DESIGN GUIDELINE 230012
AIR FILTERS

Scope

This Design Guideline covers air filters for general HVAC use. It does not pertain to clean rooms or other spaces requiring High Efficiency Particulate Air Filters, or filters in laboratory equipment such as bio-safety cabinets. It does not cover specialty filter requirements that may be required for a specific project.

Related Sections

U-M Design Guideline Sections:
230013 - Air Handling Units

U-M Master Specification Sections:
234000 - HVAC Air Cleaning Devices

General

Filters shall be specified using U-M master specification 234000 - HVAC Air Cleaning Devices. Edit this specification section to make it project specific. Turn on hidden text and read all specification editor's notes when editing specifications.

Air filters shall be scheduled on the design drawings. Minimum schedule data shall include:

- Service
- Location
- Filter type (pocket/bag, pleated, etc.)
- MERV (Minimum Efficiency Reporting Value)
- Filter dimensions including depth
- Clean filter pressure drop
- Dirty filter pressure drop (1" w.g. typical)

For the typical air handler, specify filters and frames capable of a dirty filter pressure drop of 1" w.g. In all cases, size air handling (and exhaust) systems so that design air volumes can be delivered at the dirty filter pressure drop condition, not at some intermediate filter drop condition.

For filter efficiencies above MERV 8, pocket/bag or V-cell filters shall be specified. Due to problems with disposal, box style filters shall not be used except in unusual circumstances, when approved by the Design Manager.

Roll type filters shall not be used.

Washable filters shall not be used.

Filters shall be designated as face mounted with the filter seals sealing against the upstream side of the filter frame. Side slide filters shall only be used in unusual circumstances, when approved by the Design Manager.

For air handling equipment above 5000 CFM, always provide a prefilter and a secondary filter, located upstream of the first coil in the unit. This includes units equipped with final filters at or in their discharge.

Design filters so that the maximum air flow velocity across the filter does not exceed 500 FPM.In all cases, the AE's design must provide adequate access to allow changing filters. It shall not be necessary to remove fixed items, including ceiling grid, to change filters. Drawings shall indicate filter changing clearance requirements.

Filters and filter rack design should be based on the use of 24"x24" filters whenever possible. The use of 12"x24" filters to complete rack configurations is acceptable. If 24"x24" and 12"x24" modules are not possible, use industry standard filter sizes.

Filter Efficiency Guidelines

The below are guidelines only. Specific project requirements may mandate higher efficiency ratings.

Very small or non-critical air systems serving spaces less susceptible to dirt, e.g. mechanical rooms, may be designed with prefilters only.

Pre-filters shall be 2" deep, MERV 8, pleated panel type. Provide pre-filters in front of any secondary filter MERV 13 or greater application, where a pre-filter and secondary filter are warranted (such as built-up air handling unit applications).

Secondary filters for air handlers with a significant return air component and those for continuous 100% outside air handlers shall be MERV 13, pocket/bag or V-cell type.

Install additional filtration as warranted on an individual project basis. Critical environment applications such as clean rooms warrant HEPA filtration.

Vivarium animal room filters used to protect exhaust Laboratory Terminal Airflow Units shall be MERV 4 pleated panel type filters. These shall normally be mounted in the duct as opposed to on an exhaust grille face, and shall be equipped with a Magnahelic gauge.

Provide the manufacture's standard efficiency filters for packaged terminal air conditioners, fan coils, and similar small equipment. However, when this equipment exceeds 1000 CFM, specify 2" deep MERV 8 filters whenever possible.