Government of India
Bhabha Atomic Research Centre
Metallic Fuels Division

Ref: MFD/SR/2022/04/P29379 Date: 18/02/2022

To,

Dear Sir,

We request you to submit your quotation for **"Fabrication, supply, delivery and guarantee of materials and systems for commissioning of equipments and instruments (like jaw crusher, 50 ton hydraulic press, picture framed sandwich welding fixture with autorotation etc.) inside stainless steel housing under controlled dynamic flow of inert gas. The scope also includes mechanical and electrical subsystem for making control panel for the dewaxing furnace (Details of sub systems, parts, technical specifications are enclosed in Annexure-I)."**

Yours Faithfully,

Shilpa

(Shilpa Raj)
Scientific Officer (C)

Encl.: 1.Annexure (7 pages)

ANNEXURE-I

SCOPE:

"Fabrication, supply, delivery and guarantee of materials and systems for commissioning of equipments and instruments (like jaw crusher, 50 ton hydraulic press, picture framed sandwich welding fixture with autorotation etc.) inside stainless steel housing under controlled dynamic flow of inert gas. The scope also includes mechanical and electrical subsystem for making control panel for the dewaxing furnace (Details of sub systems, parts, technical specifications are enclosed in Annexure-I)."

Bidder Qualification: In order to qualify the bidder to participate in this tender, it is mandatory that the bidder has some prior experience in fabrication of materials and systems for commissioning of equipments and instruments (like jaw crusher, 50 ton hydraulic press, picture framed sandwich welding fixture with autorotation etc.) inside stainless steel housing under controlled dynamic flow of inert gas. And also on mechanical and electrical subsystem for making control panel for the dewaxing furnace. Therefore, the bidder is required to submit necessary documentation/proof (Purchase Orders, Work Orders, and Contract etc.) where he has been awarded the contract by any government agencies only for similar kind of work. It is also desired that the bidder must also demonstrate by submitting documents demonstrating the timely completion of such contracts/work within stipulated time frame. In order to qualify it is also required that bidder must have completed minimum 5 number of tenders/work contracts in the last 2-year duration on jobs related to fabrication of materials and systems for commissioning of equipments and instruments (like jaw crusher, 50 ton hydraulic press, picture framed sandwich welding fixture with autorotation etc.) inside stainless steel housing under controlled dynamic flow of inert gas. And also on mechanical and electrical subsystem for making control panel for the dewaxing furnace.

SCOPE OF SUPPLY

The scope includes the delivery and commissioning of the items mention in the table below:

Sr. No.	Item Description	Material & Specification	Std Item / Drawing Reqd	Ttl QTY of Mtl. Reqd
1	Lam. Gl. Panels with 6nos. Holes (914x1120) (6 holes)	Laminated Glass Panel	A4-BARC/NFG/ESS/1044	2nos.
2	Lam. Gl. Panels with 4 nos. holes (914x914)(4 holes	Laminated Glass Panel	A4-PCF/M-997	2nos.
3	Lam. Gl. Panel (651x231) (Blank) (For Light)	Laminated Glass Panel	A4-PCF\M-759 4/5	2 nos.
4	U Gasket for Lam. Gl. Panel (914x1120)		Standard Item	2nos
5	U Gasket for Lam. Gl. Panel (914x457	As per Drawing	Standard Item	6nos
6	U Gasket for Lam. Gl. Panel (914x914	Neoprene	A4-BARC/NFG/ESS/1062	20nos.
7	U Gasket for Lam. Gl. Panel (914x457	Neoprene	A4-PCF\M-1017	6nos
8	U Gasket for Lam. Gl. Panel (651x231	Neoprene	A4-PCF\M-998	12nos.
9	Metallic Side Panel (914x914)	SS	A2-BARC/NFG/ED&DD/1135 A2-BARC/NFG/ED&DD/1136	6nos
10	Metallic Side Panel (914x457)	SS	A3-BARC/NFG/ED&DD/1223	4nos
11	Ø 8" Glove Port	SS	A4-PCF/M-1014	24nos.
12	Ø 8" U Gasket	Neoprene	Drawing Required	40nos.
13	Ø 6" U Gasket	Neoprene	Drawing Required	14nos.
14	Ø 10" Bung	SS	A2-BARC/NFG/ED&DD/1116	16nos.
15	Ø 8" Bung	SS	A3-BARC/NFG/ED&DD/1120	46nos.
16	Ø 6" Bung	SS	A3-BARC/NFG/ED&DD/1120	36nos.
17	O' Ring for 10" Bung	Neoprene	Standard Item	16nos.
18	O' Ring for 8" Bung	Neoprene	Standard Item	40nos.
19	O' Ring for 6" Bung	Neoprene	Standard Item	50nos.
20	Ø8" Neoprene Gloves	Neoprene	Standard Item	46nos.
21	Ø6" Neoprene Gloves	Neoprene	Standard Item	36nos.
22	PRV 1"NB	To be Fabricated	BARC/MRG/ED&DD/1346	8nos
23	HEPA Filter	Std	A3-BARC/NFG/ED&DD/1148	12nos.
24	Ball Valve 1"NB	Brass/SS	Standard Item	14nos.
25	Ball Valve 1/2"NB	Brass/SS	Standard Item	2nos
26	Solenoid Valve 0-9bar	Std	Standard Item	2nos
27	Rotameter 0-200cc	Std	Standard Item	6nos
28	Threaded Union for Rotameter	To be Fabricated	Drawing Required	8nos
29	Instrument Panel	Aluminium	Drawing Required	6nos
30	Pr. Gauge 0-4'	Magnehalic Pr. Gauge	Standard Item	6nos
31	Pr. Gauge -2 to +2'	Magnehalic Pr. Gauge	Standard Item	6nos
32	Pressure Switch	Std	Standard Item	6nos
33	SS Elbow 1"NB	ASTM	Standard Item	40nos.
34	Threaded Union 1"NB	To be Fabricated	A3-PCF/M-939	30nos.
35	Vacuum Union 1"NB	To be Fabricated	A3-PCF/M-917	30nos.
36	SS Pipe 1/2"NB Sch40	ASTM	Standard Item	20mtrs
37	SS Elbow 1/2"NB	ASTM	Standard Item	30nos.
38	1/2" Copper tube	Copper	Standard Item	30mtrs
39	1/2" Brass Connector	Brass	Standard Item	45 no.
40	1/2" Tee Connector	Brass	Standard Item	5nos
41	1/4" Copper tube	Copper	Standard Item	30mtrs
42	1/4" Brass Connector (with ferule & nut	Brass	Standard Item	20nos.
43	Transfer Tunnel (250mm length)	SS	A3-BARC/NFG/ESS1046-2	8nos
44	SS Allen Screw M6x15 lg	SS	Standard Item	50nos.
45	Cover for Electric Glands	SS	A2-BARC/NFG/ED&DS/1071	14nos.
46	O' Rings for Stubcloser	Neoprene	Standard Item	120nos.
47	Flanges for Header Connection	To fab as per hdr connectn	Drawing Required	5nos
48	SS Filter Casing Assembly	SS	Standard Item	1nos
49	HEPA Filter Cartridge		Standard Item	3nos
50	Vacuum Union 1/2" NB	SS	Standard Item	5nos
51	O' Rings for 10" Bung	Dia-12mmx ID-274mm/ Dia-2.62xID-18.71	Standard Item	16nos
52	O' Rings for 8" Bung	Dia-12mmx ID- mm / Dia- 2.62xID-18.72	Standard Item	40nos.
53	O' Rings for 6" Bung	Dia-12mmx ID- mm / Dia- 2.62xID-18.72	Standard Item	40 nos.
54	O' Ring for Tunnel	Dia- mmx ID- mm	Standard Item	16nos
55	O' Ring for Threaded Union 1"NB	Dia- mmx ID- mm	Standard Item	50nos.
56	O' Ring for Threaded Union of Rotameter	Dia- mmx ID- mm	Standard Item	20nos.
57	O' Ring for Vacuum Union 1" NB	Dia- mmx ID- mm	Standard Item	50nos.
58	O' Ring for Vacuum Union 1/2" NB	Dia- mmx ID- mm	Standard Item	50nos.
59	O" Rings for Filter Cartridge Assembly	Dia- mmx ID- mm	Standard Item	10nos.

Further, the connection of seven number of Glove box with header line at a pressure of -10"WC shall be in the scope of this work. Scope of supply also include leak testing of seven glove boxes already present at the site.

The procedures for leak testing of the glove boxes is detailed below. This shall be strictly adhered to no deviation from these standards shall be tolerated.

LEAK TESTING (Procedures for leak testing)

Procedure: 1

The assembly and leak testing of the glove box shall be done in a clean closed room, free from any severe fluctuations of temperature. Special care shall be taken to clean the gasketing surface with alcohol or some other suitable solvent. All gaskets and "O" rings shall be fitted after application of a thin layer of silicone vacuum grease as sealant. All the sides and top shall have glass panels. All panels shall be tightened uniformly, the "O" rings/gaskets not being compressed more than 0.5 mm overall. All tubes, pipes and other outlets on the box shall be properly closed using suitable stoppers/rubber corks. The assembled box shall be evacuated by a pump/blower, to negative pressure of not less than 4" water gauge. Readings shall be taken at one-hour or half an hour interval to record the changing temperature and differential pressure over a period of 24 hours. Leak test records and calculation for the glove box is to be preserved till the assembly is delivered. The same shall be updated in the data record folders supplied with individual number of the fabricated glove box/fume hood. However, it is to be noted that the glove box design pressure is not less than negative 10" water gauge.

Testing of glove box at negative 4" water column, hold time shall be at least 24 hrs or better without temperature consideration. If temperature correction is considered then, the hold time can be considered for 6 hrs and calculations can be done, accordingly.

The leak rate shall be determined from the pressure rise inside the glove box after taking into account the pressure fluctuations due to change of temperature of the air in the box. A centigrade thermometer graduated at 0.1°C and with a range of 0-50°C shall be placed inside the glove box to record the temperature change. The average temperature corrected leak rate of the fully assembled box over a period of 24 hours shall be equal to or lower than 0.05% of the box volume of air/argon gas per hour.

The preliminary leak test of the glove box shall be carried out by the manufacturer. In case, leak is found to be high, the contractor shall detect the leaking areas by approved methods and re-work on the assembly till the tests meet the requiremen.t. **No putty, M-seal etc is permissible for closure of any leakages.**

Procedure: 2

The glove boxes are warranted in class 1 (ISO 10648-2) and tested through oxygen probe detection method. The leak rate criteria for the acceptance shall be same.

Note: **The leak rates shall be evaluated for all the glove boxes.**

General Requirement:

a. The fabrication of the accessories of the glove boxes demands the highest standard of workmanship, particularly from the sheet metal worker and the welder. The desired finish and the leak-tightness of the GLOVE BOX, as specified by us, shall be of primary concern and as per certified tightness according to class 1 ISO 10648-2 and preferred leak rates shall be better than 0.05% box volume of air/hour. Any lowering of standards of workmanship, finish and the flatness in gasketting surface area will be evident in the final leak tests and thus, it is in the manufacturer's interest to ensure a high standard of workmanship and supervision.
b. After completing the fabrication and installation the entire site should be properly cleaned.

c. **Unless otherwise specified all the material to be used is SS 304L and surface finish by mechanical polishing should be 0.3 < Ra < 0.35, which is equivalent/better than M3 buffed surface**.

d. All SS fittings viz aligning connections, elbows, tees, reducers, etc. shall be welded by certified welding process.

e. Workmanship shall be in accordance with high-grade practice and adequate to achieve the accuracy and finish mentioned in the drawings. All sheet metal and structural work shall be of high quality. All rounded corners and channels in the box frame shall be made of defect-free pressings and shall have radius strictly as per drawings.

f. Gasketting surface area on the glove box frame where panels will seat shall confirm to specified size and shape of polycarbonate view panels. In addition, they shall be finished smooth by grinding and shall be absolutely free from steps, pits, dents, scratches and spatters of weld metal. Adequate care shall be taken up to keep the box flat within the range of 0.5 mm and free from any waviness.

g. In general, the number of welded joints should be reduced to a minimum utilizing the available sheet areas fully. Any route can be chosen for glove box sheet metal fabrication for main frame. Fabrication of glove box with trough design is acceptable to reduce the welding. Thus, chances of distortion can be minimized. **Welding of the main frame sheet of the glove boxes should be avoided at the bottom. The supplier shall ensure the approval of fabrication drawings before start of fabrication.**

h. The diagonal measurements of the various faces of the box frame shall remain within specified tolerance (ASME boiler pressure vessel code) as shall be applicable unless specified otherwise.

MACHINING:

In general, machining shall be as specified. Care shall be taken to ensure that chatter marks, scratches and burrs are removed from the machined surfaces. All sharp corners are to be rounded off inside glove box and wherever possible at outside also. All tolerances, sizes and finishes shall be as per the approved drawings. Surface finish: mechanical polishing: 0.3 < Ra < 0.35

WELDING:

Glove boxes should be made by certified welding process preferably by TIG process. Welding procedure to be followed shall be recorded in detail and qualified as per ASME Section IX. Welding procedure qualification shall be carried out in accordance with ASME Section IX. If fillet welding is being used, ASME Section IX QW-183(Macro-Micro) should also be met for welding qualification. This test ensures the weld is clear from cracks and lack of fusion. Visual examination of the cross sections of the weld metal and heat affected zone shall show complete fusion and freedom from cracks.

In general the fabricator/supplier shall ensure the approval of Welding Procedure Specification (WPS)/ Procedure Qualification Record (PQR) and welder qualification. These have to be evolved separately against this purchase order.

INSPECTION AND TESTING:

User department shall have access at all reasonable times to all shops and the sub-contractors where material is being fabricated and assembled and all reasonable facilities for such inspection shall be provided in mutually agreeable time. A certificate shall be issued along with each glove box including inspection records and test results. The detailed QAP shall be

prepared and submitted by the manufacturer (Department's QAP is indicative only for reference) for approval and the inspection shall be carried out as per the approved QAP.

i) Inspection of Raw Materials

The bidder shall assure that all materials used comply with the requirements of respective codes. The mill test reports (for chemical and physical properties) in correlation with material markings shall be provided for review. The same shall be approved before fabrication starts.

All the raw materials to be used in fabrication such as plates, forgings, tubes, bars etc., should be ultrasonically examined for defects.

For S.S.304L, the bidder should perform IGCT (inter granular corrosion test/ sensitization test) on all feed stock and present the results for verification. IGCT as per ASTM, Practice (A) & practice (E), if required will also be performed at the users end and coupons for the same should be made available to the department from all the feed material stock.

The fabricator should submit the chemical and mechanical test reports of the feed material to the user for verification/ acceptance.

General:

No change in price of the alloy shall be allowed. The payment shall only be made at the fixed price as mentioned in the quotation supplied by the supplier.

You shall send your offer in a sealed envelope (**strictly by registered post/Speed post only**) indicating delivery period, price inclusive of taxes and other relevant information, to:

Shilpa Raj
Metallic Fuels Division
Bhabha Atomic Research Centre
Trombay,
Mumbai 400 0085

Quotation shall reach us by speed post/register post only on or before **28/02/2022** before **11.30 hrs.**
Please send "REGRET" if not quoting.
On top left corner of the sealed envelope please indicate

"Fabrication, supply, delivery and guarantee of materials and systems for commissioning of equipments and instruments (like jaw crusher, 50 ton hydraulic press, picture framed sandwich welding fixture with autorotation etc.) inside stainless steel housing under controlled dynamic flow of inert gas. The scope also includes mechanical and electrical subsystem for making control panel for the dewaxing furnace (Details of sub systems, parts, technical specifications are enclosed in Annexure-I)."

All applicable taxes should be clearly mentioned.

- Overwriting, scratching etc. must be avoided in the quotation. Rewriting the whole figure shall carry out any alteration in the figure. The authorized person from the firm shall countersign such figure.

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DELIVERY PERIOD:

- The Work completion period mentioned in the quotation shall be strictly adhered to. If the contractor fails to complete the work before "work completion period" mentioned in the contract or secure extension work completion date before effecting work completion schedule of the supply against the contract, acceptance of such item by the purchaser shall in no way prejudice the right of the purchaser to levy liquidated damage nor shall it be entitled to the contractor for payment of statutory levies that comes into force after the expiry of the work completion date.

- Any delay on part of the contractor is liable to for penalty @ ½ % per week (max 10%) to be imposed to the contractor. Validity period of offer should be more than 60 days.
- Early delivery schedule shall be given a consideration.
- Guarantee / Warranty of the material supplied for one year.
- For any Enquiry and clarifications you may contact the following persons Miss Shilpa Raj (025593929/02225593929).

PLACE OF DELIVERY:

- The inspected and accepted assemblies shall be delivered to:

Stores Officer
Radiological Zonal Stores
Bhabha Atomic research centre
BOMBAY 400 085

INSPEPCTION AND TESTING:

The purchaser will have access at all reasonable times to all shops of the contractor and the sub-contractors where material is being fabricated and assembled and all reasonable facilities for such inspection shall be provided. Prior to the supply of item the manufacture has to get it approved from the purchaser.

PAYMENT TERMS:

Full payment will be made only after the satisfactory completion of Work order and delivery **"Fabrication, supply and guarantee of solution annealed and precipitation hardened Aluminium-Magnesium-Silicon alloy complying to ASTM B 209 standard specifications in flat and cylindrical geometry as per the details mentioned in Annexure-I)."**

•Two copies of Invoice, in the name of,
Director,
Nuclear Fuels Group,
Bhabha Atomic Research Centre,
Mumbai 400085.

- Advance Stamp Receipt
- A copy of cancelled cheque
- Company's GSTIN No. & PAN No. should be furnished along with the bill.
- Company's copy of Sales Tax /Service Tax Registration Certificate has also to be furnished along with the bill.
- Company's copy of GST registration/ Certificate to the effect of GST payment has also to be furnished along with the bill.
- ITR Undertaking with acknowledgement for last two years.
- Option form for payment through ECS/RTGS with pre-stamped receipt.
- Guarantee / Warranty of the material supplied should be for one year.
- Note: The Tax Invoice should specifically indicate the following:

- GSTN
- PAN
- Location of Supply
- Tax Component to be separately indicated in the invoice
- Undertaking that the GST has been promptly deposited with the authorities

Please note that, income tax @ 2% and GST TDS@2%, will be deducted from your bill.
No part payment or advance payment will be made.
You may contact Miss Shilpa Raj (25593929) for any clarification.

TAXES:

- All applicable taxes should be clearly mentioned. Overwriting, scratching etc. must be avoided in the quotation. Rewriting the whole figure shall carry out any alteration in the figure. The authorized person from the firm shall countersign such figure.

DELAY CLAUSE:

Any delay which is attributable to the contractor is liable for penalty @0.5% per week (max. 10%) to be imposed on the contractor.

CONFIDENTIALITY:

No, party shall disclose any information to any third party, concerning the matters under this contract generally. In particular, any information identified as "Proprietary" in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force. "Restricted information" categories under section 18 of the Atomic Energy Act, 1962 and "official Secrets" under section 5 of the official secrets act, 1923:- Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation. Prohibition against use of BARC's name without permission for publicity purposes:- The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC's name for any publicity purpose through any public medial like press, radio, T.V. or Internet without the prior written approval of BARC.

Shilpa Raj
Scientific officer (C)
(On behalf of the President of India)