125.0 ±0.1
600.0 ±0.2
4 x ∅ 16 H7↧ 35
0.02
12 x ∅ 14.0 ↧ 46
M16x2.0 - 6H ↧ 40
150.0 ±0.1
0.02
0.02
8X Bolt holes for coil support bracket
305.0 ±0.2
0.8
0.8
// 0.02 B
// 0.02 A
// 0.02 C
3.2
60
60
112.5 ±0.1
112.5 ±0.1
45
45
150.0 ±0.1
C
A
B
Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish 3.2 unless specified.
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:
FINISH:
DEBURR AND BREAK SHARP EDGES
NAME
SIGNATURE
DATE
DRAWN
Thomas V
12/03/2024
APPVD
G.RODRIUES
MFG
Q.A
MATERIAL:
Magnet Steel-AISI-1010
WEIGHT:
192Kg
अंतर विश्वविद्यालय त्वरक केंद्र
Inter-University
Accelerator Centre - (IUAC)
TITLE:
SIDE YOKE-2
DWG NO.
IUAC/CYCLO/07
A3
SCALE:1:5
SHEET 1 OF 1

- **COIL ASSEMBLY**



- No.of coils-02
- Conductor type: Water cooled hollow conductor
- Material- OFHC Copper
- Conductor size-10MMX10MMX6MM Hole
- No.of rows - 16
- No.of columns-10
- No of double pan cakes-8
- Cooling water inlet temperature- 20˚c(Nominal)
- Temp.rise per double pan cake < 5˚C
- Inlet pressure-6 BAR
- Max. pressure drop per double pan cake <4 BAR
- Mean length of coil-0.424 Meter
- Current -200A
- Resistance of one coil-0.05 Ohm
- power dessipated in one coil-2000W
- Once each ―pancake is wound, it is cast in epoxy to hold it together.
- After all the coil layers are completed, the whole assembly is potted in epoxy to hold the coil together as a unit.

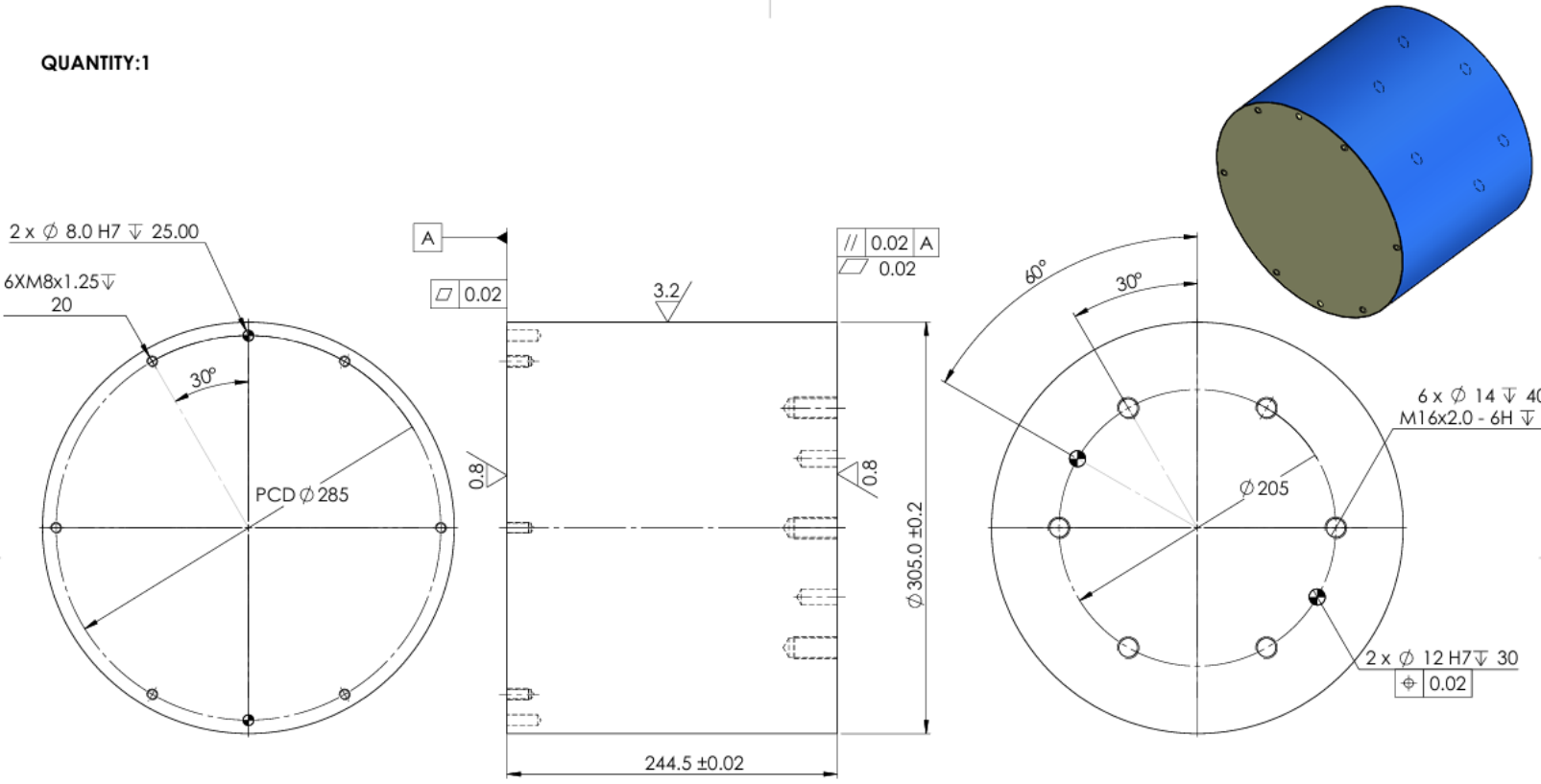




UNLESS TOLERANCE	LENGTH OF SURFACE OR ANGLE	SURFACE FINISH
UPTO 6 ±0.1	UPTO 50 ±1°	1. SURFACE FINISH TO BE 0.8 Ra MAX ON VACUUM SEALING FACES.
6 - 30 ±0.2	50 - 120 ±30'	2. ALL OTHER SURFACE FINISH TO BE 1.6 Ra MAX UNLESS STATED.
30 - 120 ±0.3	120 - 400 ±15'	3. VACUUM SURFACES MUST BE VISCOUSLY CLEANED AND DEGREASED WHEREVER APPLICABLE.
120 - 400 ±0.5	400 - 800 ±10'	4. FINAL PRODUCT MUST BE ELECTROPOLISHED/ULTRASONICALLY CLEANED FOR ULTRA VACUUM.
400 - 1000 ±0.8	OVER 800 ±5'	
1000 - 2000 ±1.2	1.ALL DIMENSIONS ARE IN MILLIMETERS.	
2000 - 4000 ±2.0	2. REMOVE ALL SHARP CORNERS AND BURRS BY 0.5MM* X 45° UNLESS STATED.	
	3.TOLERANCE FOR ANGULAR DIMENSIONS ±0.5° UNLESS STATED.	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:			DEBURR AND BREAK SHARP EDGES	अंतर विश्वविद्यालय त्वरक केंद्र Inter-University Accelerator Centre - (IUAC)
	NAME	SIGNATURE	DATE			TITLE:
DRAWN	THOMAS		16/04/2024			COIL
APPVD	G.RODRIGUES					
MFG						
Q.A.						
				MATERIAL: OFHC COPPER		DWG NO. IUAC/CYCLO/08 A3
				WEIGHT:		SCALE:1:5 SHEET 1 OF 1

QUANTITY:1



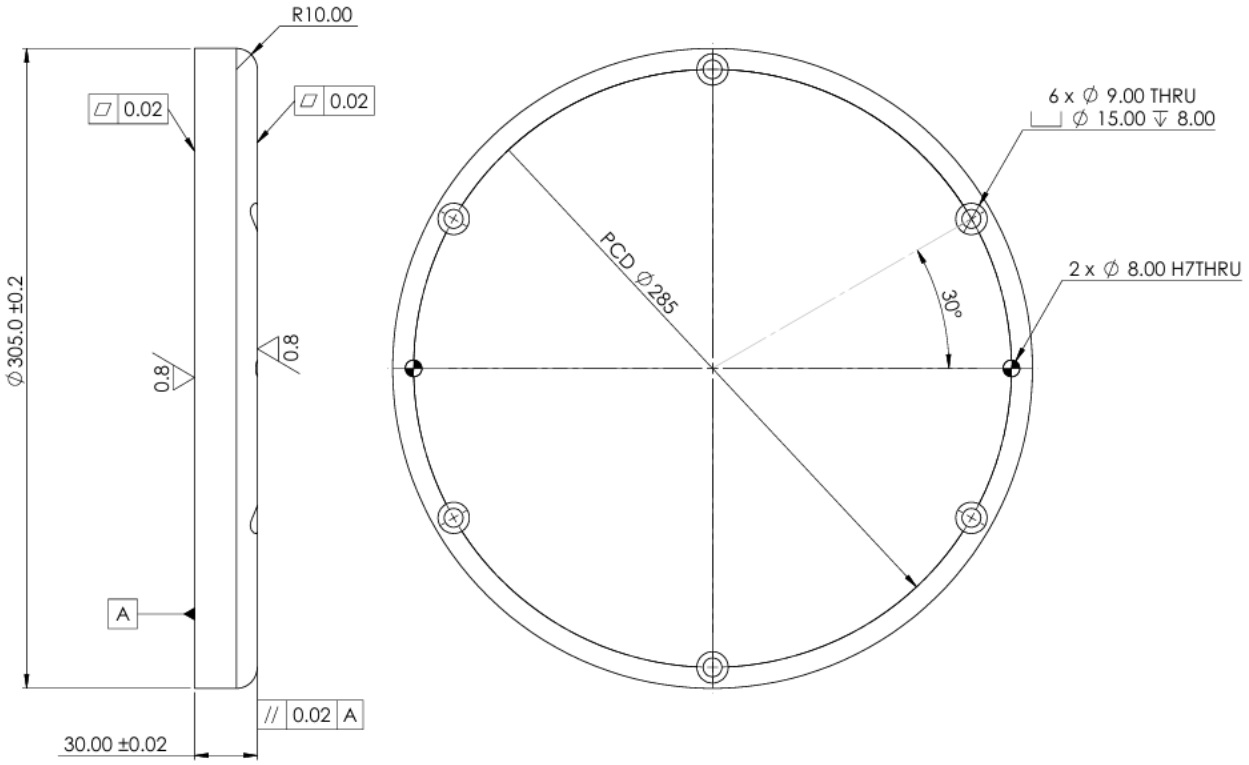
Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish 3.2 ▽ unless specified
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)

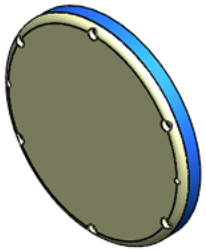
GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED IS ±0.02 (MEDIUM CLASS)

LINEAR TOLERANCE		LENGTH OF SHORTER SIDE OF ANGLE		SURFACE FINISH
UPTO 6	±0.1	UPTO 10	±1°	1. SURFACE FINISH TO BE 0.8 Ra MAX ON VACUUM SEALING FACES.
6 - 30	±0.2	10 - 50	±0°30'	2. ALL OTHER SURFACE FINISH TO BE 3.6 Ra MAX UNLESS STATED.
30 - 120	±0.3	50 - 120	±0°20'	3. VACUUM SURFACES MUST BE MECHANICALLY CLEANED AND BUFFED AND DEGREASED WHEREVER POSSIBLE.
120 - 400	±0.5	120 - 400	±0°10'	4. FINAL PRODUCT MUST BE ELECTRONIC GRADE ULTRASONICALLY CLEANED FOR BETTER VACUUM.
400 - 1000	0.8	OVER 400	± 0°5'	
1000 - 2000	±1.2	1. ALL DIMENSIONS ARE IN MILLIMETERS. 2. REMOVE ALL SHARP CORNERS AND BURRS BY 0.5X45° MAX UNLESS STATED. 3.TOLERANCE FOR ANGULAR DIMENSIONS ± 0.5° UNLESS STATED.		
2000 - 4000	±1.8			

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	FINISH:		DEBURR AND BREAK SHARP EDGES	अंतर विश्वविद्यालय त्वरक केंद्र Inter-University Accelerator Centre - (IUAC)
	NAME	SIGNATURE	DATE	TITLE: POLE
DRAWN	Thomas V		11/03/2024	
APPVD	G.Rodrigues			
MFG				
Q.A				
MATERIAL: Magnet Steel-AISI-1010				DWG NO. IUAC/CYCLO/09 — A3
WEIGHT: 126 Kg				SCALE:1:3 — SHEET 1 OF 1

QUANTITY:02 NOS



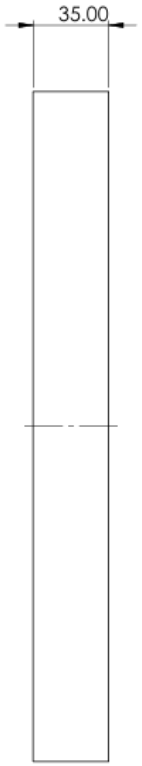


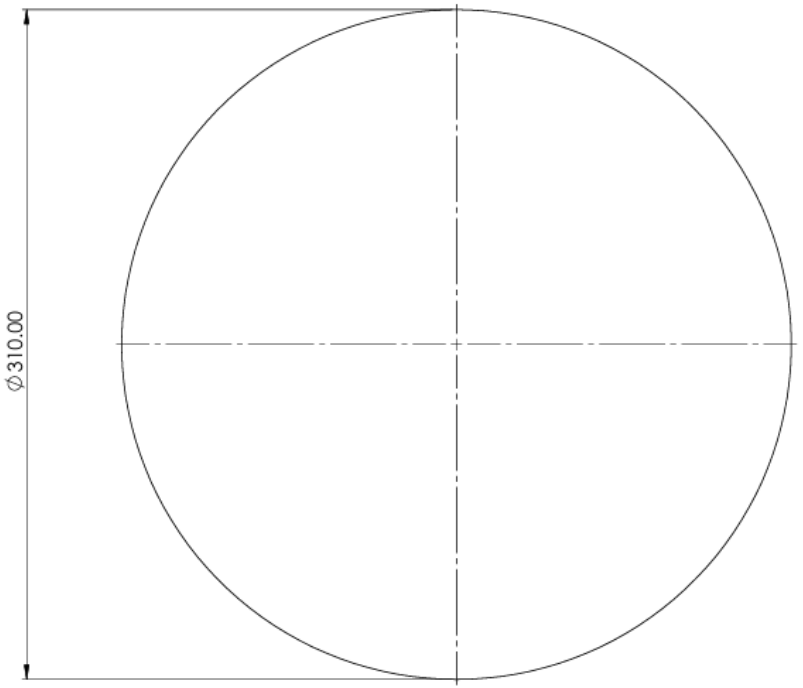
Note:
1. All dowel position tolerance ⌖ 0.02
2. All surface finish 3.2 ▽ unless specified
3. Paint RAL 5010 (Blue) -Gloss
4. No paint on magnet joint surfaces and threads.(Apply only Anticorrosion oil)

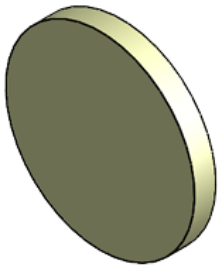
GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED IS ISO2768(MEDIUM CLASS)

LINEAR TOLERANCE		ANGULAR TOLERANCE OR SHORTER SIDE OF ANGLE		SURFACE FINISH
UPTO 6	±0.1	UPTO 10	±1°	1. SURFACE FINISH TO BE 0.8 ᵘm MAX ON VACUUM SEALING FACES.
6 - 30	±0.2	10 - 50	±0°30'	2. ALL OTHER SURFACE FINISH TO BE 1.6 ᵘm MAX UNLESS STATED.
30 - 120	±0.3	50 - 120	±0°20'	3. VACUUM SURFACES MUST BE MECHANICALLY CLEANED AND BUFFED AND DEGREASED WHEREVER APPLICABLE.
120 - 400	±0.5	120 - 400	±0°10'	4. FINAL PRODUCT MUST BE ELECTROPOLISHED/ULTRASONICALLY CLEANED FOR BETTER VACUUM.
400 - 1000	±0.8	OVER 400	±0°05'	
1000 - 2000	±1.2	1.ALL DIMENSIONS ARE IN MILLIMETERS. 2. REMOVE ALL SHARP CORNERS AND BURRS BY 0.5X45° MAX UNLESS STATED. 3.TOLERANCE FOR ANGULAR DIMENSIONS ± 0.5° UNLESS STATED.		
2000 - 4000	±2.0			

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:		DEBURR AND BREAK SHARP EDGES	अंतर विश्वविद्यालय त्वरक केंद्र Inter-University Accelerator Centre - (IUAC)
	NAME	SIGNATURE	DATE		TITLE: POLE TIP-1
DRAWN	Thonas V		11/03/2024		
APPVD	G.Rodrigues				
MFG					
Q.A					
MATERIAL: Magnet Steel-AISI-1010				DWG NO. IUAC/CYCLO/10	A3
WEIGHT: 17 Kg				SCALE:1:5	SHEET 1 OF 1







QTY: 02 NOS

GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED IS 2.002 (MEDIUM CLASS)

LINEAR TOLERANCE		LENGTH OF SHORTER SIDE OF ANGLE		SURFACE FINISH
UPTO 6	±0.1	UPTO 10	±1°	1. SURFACE FINISH TO BE 0.8 Ra MAX ON VACUUM SEALING FACES.
6 - 30	±0.2	10 - 50	±0°30'	2. ALL OTHER SURFACE FINISH TO BE 1.6 Ra MAX UNLESS STATED.
30 - 120	±0.3	50 - 120	±0°20'	3. VACUUM SURFACES MUST BE MECHANICALLY CLEANED AND BUFFED AND DEGREASED WITH ISOPROPYL ALCOHOL.
120 - 400	±0.5	120 - 400	±0°10'	4. FINAL PRODUCT MUST BE ELECTRONIC GRADE FILTRATION EASILY CLEANED FOR BETTER VACUUM.
400 - 1000	±0.8	OVER 400	±0°5'	
1000 - 2000	±1.2			
2000 - 4000	±2.0			

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. REMOVE ALL SHARP CORNERS AND BURRS BY 0.05R² MAX UNLESS STATED.
3. TOLERANCE FOR ANGULAR DIMENSIONS ±0.5° UNLESS STATED.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	FINISH:
DEBURR AND BREAK SHARP EDGES	

अंतर विश्वविद्यालय त्वरक केंद्र
Inter-University Accelerator Centre - (IUAC)

	NAME	SIGNATURE	DATE
DESIGN	Thomas V		12/03/2024
DRAWN	Thomas V		
APPV'D	G.Rodrigues		
MFG			
Q.A			

TITLE: POLE TIP-SPARE

MATERIAL: Magnet steel-AISI-1010

WEIGHT: 15 Kg

DWG NO. IUAC/CYCLO/11

A3

SCALE:1:5

SHEET 1 OF 1