

SECTION: 2.8

AIR FILTERS

1.0 **Scope**

1.1 The scope of work covers supply, installation and testing of following air filters.

1.1.1 Pre-filters before the cooling / heating coils of an air handling unit.

1.1.2 Fine or microvee filters on the supply air side either independent or as pre-filters to absolute or HEPA filters

1.1.3 Absolute or HEPA filters mounted in a filter plenum or in an air terminal unit.

2.0 **Standards: ASHRAE test standards 52 – 76.**

3.0 **Materials:**

3.1 **Construction**

3.1.1 Prefilters shall be cleanable panel type made of multiple layers of fine HDP mesh stitched or crimped together and arranged in such a fashion so as to give the desired filtration rating. The filter media may be separated by combs and fitted to an aluminum frame. Thickness of frame shall be 1.25 mm and the overall thickness of the filter panel shall be 50 mm. Filter panels shall be rendered fire retardant. Filter area shall be as specified.

3.1.2 Microvee Filters shall be cleanable panel type and media shall be random fibre mats (non woven) stitched with G1 mesh and suitably pleated. Pleats may be separated by combs and are to be rigidly attached to a aluminum frame. The thickness of the frame shall be 1.25 mm minimum. Filter panel thickness and size shall be as specified. Filters shall be rendered fire retardant.

3.1.3 HEPA filter media shall be water proof, high strength micro fibre glass paper. Corrugated aluminum separators should be provided to ensure uniform media utilisation. The casing shall be aluminum 1.6 mm thickness with leak free installation and dimensional stability. Neoprene (non particle shedding) gasket shall be fitted to the frame on both sides to ensure leak tight installation. The filter media shall be fitted to the filter frame with a suitable adhesive compound providing rigid construction without the need for mechanical fasteners.

3.2 Performance Criteria

3.2.1 Operating performance criteria for various kinds of filters shall be as under:

		Pre-filter	Microvee filter	Absolute filter (HEPA)
1	Filtration efficiency	90% down to 10 microns	99% down to 5 microns	99.97% down to 0.3 microns
2	Air velocity across The filter	1.25 to 1.5 m/s	1.2 to 1.3 m/s	1.2 to 1.3 m/s
3	Pressure drop clean	2 mm of WG	6 mm of WG	20 mm of WG
4	Pressure drop dirty	8 mm of WG	20 mm of WG	36 mm of WG
5	Reuse of filter after cleaning	Yes	Yes	No

4.0 Installation

4.1 The filters should be installed in the frames in such a manner that no air by pass takes place. Filters shall be easily inserted from the sides. Rigidity and sealing effectiveness of the frame are of utmost importance. HEPA filters should be handled and installed with extreme care. Filters should be installed such that the free area is at right angles to airflow to the extent possible and eddy currents should be avoided and air should be distributed uniformly over the entire filter surface. Sufficient space should be provided in front as well as behind the filter to make it accessible for service and access doors of convenient size should be provided to the filter service areas. All doors on the clean airside should be gasketed to prevent infiltration of unclean air and all connections and screws of the ducting shall be airtight. Filter bank must be caulked to prevent bypass in the case of HEPA filters. The filters shall be installed only after ensuring complete cleanliness of the system. After three months or as agreed each other, of continuous operation the contractor shall check the status of the filter and replace as necessary at their cost. The damage shall not exceed 25% of the number of filters.

5.0 Testing

5.1 All filters used shall have been tested for their efficiency and dust-holding capacity. Each type filter shall have a prototype test certificate and where ever necessary, the contractor should get the filters tested in an approved test facility.

5.2 After installation, all filters shall be tested for leakage in an approved manner.

6.0 **Mode of Measurement:**

6.1 Prefilters forming part of AHU's or Fan Sections shall form part of the AHU or Fan section.

6.2 Microvee Fine filters shall be paid for total bank including filter frame, filters, access panels, entry and exit plenum etc. as one unit.

6.3 HEPA filters shall be measured as specified in the schedule of work.