

भारत सरकार  
Government of India  
भाभा परमाणु अनुसंधान केन्द्र  
Bhabha Atomic Research Centre  
चूर्ण धातुकी प्रभाग  
**Powder Metallurgy Division**

वाशी कॉम्प्लेक्स /Vashi Complex,  
नवी मुंबई/Navi Mumbai - 400 703  
दूरभाष/Tel : 2788 7194/7182  
टेली फैक्स /Tele Fax: 2784 0032  
Email: sneharb@barc.gov.in

संदर्भ Ref.: पीएमडी/PMD/निविदा माँगपत्र/Tender Inv/ 2022/ 34071/ 2022/ PMD

दिनांक/Date: 11 March, 2022

**TENDER INVITATION**

**विषय/Sub: Supply, installation, and testing of gas conditioning and measuring system as per Annexure I, at PMD, BARC, Vashi Complex. - 01 Job.**

प्रिय महोदय/ Dear Sir,

चूर्ण धातुकी प्रभाग, वाशी कॉम्प्लेक्स, नवी मुंबई-४००७०३ में निम्नलिखित संविचरण/ मरम्मत कार्य के लिए अधोहस्ताक्षरी द्वारा भारत के राष्ट्रपति की ओर से कोटेशन आमंत्रित करते हैं। कार्य का स्वरूप निचे दिया गया है।

For & On behalf of the President of India, quotations are invited by the undersigned for following fabrication /repair /AMC work to be carried out at Powder Metallurgy Division, Vashi Complex, Navi Mumbai- 400 703. The scope of work is detailed below.

**Supply, installation, and testing of gas conditioning and measuring system as per Annexure I, at PMD, BARC, Vashi Complex. - 01 Job.**

कोटेशन सीलबंद लिफाफे में, जिसके ऊपर कार्य का स्वरूप लिखा जाना चाहिए, निर्धारित तारीख एवं समय तक निम्नलिखित व्यक्ति के पते पर पहुँच जाना चाहिए।

The quotation in sealed cover should be superscribed as “**Supply, installation, and testing of gas conditioning and measuring system as per Annexure I, at PMD, BARC, Vashi Complex. - 01 Job.**” and should be addressed to following person and should reach him/her by **Speed Post/Registered Post** through Indian Postal Service only on or before the date and time mentioned below.

**Sneha G. Kotkar(SO/D),**  
चूर्ण धातुकी प्रभाग, भापअकें, वाशी संकुल, नवी मुंबई  
Powder Metallurgy Division, BARC, Vashi Complex,  
Navi Mumbai 400 703

दिनांक \_\_\_\_\_ को या इससे पूर्व \_\_\_ बजे  
तक  
On or before 24/03/22 at 15.00  
hrs.

**निविदाकार के लिए आदेश Instructions to the tenderer :**

निविदाकार बताई गई दरों को अंको सहित अक्षरों में, **पैन संख्या** तथा **जी.एस.टी.** भी लिखें। सभी सुधारों को निविदाकार द्वारा तारीख के साथ अनुप्रमाणित किया जाना चाहिए।

The tenderer should write in words as well as figures, the rate(s) quoted by him, PAN No & GST No should be mentioned on the tender. All corrections must be attested by the dated initials of the tenderer.

निविदाकार कृपया नोट करें कि यदि उसे कार्य प्रदान किया जाये तो बीएआरसी/ ब्रिट कॉम्प्लेक्स, नवी मुंबई के भीतर कार्य करने के लिए तैनात कर्मचारियों हेतु पुलिस सत्यपा प्रमाण पत्र प्रस्तुत करना होगा।

The tenderer may note that in case the work is awarded to him, he has to produce police verification certificate for the employees to be deputed for the work inside the BARC/BRIT complex, Navi Mumbai.

आयकर और उसपर लागू अधिभार बिल से काटा जायेगा। दिए गए कार्य के लिए लेखा प्रभाग द्वारा भुगतान दिया जायेगा बशर्ते की कार्य संतोषजनक रूप से दो माह के अंदर पूरा किया गया हो।

Income-Tax and surcharge on income-tax as applicable shall be deducted from the bill. The payment for the work done shall be paid by our Accounts Division only on satisfactory completion of the work within one month.

कार्य पूरा करने के लिए **60 days** की अवधि स्वीकार्य है। यह अवधि कार्य आदेश जारी की तारीख से प्रारंभ होगी।  
The time allowed for completion of the job is 60 days. The same shall be reckoned from the date of issue of the work order.

निविदा की स्वीकार्यता अधोहस्ताक्षरी पर निर्भर है तथा बिना कोई कारण बताये अस्वीकार करने का अधिकार सुरक्षित रखता है।

The acceptance of the tender rests upon the undersigned with a right to reject the tender without assigning any reason.

**टिप्पणी/Note:** निविदाकार को ऑफर देने के पूर्व कार्यस्थल का मुआइना करना होगा ताकी संबद्ध कार्य का परिमाण पूरी तरह समझ सके।

The tenderer must visit to work site at PMD Vashi Complex prior to making an offer, in order to clearly understand the quantum of job involved.

सधन्यवाद Thanking you,



भवदीय/ Your's faithfully  
Sneha G. Kotkar/ स्नेहा कोतकर  
SO/D, PMD

## Annexure - I

### SCOPE OF WORK

#### **Supply, installation, and testing of gas conditioning and measuring system as per Annexure I, at PMD, BARC, Vashi Complex. – 01 Job**

Hydrogen need to be separated and measured from a Steam-Hydrogen mixture at high temperature (600 oC) coming from an electrochemical reactor. The system includes Gas condition system, digital mass flow meter, mass flow controller and temperature monitoring system

- 1. Supply, Installation and Configuration of Gas Conditioning system having moisture trap, membrane based drier, refrigerant drying and heater to separate hydrogen from a mixture of steam and hydrogen at high temperature to room temperature ----- 01 Nos**

High temperature input stream passes through SS baffles first followed a tube type moisture exchanger (membrane tubes). Maximum sample gas flow rate is 4 lpm. Further, steam is separated by cooling the gas mixture to 5 degree centigrade using cooling system. After the separation, hydrogen is heated to room temperature for measurement. Inlet and outlet connections should be ¼" Swagelok compression fitting type.

- 2. Supply, Installation, Configuration and testing of Digital Mass flow meter and totalizer assembly (0-1000sccm range) which is calibrated for multiple gas (H<sub>2</sub>, Ar, N, He, Air) with integrated display. Alicat or equivalent make ----- 01 No.**

Specifications:

1. Range : 0 – 1000 sccm for H<sub>2</sub> gas
2. Accuracy : ± (0.8% of Reading + 0.2% of Full Scale)
3. Repeatability : ± 0.2% Full Scale
4. Zero Shift and Span Shift : 0.02% Full Scale / °C / Atm
5. Operating Range / Turndown Ratio : 0.5% to 100% Full Scale / 200:1 Turndown
6. Maximum Measurable Flow Rate : up to 128% Full Scale (Gas Dependent)
7. Response Time : 100 ms (Adjustable)
8. Warm-up Time : < 1 Second
9. Monochrome LCD Display with integrated touchpad

10. Should simultaneously displays Mass Flow, Volumetric Flow, Pressure and Temperature
11. Analog output : Selectable 4-20 mA or 0-5Vdc
12. Supply Voltage : 15 to 30 Vdc
13. To be supplied with power adapter and ¼" compression ferrule fitting.

**3. Supply, Installation, Configuration and testing of Mass flow controller calibrated for multiple gases (H<sub>2</sub>, Ar, N, He) for 0-200scm flow range with integrated display. Alicat or equivalent make ----- 01 No.**

Specifications:

1. Range : 0-200 sccm
2. Repeatability : ± 0.2% Full Scale
3. Zero Shift and Span Shift : 0.02% Full Scale /°C / Atm
4. Operating Range / Turndown Ratio : 0.5% to 100% Full Scale / 200:1 Turndown
5. Maximum Controllable Flow Rate : 100% Full Scale
6. Maximum Measurable Flow Rate : up to 128% Full Scale (Gas Dependent)
7. Typical Response Time : 100 ms (Adjustable)
8. Output : Analog 0-5 VDC/ 4-20 mA
9. Supply Voltage: 230 VAC
10. Precalibrated for H<sub>2</sub>, He, Ar and N gases
11. To be supplied with power adapter and ¼" compression ferrule fitting.

**4. Supply and testing of Thermocouple probe with multiple sensor in a single probe. Omega or equivalent make ----- 01 No.**

Specifications:

1. Thermocouple Type : K for a process temperature in the range 0 to 1150°C (32 to 2100°F)
2. Junction Type : Ungrounded
3. Probe Length : 18 in
4. Additional Feature : 10 Sensing Points
5. Sheath Material :316 Stainless Steel
6. Probe Diameter :0.187 in
7. Cable Insulation :PFA
8. Wire Gauge : 24 AWG
9. Cable Length : 40 in

*Susha*

10. Termination Connection Type : Miniature Connector

11. Colour Code Standard : ANSI (Standard)

**5. Supply and testing of 8-channel handheld thermocouple Thermometer/ Data logger. Omega or equivalent make ----- 01 No.**

Specifications:

1. Thermocouple Type : K, J, E, T, R, S, N, B
2. No. of channels : 8 channel
3. Usage Type : Handheld or desktop
4. Functions: type selection, data logging, hold, min and max value.
5. Logging interval : 2 sec to 24 hrs
6. Additional Feature : Having Analysis software and compatible with Win XP or Win 7/8/10 OS, CE, ROHS certified
7. Display: LCD double row display
8. Measurement Range: -200 °C to 1370 °C
9. Accuracy :  $\pm 0.8$  °C  $\pm 0.2$  °C
10. Resolution : 0.1 °C
11. Input Connection Type : Miniature Connector

**6. Supply and testing of Retractable type Thermocouple. Omega or equivalent make ----- 02 Nos.**

Specifications:

1. Thermocouple Type : K for a process temperature in the range 0 to 1150°C (32 to 2100°F)
2. Junction Type : Ungrounded
3. Probe Length : 18 in
4. Sheath Material :316 Stainless Steel
5. Probe Diameter :1/16 in
6. Cable Insulation :PFA
7. Cable Length : 24 in
8. Termination Connection Type : Miniature Connector
9. Colour Code Standard : ANSI (Standard)

*Sueha*

