

Air Filters for Data Centers: What Works

Air filtration is critical in data centers to protect sensitive equipment from particulate contamination. As server densities rise, many facilities move from MERV 11 to MERV 13–16 to better capture fine particles—while balancing efficiency with pressure drop and energy use through low-resistance, well-sealed filter designs.

At American Air Filter, we take a holistic approach—helping operators balance MERV, pressure drop, filter life, corrosion risk, and energy performance to support uptime, efficiency, and sustainability.

LEARN MORE



Criteria	Pleated Filters (Panel)	Bag Filters	Rigid Box Filters	Gas-Phase / Molecular Filters
Primary Function	Coarse to mid-level particulate removal	Fine particulate removal	Fine particulate removal	Removal of corrosive gases & molecular contaminants
Typical Efficiency Rating	MERV 7–13	MERV 11–15 (most common: 13–15)	MERV 13–16	Not MERV-rated (measured by gas removal efficiency & media capacity)
Typical Role in Data Center	Pre-filter (Stage 1)	Final filter in AHU/MAU	Final filter where rigidity/ space matters	Installed where outside air is introduced
Contaminants Removed	Large dust, debris	Fine dust, combustion particles	Fine dust, smaller particulates	SO ₂ , NO _x , O ₃ , H ₂ S, chlorine, VOCs
Protects Against	Protects final filters	Heat sink clogging, PCB dust buildup	Same as bag + structural durability	Copper/silver corrosion, ISA G2/G3 conditions
Dust/Gas Holding Capacity	Lower (dust)	High (dust)	Moderate (dust)	High (gas adsorption capacity varies by media)
Service Life	Short	Long	Moderate	Media-dependent; replaced based on breakthrough/corrosion monitoring
Initial Pressure Drop	Low	Low–Moderate	Moderate	Moderate–High (depends on media depth)
Pressure Rise Over Time	Faster loading	Gradual, predictable	Moderate increase	Stable until media exhaustion
Energy Impact (Lifecycle)	Good short-term	Strong balance of performance + energy	Higher if higher resistance	Higher fan energy but critical for risk mitigation
Space Requirements	Shallow depth	Deep housing required	Compact depth option available	Deep housing or dedicated cassette banks
Best Fit Application	Stage 1 protection	Central AHUs, hyperscale, colocation	High-velocity systems, tight mechanical rooms	Urban/industrial/coastal data centers