



**NATIONAL INSTITUTE OF TECHNOLOGY  
ROURKELA-769008 (ODISHA)**

An Institute of National Importance under Ministry of HRD, GOI

**NOTICE INVITING TENDER**

**Tender Notification No: NITR/PW/CR/2018/66**

**Dated: 03/10/2018**

The National Institute of Technology, Rourkela invites bids from the eligible bidders for procurement of Fabrication and supply of high temperature gas permeability setup at NIT Rourkela

Last date of Submission of Bid : **30/10/2018 at 03:00 PM**

Date of opening of Technical Bid : **31/10/2018 at 03:00 PM**

**For Details:**

[http://nitrkl.ac.in/OldWebsite/Jobs\\_Tenders/9Equipment/Default.aspx](http://nitrkl.ac.in/OldWebsite/Jobs_Tenders/9Equipment/Default.aspx)

**Contact:** Prof. S.K Pratihar , Ceramic Engineering ; Ph: 0661-2462206;

Email: [skpratihar@nitrkl.ac.in](mailto:skpratihar@nitrkl.ac.in)

Bidding through: <https://eprocure.gov.in/eprocure/app>

**sd/-  
REGISTRAR**



**NATIONAL INSTITUTE OF TECHNOLOGY  
ROURKELA-769008, ODISHA**

**(TENDER NOTICE NO.:NITR/PW/CR/2018/66**

**Dated: 03/10/2018)**

Fabrication and supply of high temperature gas permeability setup as per our design and specification

Sl. No.	Description of Goods/Service	Quantity
01.	Fabrication and supply of high temperature gas permeability setup. (As per the specification mentioned in Annexure I).	01

Quantity required : **as mentioned above (All information provided in technical specification Annexure - I)**

Delivery : Within **120 days** from the date of purchase order

**Last Date of submission of Bid: 30/10/2018 at 03:00 PM**

**Date of opening of technical bid: 31/10/2018 at 03:00 PM**

1. The firm should not have been black listed at any time.
2. The submission of following bids by the tenderer should be through <https://eprocure.gov.in/eprocure/app> Please follow the guidelines as per the portal.

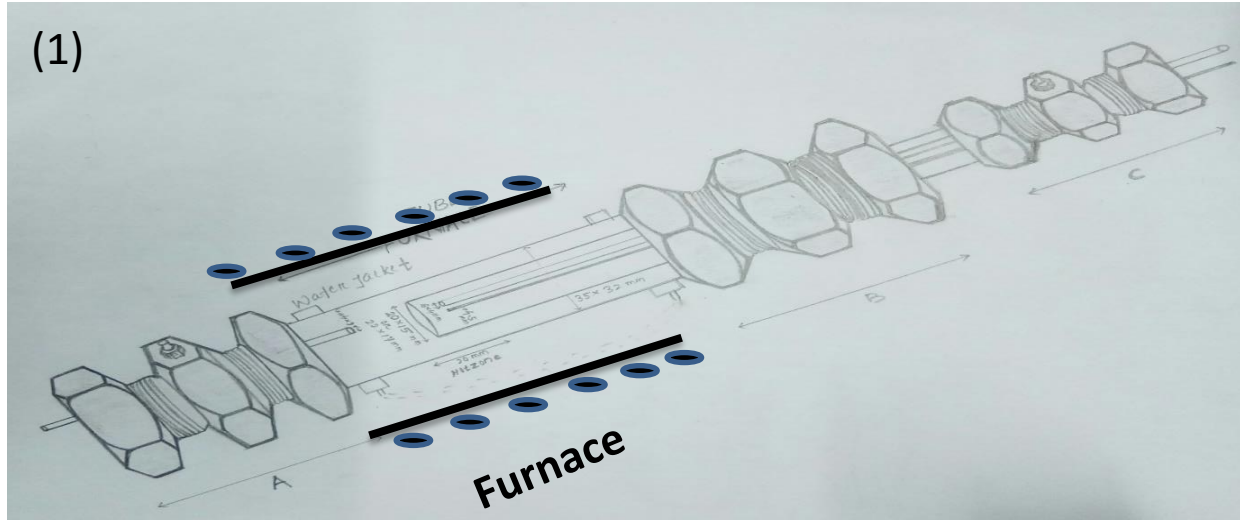
Tender for Fabrication and supply of high temperature gas permeability setup  
(Tender Notice No.: NITR/PW/CR/2018/66 dated: 03/10/2018) Due on  
30/10/2018 at 03:00 PM

3. **Liquidated damage clause** will be charged for any delay in supply of goods.
4. The validity of the tender shall be 120 days from the date of opening of the bids.
5. Detailed advertisement including all tender documents is also available in our website at [http://nitrkl.ac.in/OldWebsite/Jobs\\_Tenders/9Equipment/Default.aspx](http://nitrkl.ac.in/OldWebsite/Jobs_Tenders/9Equipment/Default.aspx) .
7. NIT reserves the right to qualify or deny prequalification of any or all applicants without assigning any reasons.

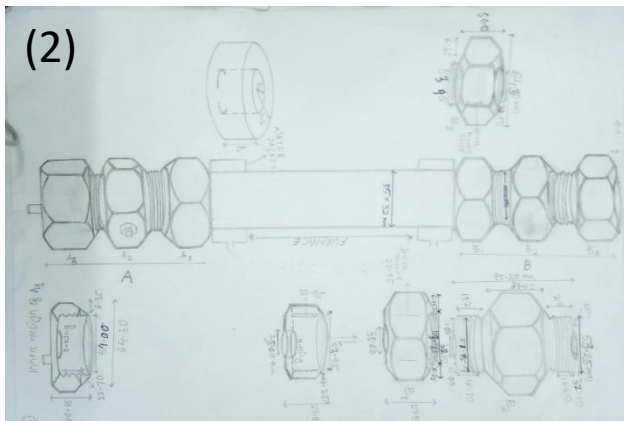
**(REGISTRAR)  
NIT, Rourkela  
Fax No- 0661-2462022  
Ph. No -0661-2472021**

**Technical Specification** of high temperature gas permeability setup.

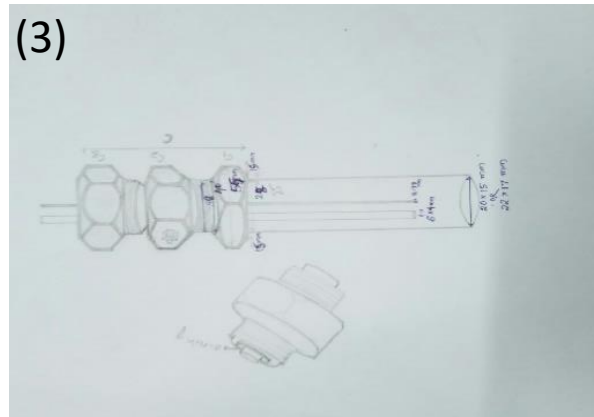
Schematic diagram of different parts are shown below:



**Fig-1.** Schematic diagram of high temperature gas permeability set up consists of  
**(I)** Tube furnace (Fig-1)  
**(II)** Furnace tube with accessories (Fig-2)  
**(III)** Permeability sample holder (Fig-3)



**Fig-2.** Furnace tube with accessories (made up permeability of quartz with inlet and outlet flanges A and B).



**Fig-3.** Schematic diagram of Sample holder consists of Alumina tube, Thermocouple sheath, gas inlet and outlet tube air tight flanges.



**Fig-4.** Typical gas tight flange arrangement to be used in different joints.

The system consists of

**(I) Tube Furnace:**

1. Tube Furnace complete with thyristor drive power supply PID controller/ indicator
2. Hot zone temperature 1000°C
3. Zone length 20-30 mm
4. Cold face temperature 150°C
5. Furnace tube made of quartz (capable to withstand 1100°C),  $\phi_{out}$  35 mm,  $\phi_{in}$  32 mm
6. Length of the furnace tube to be decided on the basis of hot zone and cold face temperature.
7. Water jacket for cooling on cold face of the tube and dimension should be on the basis of quartz tube  $\phi_{out}$  42 mm,  $\phi_{in}$  35 mm, length 50 mm.

**(II) Furnace tube with accessories:**

1. Airtight hex-flanges to be fitted on the quartz tube a) one set for Sweep gas inlet and outlet (A) of part I b) other set to be fitted with the quartz tube and permeability sample holder (B) of part I.
2. The Hex-flange A (hexagonal side 37 mm) consists of three parts A1, A2, and A3.
3. Part A2 is a hexagonal structure (side 37 mm and height 34.00 mm) with two projections one to be fitted with A3 and another to be fitted with A1. The projection to be fitted with A3, have height 20 mm (having 3 mm flash with thread up to 16 mm from the top which have 1 mm flash inside the projection must be fitted O-ring smoothly) with  $\phi_{out}$  54 mm. The projection to be fitted with A1 have height 28 mm (having 5 mm flash with thread up to 17 mm from the top which have 6 mm flash in the top of the projection must be fitted O-ring smoothly) with  $\phi_{out}$  54 mm. A2 have a central hole of 32.00 mm throughout it. The central part of A2 will have an opening for gas outlet fitted with push fit (0.5 inch).
4. Hex flange A1 height 28 mm will be used to join furnace quartz tube with Hex-flange A2 by O-ring coupling. This hex flange contains a central hole of outer diameter 54 mm with threads up to 23 mm from top (to be fitted with A2) on one side. There will be another central hole of diameter 35 mm at the other side through which the quartz tube will pass.
5. Hex flange A3 height 41 mm will be used to join gas inlet pipe of outer diameter 6 mm with Hex flange A2 by O ring coupling. It will have a central hole of 54 mm containing thread up to 23 mm from the top (to be fitted with A2) on one side. The other side of the Hex flange A3 will be joined with a gas inlet tube (outer diameter 6 mm) by O-ring coupling.
6. The Hex-flange B (hexagonal side 37 mm) consists of three parts B1, B2, and B3.
7. Part B2 is a hexagonal structure (side 37 mm and height 34.00 mm) with two projections one to be fitted with B3 and another to be fitted with B1. The projection to be fitted with B3, have height 20 mm (having 3 mm flash with thread up to 16 mm from the top which have 1 mm flash inside the projection must be fitted O-ring smoothly) with  $\phi_{out}$  54 mm. The projection to be fitted with B1 have height 28 mm (having 5 mm

flash with thread up to 17 mm from the top which have 6 mm flash in the top of the projection must be fitted O-ring smoothly) with  $\phi_{out}$  54 mm. B2 have a central hole of 32.00 mm throughout it.

8. Hex flange B1 height 28 mm will be used to join furnace quartz tube with Hex-flange B2 by O-ring coupling. This hex flange contains a central hole of outer diameter 54 mm with threads up to 23 mm from top (to be fitted with B2) on one side. There will be another central hole of diameter 35 mm at the other side through which the quartz tube will pass.
9. Hex flange B3 height 50 mm will be used to Permeability tube of outer diameter 22 mm with Hex flange B2 by O-ring coupling. It will have a central hole of 54 mm containing thread up to 23 mm from the top (to be fitted with B2) on one side. The other side of the Hex flange B3 will be joined with a gas inlet tube (outer diameter 22 mm) by O-ring coupling.

### **(III) Permeability Sample Holder:**

1. The Hex-flange C (hexagonal side 23 mm) consists of three parts C1, C2, and C3.
2. Part C2 is a hexagonal structure (side 23 mm and height 21 mm) with two projections one to be fitted with C3 and another to be fitted with C1. The projection to be fitted with C3, have height 13 mm (having 2 mm flash with thread up to 10 mm from the top which have 1 mm flash inside the projection must be fitted O-ring smoothly) with  $\phi_{out}$  34 mm. The projection to be fitted with C1 have height 18 mm (having 3 mm flash and with thread up to 11 mm from the top which have 4 mm flash on the top of the projection) with  $\phi_{out}$  34 mm. C2 have a central hole of 32.00 mm throughout it. The central part of C2 will have an opening for gas outlet fitted with push fit (0.5 inch).
3. Hex flange C1 height 18 mm will be used to join Permeability tube with Hex-flange C2 by O-ring coupling. This hex flange contains a central hole of outer diameter 34 mm with threads up to 14 mm from top (to be fitted with C2) on one side. There will be another central hole of diameter 22 mm at the other side through which the quartz tube will pass.
4. Hex flange C3 height 26 mm will be used to join gas inlet pipe of outer diameter 6 mm and two bore thermocouple pipe of outer diameter 4 mm with Hex flange C2 by O-ring coupling. It will have a central hole of 34 mm containing thread up to 14 mm from the top (to be fitted with C2) on one side. The other side of the Hex flange C3 will be joined with a gas inlet tube and two bore thermocouple pipe (outer diameter 6 mm and 4 mm) by O-ring coupling.

### **Materials specification:**

1. Alumina Tube for permeability sample holder -Dimension:  $\phi_{out}$  22 $\times$  $\phi_{in}$  17 mm.
2. Quartz Tube for furnace -  $\phi_{out}$  35 $\times$  $\phi_{in}$  32 mm.
3. Quartz Tube for gas inlet -  $\phi_{out}$  6 $\times$   $\phi_{in}$  4 mm.
4. Two bore Alumina Tube for thermocouple sheath –  $\phi_{out}$  3.5 mm
5. Sufficient amount of Silicon Rubber O-ring is required for Quartz and Alumina Tube for each dimension as mention in drawing.
6. Thermocouple Wires-0.45 mm (K-Type)
7. Glass tube for sealing sample on alumina tube-  $\phi_{out}$  22 $\times$  $\phi_{in}$  17 mm).
8. Suitable arrangement for holding hex-flanges horizontally to furnace tube.
9. All the details dimensions are indicative and may change in actual design.

### **Others**

1. Vendor should provide name and contact from NIT/IIT/reputed Indian institute/Govt. research organization where the same type of job has been under taken in last three years along with copy of purchase order.