Date: 21/08/2019

CORRIGENDUM TO TENDER NO
No: IISER/PUR/0240/VK-P/SP/19-20

Sub: Supply of Customized Seebeck & Resistivity Measurement.
Ref: Tender Enquiry No. 2019_IISRT_479275_1

The above-referred tender enquiry has been **RETENDERED** with amended technical specification as mentioned in Annexure 1

2.   Accordingly, the due date for submitting and date of opening of bids has been revised as given below:

> **Due date for submission**   : 04.09.2019 (3.00 PM)
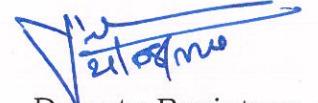> **Date of Opening**   : 05.09.2019 (3.30 PM)

3.   Bidders are requested to upload their technical specifications & compliance sheet taking into consideration the above amendment.

4.   All other terms and conditions remains same.

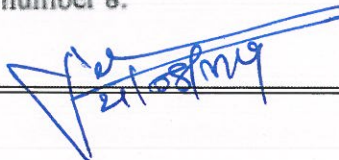Thanking You,

Yours Faithfully
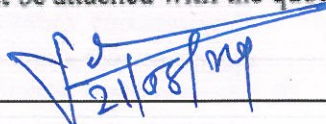
Deputy Registrar
Purchase & Stores

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Annexure 1 to Enquiry No.IISER/PUR/0240/VK-P/SP/19-20

Customized Seebeck and Resistivity Measurement System

1. Customizable, Compact design with small footprint.
2. Simultaneous measurement of the Seebeck coefficient and electrical conductivity.
3. Measurement method Seebeck coefficient : Static DC method.
4. Electric resistivity : Four-probe method
5. The equipment should be capable of measuring a wide range of materials, including semiconductors, metals and ceramics (including high resistance Oxide samples).
6. Fully automatic system provides a flexible and reliable experimental platform on which researchers can make their material measurements with very high precision even at high temperature.
7. Clearly mention the make, model and model number of the equipment being offered. (if any)
8. Temperature range : 300 – 1000 K or more, with stability of 50 mK or better. **User defined temperature gradient as well as step size.**
    (the system should be compatible with Keithley 6221 Current source, Keithely 2812 nanovoltmeter and Lakeshore 336 model temperature controller available with thermocouple option, meters not included)
9. The heaters used in the systems **should have small footprint for low power consumption.** Also, the design of the heater should ensure no spurious magnetic signals, like, either IR furnace or reverse heating current etc.
10. Measurement Atmosphere: oxygen and inert atmosphere.
11. Stainless steel vacuum chamber of appropriate design having minimum volume. Should reach 10^{-4} mBar or better with suitable turbo molecular pump (pump not included)
12. Sample size : min - max
    width : 3- 6 mm
    thickness : 3-6 mm
    Length: 8-15 mm
    For Thin film: substrate size length 8-16 mm, width 3-10 mm, thickness 0.5-1 mm
13. Power requirements 230 VAC maximum, single phase, 500 W maximum.
14. Specify water cooling if required: type of water (tap water or DI water) flow etc.
15. Provision of I-V measurements to confirm if the leads are in proper contact with a set sample(s) and ensure minimum contact resistance.
16. Thermo-EMF having a resolution: at least $\pm 7\%$
17. For Electrical conductivity / resistivity measurement should send Current through sample and measure Voltage between the leads.
18. Measurement controlled by a computer, permitting automatic measurement. The software should be user friendly and customizable, if required. Should allow simultaneous measurement of Seebeck as well as resisitivity. Future software upgrades cost should be mentioned, if any.
19. Measurement specifications : The system design should be able to achieve and accuracy at least $\pm 2\%$ for Seebeck coefficient and at least $\pm 5\%$ for electrical resistivity using the meters specified in point number 8.

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20. Software should be able to Export the data in ascii or txt or excel format. (A list of Thermoelectric properties measured and graphical display, data analysis etc offered by the software are to be specified)

21. All the neccessary accessories should be quoted.

22. For caliberation: Should provide standard materials sample. The measurement unit should be pre-calibrated. Specify extent of calibration required and traceability and validity of calibration at the time of installation. (Subsequent calibration requirements after the initial validity to be specified.)

23. The instrument should be compliant with international norms for safety and environment.

24. **The complete technical design along with all technical literature of the system should be supplied with the quote.**

25. The International research publications produced from the system can be added for supporting the calibration and accuracy of the instrument and design.

26. Installation, Commissioning and Training :
    a. The delivery should be considered complete only after successful commissioning of the instrument.
    b. The supplier should provide a prompt after-sales service such as regular instrument maintenance, troubleshooting and fixing.

27. Warranty for at least three years Or one year warranty with 2 years AMC beyond warranty period to be quoted.

28. Optional Items to be quoted with individual pricing.
    a. Low temperature attachement (77-300 K)
    b. Thin film attachment
    c. Spare Thermocouples or sensors
    d. Spare heaters
    e. Electrodes with leads
    f. Others as required

29. Additional optional accessories should be indicated separately along with their price. The above specs are desirable and the actual numbers achievable for your system should be indicated.

30. The quotation should include schematics of the equipment, specification sheet with detailed performance information and data published in internatioanl referred journals.

31. A complaince statement on all the above points must be attached with the quote.