



**FUEL FIRING
PE (BOILERS)**

**TOS: 1422/ REV: 01
SHEET 1 of 6**

SPECIFICATION FOR MILL SEAL AIR FILTER

1. The specification Contains:
Part I - Standard Technical Requirement
Part II A - Vendor check list
Part II B - Special contract requirements.
2. If the requirement of part II B is differing with part I, the requirement of part II B will be mandatory.
Vendor should fill up the Part II after studying Part I and submit along with offer.
3. Vendor should fill up the Part II datasheet if any after placement of order and submit for approval.
4. Vendor offer will be rejected if part II is not filled up and submitted with offer or incomplete submission.

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REV No.	DETAILS	REVISED BY	APPROVED BY	DATE
01	Clause 3.1 & 3.2 added. Packing details changed. Efficiency Clause updated. Specification Revisited.	Dheeraj Kumar	G Sarvanakumar	04.03.2017



PART - I: SPECIFICATION FOR MILL SEAL AIR FILTER

1. Intent:

To design, manufacture, test and supply of mechanical (inertial) type air filter assembly as per the enclosed sketch (Sheet 6 of 6).

2. Technical specification:

Inertial type self-cleaning air filter consisting of filter element assembly stacked in a rectangular box. The number of filter assemblies depends on air flow quantity. This filter assembly consists of a number of shaped pressed metal vane blades stacked one over other and built like a panel, which can be inserted and bolted on to the filter box. The axial outlet of this pair of assembly is connected to bleed air duct which collects the dust and discharges out. The dust laden air after entering the filter bifurcates into two streams of clean air and dust carrying bleed air.

3. Design Parameters:

- Flow medium: Dust laden air at 1500 mm WC (Max.) @ 50 Deg. C. Density 1.06 kg/m^3
- Total Air Flow: Refer datasheet (Sheet 5 of 5)
- Permitted maximum Air flow/ Cell: $4020 \text{ Nm}^3/\text{HR}$ (2500 SCFM) (Vendor to state actual value)
- No. of cells: Vendor to Furnish.
- Test dust is classified into the following μm particle size ranges in % by weight ($\pm 3\%$).

PARTICLE SIZE, μm	COARSE DUST	FINE DUST
0-5	12%	39%
5-10	12%	18%
10-20	14%	16%
20-40	23%	18%
40-80	30%	9%
80-200	9%	-

f. Maximum pressure drop across filter shall be less than 150 mm WC.

g. Efficiency - 88% of all dust particles 5 micron size and larger
99% of all dust particles 20 micron size and larger

3.1 Dimensional details:

The following table provides the details of Bleed airline size, the flange size and the transition piece size on either side. Vendor shall ensure to match the sizes based on the Project Specific Bleed Line size received in Enquiry (Sheet 5 of 6).

Sl. No.	Bleed line size (OD X T) mm	Bleed airline flange size (mm)	Transition piece end size OD x T mm
1	323.9 X 4.8	NB300; CL150	914.0 X 5.0
2	406.4 X 4.8	NB400; CL150	1168.0 X 5.0

The bleed air flange shall be supplied along with counter flange, non-asbestos gaskets and necessary fasteners.



3.2 Transition Piece:

Transition piece matching with Pipe size as mentioned in above table shall be assembled to Seal air filter at inlet and outlet sides and supplied as single assembly. The transition piece shall be smooth and the length of each transition piece shall be of approx. 500 mm. The end of transition piece in Filter side shall be connected by flanges to the filter. Open end of transition piece shall have edge preparation suitable for welding with matching pipe.

Transition piece or other fittings like elbows at upstream and downstream of the seal air filter shall not affect the guaranteed performance/ efficiency of the filter.

4. Material:

Body: Carbon steel (Vendor to specify the material and grade)

Vane Blades: Corrosion resistant low alloy steel. (Vendor to specify the material and grade)

5. Testing and Inspection

- a) Purchaser's and End user's representative shall have access to the works of vendor at all reasonable times for the purpose of witnessing the purchased equipment being tested.
- b) Check all the dimensions.
- c) Verify main name plate & name tags.
- d) Type Test for the filter efficiency and pressure drop.
- e) All test certificates duly countersigned by BHEL/Authorized inspector shall be furnished.

6. Painting, Protection, Packing, Supply and Identification:

6.1 Surface Preparation

Weld slag & spatter shall be removed and the surfaces to be coated shall be free from contamination. Surface defects shall be removed by suitable methods. Sharp edges shall be smoothened by grinding. Prior to surface preparation oil, grease, drilling emulsions, cutting emulsions and preservative agents shall be carefully removed by suitable solvents. The surface shall be carefully dried with clean clothes to prevent the dissolved impurities from spreading over the entire surface. The surface shall be cleaned by wire brush and shot blasting if required. Proper adhesiveness of paint to the surface shall be ensured.

6.2 Painting

- a) Surface Preparation & Surface Profiles: SSPC-SP3/Power tool cleaning.
- b) Primer coat: No. of coats=2
Paint: Red oxide zinc phosphate Primer (Alkyd base) to IS 12744;
DFT=30µm per coat.
- c) Finish coat: No. of coats=1
Paint: Syn. Enamel paint (Long oil Alkyd) to IS2932; DFT=20µm per coat.
Shade: Smoke Grey Shade No. 692 of IS5.
- d) Total DFT = 80µm (minimum).

The painting shall be done such that it protects the equipment during transport, storage, erection and commissioning. Vendor shall indicate the direction of erection of Seal air filter with Bleed airline facing down. The instruction shall be painted with "This side UP ↑" in visible location on the body of the Seal air filter.



6.3 Packing

After completing painting and marking, Inlet and Outlet nozzles shall be properly capped to prevent ingress of water and dust and all the openings shall be firmly capped.

Assemblies shall be packed in wooden crate with sufficient struts and packing materials and with water proof under-cover.

7. Documents to be submitted

7.1 Along with Offer

- a) Point-wise Compliance (or deviation, if any) to this specification.
- b) Point wise compliance (or deviation, if any) to the Special contract requirements, if called for in datasheet (Sheet 5 of 6).
- c) Filled in data sheet (Sheet 5 of 6)
- d) Overall dimensional assembly drawing.
- e) Performance Curves.
- f) Copies of standard Test methods.

7.2 After Placement of Order/Along with the supply.

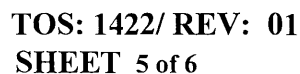
- a) Following works TC's shall be submitted along with the supplies.
 - Dimensional certificate for overall dimensions and terminal flange connections
 - Material test certificates
- b) Type test certificates for the filter efficiency & Pressure drop shall be provided.
- c) Six numbers of Operation and Maintenance manuals covering all aspects of storage, preservation, installation, operation and maintenance shall form part of the supply. The O&M manual shall contain the complete part list, make and material specification of all the items with necessary sectional views. Soft copies of O&M Manual shall be provided within one month after placement of order.

8. Guarantee Schedule

Trouble-free operation of the equipment shall be guaranteed for a period of 12 months from the date of commissioning OR 18 months from the date of dispatch whichever is earlier.

9. Recommended Spares

- a) Pre commissioning spares (if applicable) shall be supplied along with the equipment.
- b) Two years recommended Spares list (if required), shall be enclosed along with the offer.
- c) If any special or non-standard tools are required for installation, operation or maintenance, the same shall be supplied along with the equipment.

**ENQUIRY No.:**

II A		BHEL REQUIREMENT		VENDOR CONFIRMATION	
1.	Item:	Mill Seal Air Filter			
2.	Specification:				
2.1	Style:	Self-Cleaning Inertial Type			
2.2	Filter Assy.	U-Shaped metal sheet			
3.0	Design parameters				
3.1	Flow medium	Dust laden air @ 50 deg C			
3.2	Total Air flow	57600 m ³ /HR			
3.3	Maximum Air flow per cell	4020 Nm ³ /HR (2500 SCFM)			
3.4	No. of cells	Vendor to Specify			
3.5	Max. DP across filter	150 mm WC			
3.6	Bleed Airline size (OD X T) (in mm)	406.4 x 4.8			
3.6.1	Bleed airline flange size	NB400; CL150. (The bleed airline flange shall be provided with counter-flange, gasket and necessary fastener.)			
3.7	Transition piece end Diameter (OD X T) in mm	1168.0 X 5.0			
3.8	Efficiency:				
3.6.1	5 micron and larger	88%			
3.6.2	20 micron and larger	99%			
4.0	Materials				
4.1	Body	Carbon steel (Specify material and grade)			
4.2	Vane blades	Corrosion resistant low alloy steel(Specify material and grade)			
5.	Painting:	As per Clause 6.2 of Specification			
6.	Packing:	Water Proof in Wooden Box			
7.	Test certificates :				
7.1	Dimensional.				
7.2	Material compliance.				
7.3	Type test for filter efficiency.				
8.0	Documents to submit :				
8.1	Performance curves				
8.2	Assembly drg. with dimensions				
8.3	Copies of standard test methods.				
8.4	Minimum 6 copies O&M manuals:				
II B	SPECIAL CONTRACT REQUIREMENTS, IF ANY				
	(USE AN ANNEXURE IF THIS SPACE IS INADEQUATE)				
BHEL				VENDOR	
PREPARED BY		APPROVED BY		DATE	
NIKHIL SANKAR		SRINIVAS ARUGULA		17.09.2018	
PREPARED BY		APPROVED BY		DATE	

MILL SEAL AIR FILTER
(INERTIAL TYPE)

