

**Neutron and X-ray Physics Section
Technical Physics Division
PURNIMA Laboratories**

Ref: TPD/NXPS/MF/153

Date: 07-05-2019

Due Date: 15-05-2019

Sub : Minor Fabrication - invitation of quotations.

1. Quotations are invited for the minor fabrication job, as per the enclosed specifications.
2. Bidder shall quote for fabrication of these components with material.
3. Taxes and excise duties shall be quoted separately.
4. The quotations must reach to the Head, Neutron and X-ray Physics Section, Technical Physics Division, Purnima Labs, BARC within 9 days of the date of this letter and must be sent by **Indian Speed post / Indian Post** only in a sealed envelope superscripted with the above reference number and due date given above
5. The address on the envelope should read:

Head

Neutron and X-ray Physics Section

Technical Physics Division

Bhabha Atomic Research Centre

PURNIMA Labs., Trombay, Mumbai 400085.

6. The bidder shall have to take an insurance policy against any material issued to him by the purchaser
7. The fabrication work shall be subject to inspection by our representative. The finished components shall not be dispatched prior to approval by our representative at the bidder's works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder's premises.
8. The bidder shall deliver the finished components and install it after approval by our representative, within **60** days from the date the firm purchase order issued to the bidder. The finished components and the scrap from the free issue material shall be delivered by the bidder at PURNIMA Laboratory, Neutron and X-ray Physics Section, Technical Physics Division (Near Plutonium Plant), Bhabha Atomic Research Centre, Trombay, Mumbai 400085.
9. Head, Neutron and X-ray Physics Section, Technical Physics Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.
10. The bidder should furnish the VAT, PAN and TIN numbers in their quotations without which the quotations will be rejected.
11. Quote for each part separately.
12. Detailed drawing will be made available after issue of order.
13. Clarifications for executing the order can be sought after issue of order.

Head,
NXPS/TPD

Description and specification of different items of

Work order ref: TPD/NXPS/MF/153

Fabrication and supply of temperature controlled Lead Melting Device- 1 No

Specifications:

This device is to be used to study the void/shrinkage pipe formation during solidification of lead. The machine assembly is shown in drawing no. 4

Machine consists of following parts:

1. Lead filled specimen: This is Stainless Steel enclosure filled with lead. Drawing is attached separately in drawing no.1. Welding should be checked through crack by ultrasonic radiography so that fumes or liquid lead does not come during the test. An air gap of 10mm at top is to be maintained during filling of lead so that expansion of lead does not results in high pressure in enclosure. Two specimens of different diameter are to be used for parametric study.

2. Infra-red heater: These ceramic infrared heaters are to be used for indirect heating of specimen for melting of filled lead. Specification is given below:

Parameter Value

Operating temperature Upto 720° C

Operating Voltage 230 V

Wattage 500 W

length 125mm

Width 62.5mm

Five heaters are required and five more heaters as a spare.

3. Reflectors: Reflectors reflects the IR radiation in the direction of the material to be heated. Hence the neutron radiography system gets less heat. They are able to hold and fix Infrared red heaters. Material is polished stainless steel. Dimensions should be in compliance with heater and width should not be more than 100mm. Five quantity is required during one tests.

4. Heater holder: After the complete melting of lead, the heater should be removed so that direct neutron beam can incident on lead filled specimen. Heater holder holds the heater and reflectors and can be easily handle for removing and placing the heaters around the specimen. It is made of Stainless steel. The dimensions are given in attached drawing no. 2.

5. Tray: It is used to keep the specimen and heater in it. In case of any leakage of lead, it retain liquid lead. It is made of Stainless Steel. The dimensions are given in attached drawing no. 3.

6. Thermocouple: Thermocouples are to be used to monitor the temperature of outer surface of specimen during melting and solidification. These results will be used to correlate the neutron radiography results with temperature. The specification is given below:

Parameter Value

Thermocouple type K type

Range 30-800° C

Operating Environment Upto 800° C

Accuracy · 2° C

length 2m

Thickness Less than 2mm

Cold junction No

In one specimen, 18 thermocouples are to be attached. Hence total 36 no.s of thermocouples needed.

7. Insulation Pad: This will restrict heat flow from the specimen . It should be in circular with diameter of approx. 120mm and thickness of around 25mm.

Note: All items should be quoted simultaneously. System should be installed and commissioned and should be supplied with operating manuals, connecting cables, power cords etc. Material will be accepted only after successful testing as per specifications at user site.

