

**Government of India
Bhabha Atomic Research Centre
Technical Physics Division
Mumbai-400 085**

Purnima Labs
Date: 26/10/2020

Due Date: 13/11/2021

Ref: TPD/XNTS/MF/SB/06

Sub: Fabrication and supply of borated polyethylene blocks with different boron content for radiation shielding at Purnima lab, BARC

Dear Sir,

1. Quotations are invited for fabrication and supply of borated polyethylene blocks with different boron content for radiation shielding at Purnima lab, BARC as per specifications attached herewith.
2. Bidder shall quote for fabrication and supply of these components with material. Taxes shall be quoted separately.
3. The quotation must reach, Head, Technical Physics Division on or before the due date and must be sent in a sealed envelope super scribed with the above reference number and due date given above through **register post/speed post of Indian Postal Services only**.
4. The address on the envelope should read:

The Head, Technical Physics Division
Bhabha Atomic Research Centre
Purnima Labs., Trombay, Mumbai 400085.
Attn: Dr.(Smt). Saroj Bishnoi

5. The bidder shall have to take an insurance policy against any material issued to him by the purchaser as free issue material.
6. 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.
7. The bidder shall deliver and install the finished components after approval by our representative, within stipulated delivery time from the date of 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, Technical Physics Division, B.A.R.C., Trombay, Mumbai 400085.
8. Head, Technical Physics Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.
9. Detailed drawing if required will be made available after issue of order.
10. Bidder must provide PAN, GST number in the quotation.

(Dr. (Smt.) Saroj Bishnoi)
Scientific Officer /E
Technical Physics Division
For and on behalf of President of India

General Specifications

1.0. Quality surveillance, inspection and inspection report:

1.1. All work covered by the specification shall be subject to quality surveillance by the purchaser or his authorized representative for which purpose the fabricator shall allow access at all reasonable times during manufacture to:

1.1.1 the premises in which the work is being carried out;

1.1.2 the drawings and/or tooling involved

1.1.3 gauges, inspection instruments etc. required for inspecting the work.

1.2. Inspection and tests shall be carried out by the fabricator as per the requirements detailed in the drawings and these specifications.

1.3. The fabricator shall submit three copies of inspection reports to the purchaser for approval if requires.

1.4. Components found unsatisfactory as to workmanship or material shall be removed by fabricator and replaced by components which are satisfactory.

1.5. Fabricator shall use materials as specified by the purchaser and submit to the purchaser, the material test certificate for approval.

1.6. The finished components shall not be dispatched prior to approval by our engineer at bidder's works.

2.0. Delivery

2.1 The bidder shall deliver the finished components after approval by our engineer within the delivery period mentioned in the firm purchase order issued to the bidder.

3.0 Sub contract

The fabricator shall not sub-contract any or all the work without written consent from the purchaser. The fabricator shall be responsible to the purchaser for all work of the subcontractor of the fabricator, if allowed by the purchaser.

4.0 Tax

4.1 Except GST no other taxes are payable.

4.2 Income tax @ 2% will be deducted from the bill.

5.0 Delivery: All materials should be delivered to **Purnima building, BARC, Trombay, Mumbai -400 085.**

Technical Specifications of borated polyethylene block:

Borated polyethylene blocks are required for radiation shielding application as per the following specifications and quantities.

Sr. No.	Item description	Quantity
1	20% borated polyethylene block Size: 750 mm x 650 mm x 50 mm	4 No.
2	20% borated polyethylene block Size: 700 mm x 700 mm x 50 mm	1 No.
3	20% borated polyethylene block Size: 500 mm x 500 mm x 50 mm	10 No.
4	15% borated polyethylene block Size: 300 mm x 300 mm x 50 mm	6 No.
5	10% borated polyethylene block Size: 300 mm x 300 mm x 50 mm	6 No.
6	5% borated polyethylene block Size: 300 mm x 300 mm x 50 mm	6 No.

Other specifications for all borated polyethylene

- i. Boron content in polyethylene blocks should be homogeneously distributed.
- ii. Boron isotope distribution: $\sim 80\% B^{11}$ and $\sim 20\% B^{10}$
- iii. Hydrogen atom density in block: $7 \times 10^{22} \pm 10\%$ atoms per CC
- iv. Dimensional accuracy of block: ± 2 mm
- v. Block density: 1.1 ± 0.05 gm/cm³
- vi. Test certificate for Boron content and Hydrogen atom density from Government of India recognized NABL labs should be provided.
- vii. A borated polyethylene sample of 10 mm dia. x 10 mm length size for each boron concentration should be provided for testing of Boron and Hydrogen content at BARC if required by indenter.
- viii. Note: splitting of quantity is not recommended. All items must be supplied as a single order.

Acceptance criteria:

1. Factory Acceptance Test (FAT) criteria:

- i. A sample from same lot of Borated polyethylene block should be taken for testing from NABL laboratory. Boron content and hydrogen atom density should match with the indent specifications.
- ii. Density of all blocks should be measured and it should be 1.1 ± 0.05 gm/cm³.

2. Site Acceptance Test (SAT) criteria:

- i. All factory acceptance tests of the borated polyethylene will be repeated at BARC by our representatives to validate the test reports and to ensure satisfactory performance.