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GOVERNMENT OF INDIA
BHABHA ATOMIC RESEARCH CENTRE
Nuclear Recycle Group

Ref.: NRG/TDD/AREA64/Filters/2017/75530

Dt: 05/05/2017.

Dear Sir,

Sub: Enquiry for minor fabrication work

We require the following work to be carried out on urgent basis:

S. No.	Description of work	Remarks
1.	Fabrication, inspection, testing and supply of HEPA filters with SS casing and flange as per scope drawing and technical specification. (Quantity: 25 Nos.)	The work shall be completed within 45 Days of issue of the work order.

If interested, please submit your most competitive offer for this work, in a sealed envelope duly writing our letter reference number, on or before **15.30 hrs on 19/05/2017**. The offers will be opened on the same day at 16.00 hrs. in the office of A.A.O, Accounts Works, NRG, BARC, Trombay.

1. Technical requirements of the works are mentioned in our technical specification.
2. No Free Issue Material (FIM) will be given by the department for this work i.e. complete material is required to be arranged by the contractor.
3. The work shall be completed within **45 Days** of issue of the work order.
4. Income tax @2% and S.C on the I.T, as applicable and educational cess on IT and SC, as admissible will be deducted from your bill.
5. The enquiries should be sent only by **speed post** and should be addressed to following address:

Yogendra Singh,
Scientific Officer-C
Room No. 313, CDCFT Building
TDD, Nuclear Recycle Group
Bhabha Atomic Research Centre, Trombay, Mumbai-400085
Ph no 022-25591121 /25591015
Email: singhy@barc.gov.in

The Enquiries sent by any other mode (e.g. manual, courier etc) shall be rejected without assigning any reasons as per terms and conditions of Accounts, BARC.

The offer shall be kept valid for a period of 45 days from the date of opening. All taxes, levies and transportation charges if any, shall be brought clearly in your offer. Please note that BARC is

exempted from paying excise duty and octroi duty. Accounts Officer, BARC, shall provide necessary certificate to this effect. Hence, your offer shall not include excise duty and octroi duty component and, if applicable, the same shall be indicated separately.

Full payment shall be made only after successful completion and acceptance of the work.

(Yogendra Singh)
SO/C, TDD, NRG
Phone: 022-25591121 (Direct)
022-25591015

Technical specifications for High Efficiency Particulate Air Filters

1.0 Scope:

The scope of this specification covers manufacture, testing at works, Packing and delivery to site of HIGH EFFICIENCY PARTICULATE AIR FILTER as specified below.

2.0 Specific rating & performance:

2.1 Capacity: 50 SCM/H

2.2 Overall dimensions:

Flange Face: 200mm x 200mm (+0mm, -1.5mm)
Filtration Area: 170mm x 170mm (+0mm, -1.5mm)
Depth: 150 mm (+0mm -1.5 mm) Excluding gasket.

Refer the drawing for more details.

2.3 Initial Pressure drop:

Not more than 25mm of WG at the rated capacity of 50 SCM/H.

2.4 Collection Efficiency:

Not less than 99.97% for particles down to 0.3 micron, when measured at rated airflow (50 SCM/H), By number count method employing size selecting particle counter and hetero disperse DOP test aerosol, having a size distribution in which at least 50% of the cumulative count is between 0.3 to 0.5 microns

OR

Not less than 99.97% for sub-micron aerosol when measured at rated airflow (50 SCM/H), by any international standard HEPA filter test method.

Any test method offered by the supplier shall have to be certified adequate by BARC before placement of order.

2.5 Core tightness:

The filter shall pass the core tightness test as per procedure described under 6.2(a) below. A back and forth force of 2Kg. imposed by neoprene faced wooden block (100 x 100mm) pressed against the center of the filter pack with a force of 2 Kg. Perpendicular to the face of the filter, shall cause no motion or shifting of separators or the filter pack more than 1.0 mm from the rest position in either direction.

3.0 Materials of construction:

3.1 Filter frame:

Filter frame shall have as per ASTM A240 Type 304L/ 316L minimum thickness 2 mm. The frame shall have 15 mm wide flange on one face as per ASTM A240 Type 304L/ 316L minimum thickness 3 mm. The supplier shall provide drawing of the filter frame indicating the design and dimensional features for approval before start of manufacturing.

3.2 Filter medium:

Water repellent 100% micro glass fiber (borosilicate) filter medium having the following characteristics.

a)	Basis weight	80-90 gms/sq.m
b)	Thickness	Not less than 0.4mm
c)	Airflow resistance at 2.5 cms/sec	Not more than 25mm WG
d)	Particulate removal efficiency	Not less than 99.97% for sub micron aerosol
e)	Water repellency	Zero penetration through the medium up to 762 mm of water head
f)	Tensile strength	Not less than 450gms/cm. Width in both machine and cross directions
g)	Combustible content	Not more than 8%
h)	Folding strength	Medium shall show no tears, breaks or cracks when a specimen is bent 180 degree around a 1.6 mm dia. Mendral.
i)	Uniformity	The medium should have uniform properties all over its length

3.3 Separator: Corrugated suitable material which can withstand in nitric acid fumes.

3.4 Sealant:

Sealant used for sealing the filter pack with the filter frame shall be nitric acid fumes resistance, oil resistance and shall be adequate to meet the temperature and humidity conditions specified, when set. The set sealant shall not show cracks or tendency to peel off from the filter frame.

3.5 Gasket:

Soft, impermeable, closed pore neoprene rubber gaskets with Shore ‘A’ hardness less than 5 and shall be of 6mm. thick and single piece or with dove tail joints at four corners on both sides of the flange. Width of the gasket shall be at wider side minimum 19 mm & shorter side 15 mm as shown in the scope drawing.

4 Filter assembly:

- 4.1 The filter shall not have splices and shall not spot patched to repair holes or cracks.
- 4.2 The edges of the separators shall extend at least 3mm beyond the pleats but not closer than 3mm to the filter frame. The pleats or the separators shall not be, as far as possible, kinked from the straight line drawn end to end of the pleat and shall be perpendicular to the frame.
- 4.3 The filter shall have adequate corner strength to avoid racking or skewing during handling, transportation and installation. The core of the assembly shall be tight.
- 4.4 The sealant shall be uniformly applied and the sealant shall be perfectly dry and set.
- 4.5 The gasket shall be firmly pasted on to the face of the filter with suitable adhesive and dove tail joints, if any, shall be without gap.
- 4.6 The corner gaps if any; between the filter face and gasket at joints of the filter frame members shall be fitted with the sealant with smooth finish.

5.0 Assembly tolerances:

- 5.1 Face dimensions: +0.0, -1.5mm
- 5.2 Depth: +0, -1.5mm
- 5.3 Square ness: Face diagonals of both feces shall be equal within 1.5mm.
- 5.4 Faces: The gasket-sealing surface shall square with the sides of the frame within +/-3 deg. and shall be flat and parallel within 1.5mm total allowance, when measured with one face of the filter on a surface plate.

6.0 Testing and inspection:

The following testing and inspection works shall be carried out at the manufacturer's site in the presence of the indenter or his representative.

6.1 Flow, pressure drop & collection efficiency:

Each filter shall be individually tested for the initial pressure drop and collection efficiency at the rated flow of 50 SCM^H, and 20% of rated flow, as per the approved test procedure, at the manufacturer's site. The test results (airflow, pressure drop and collection efficiency), the airflow direction and the date of testing shall be marked on the filter, after approval and acceptance. Only filters assembled and completed in all respects (without gaskets) with totally cured and dried sealant and of specified dimensions shall be taken up for this performance evaluation.

6.2 Qualification tests:

The following qualification tests shall be carried out at manufacture's work, on randomly selected filters out of the lot manufactured against the order and approved after evaluation for their performance as per sec. 6.1 above.

The core tightness test of the filter shall be tested as per the following procedure:

This test shall be conducted on 2 nos of the filters approved after performance tests.

The procedure followed for test shall have the prior approval of BARC. The procedure to be generally followed shall be:

Lay filter face down on a flat surface. Place 100x100mm block of wood, covered with neoprene pad glued to surface, at the center of the filter face. Place a 2Kg. Weight on the block. A force of 2 Kg. exerted on the block in a direction parallel to the face of the filter and perpendicular to the pleats in one direction. Observe the movement of the block in mm from the original position, exerting the parallel force in opposite perpendicular (to the pleats) direction. The filters shall qualify the requirements specified under 2.5 above.

In order to qualify the production lot, both the above filters should pass the test successfully.

7.0 Packing:

The individual filter shall be packed in a polyethylene bag and then into a rigid cardboard carton. The filter shall be placed in the carton in such a way that the faces and pleats are vertical when the carton is in the normal shipping orientation. The carton shall be marked as 'FRAGILE, HANDLE WITH CARE' & 'THIS SIDE UP' or similar legend. The serial no. of filter packed inside shall also be indicated.

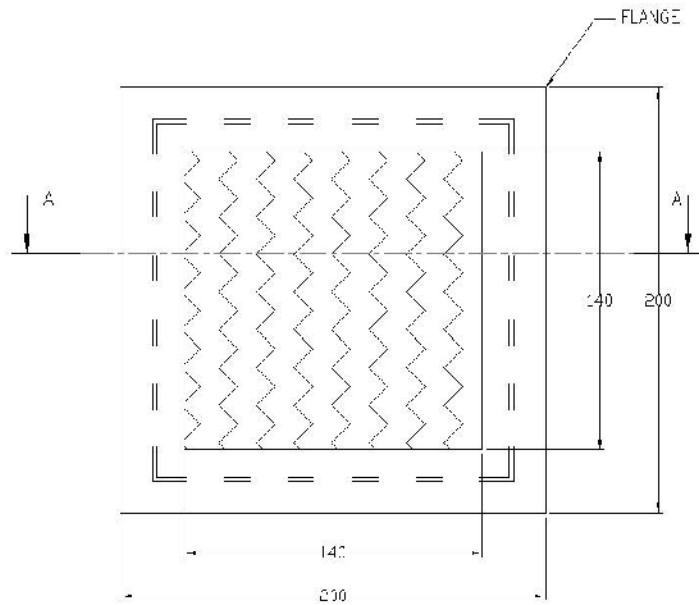
8.0 Delivery:

The supplier shall be committed to the delivery schedule indicated in the purchase order and shall be fully responsible for the delivery of the filters in our stores with no physical damage either to the carton or to the filter.

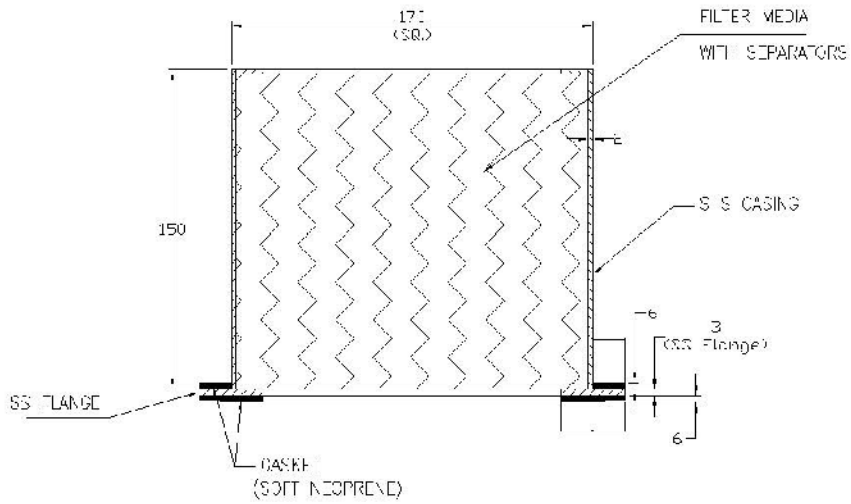
9.0 Enclosure to be provided with offer:

The following shall be positively enclosed with the offer, with out which the offer shall not be considered.

- a. Filter media details
- b. Product catalogue
- c. Casing material details



FRONT VIEW



SECTION A-A

GLOVE BOX SS HEPA FILTER