WHITE PAPER

HOW TO MAKE A MORE COST-EFFECTIVE OEM FILTER

PERMATRON®

COST-EFFECTIVE, INSIDE AND OUT

You may be surprised to learn that an air filter can play a significant role in the cost effectiveness of your OEM product. But custom designed air filters can boost performance, increase equipment life and lower your manufacturing costs. In fact, you'll find custom OEM filters playing an important role in thousands of products across dozens of industries.

AEROSPACE
COMPUTERS & ELECTRONICS
FOOD SERVICE & BEVERAGES
HOUSEHOLD APPLIANCES
HVACR
ICE MACHINES
INDUSTRIAL ENCLOSURES
INJECTION MOLDING
MANUFACTURING EQUIPMENT
MARINE EQUIPMENT
MEDICAL DEVICES & APPLIANCES
MILITARY
PHARMACEUTICAL EQUIPMENT
POWER/ENERGY EQUIPMENT
REFRIGERATED DISPLAY CASES & REACH-IN COOLERS
TELECOM EQUIPMENT
TRANSPORTATION
WIND TURBINES

At Permatron, we know a thing or two about OEM air filters. After all, we've been designing and manufacturing custom OEM air filters for more than 60 years. In this guide you'll find valuable information that will help ensure you have the most effective, and cost-effective, air filter for your OEM product.

A BETTER PARTNER

Not all air filters are equal, and neither are all filter manufacturers. A partner that has expertise and experience supplying quality filters for your industry is critical.

For example, filters can be created from a multitude of materials, and a reliable filter manufacturing partner will understand which is best for your specific application. Your OEM filter manufacturing partner should also be able to respond quickly to design changes, as well as seasonal or permanent increases or decreases in demand. On the other hand, an inexperienced partner can lead to higher and perhaps unnecessary filter costs, shorter operating life or product failure, and frustrating production delays.

SOME OF THE BENEFITS OF AN OPTIMAL OEM AIR FILTER SOLUTION

- Long-Term ROI
- Extended OEM Product Life
- Better OEM Product Performance
- Private Label Programs
- Large Volume Ordering
- Streamlined JIT Shipping
- Washable/Reusable Filters
- Fast Turnaround
- Keeping Up with Demand

THE COST BENEFITS OF *BETTER DESIGN*

When mass-producing OEM filters, relatively small differences can add up to big costs. For example, we are working with an OEM manufacturer that was using a ring panel filter with nonwoven media. They had been using the filter for more than 50 years. We quickly realized it was over-engineered, and a simpler design with different material would be just as effective while slashing the manufacturer's costs by 50-60%. Filter design elements to consider include material, frame, shape and size, all of which can enlarge or reduce costs, and enhance or mar product performance.

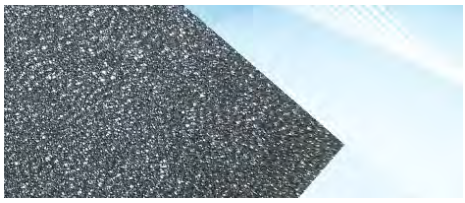
FILTER MATERIAL AND FRAMES

There are many materials and frame options you can choose from. Here are some of the most common.

POPULAR FILTER MATERIAL OPTIONS

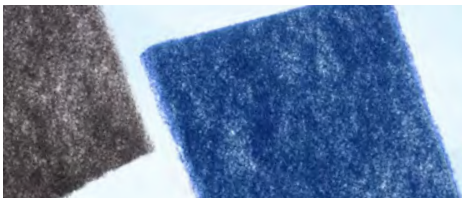
Polypropylene
Excellent strength, abrasion and mildew resistant, and stands up to extreme conditions, corrosive chemicals and more. Contains a permanent, inherent electrostatic charge to help collect particles, and can be easily washed clean.

- Available in two woven configurations: honeycomb and corrugated
- Natural white polypropylene is an FDA approved component used in food processing applications
- Black polypropylene media is UV protected for outdoor use and in conjunction with UV lights



Foam
Resilient and flexible, polyurethane foam air filter media is reusable and can be rinsed clean with water. Classified by pore size, the more pores per inch (PPI) the higher the "efficiency."

Activated Carbon
A dual action air filter media that helps control and remove odors, fumes, gases and particulates in recirculated air. Nonwoven polyester or foam can be impregnated and heat-set with a finely ground coating of activated carbon to increase the surface area available for adsorption.



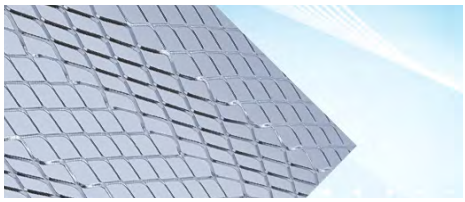
Polyester/Hogs Hair
A rigid polyester media, self-supporting and needs no frame. The fiber does not flake, shed or have sharp edges, is unaffected by moisture and cleans easily with water for long-term use. It works especially well as a mist eliminator. This air filter media is also available with an antimicrobial additive.

Nonwoven Polyester
A flexible high-loft synthetic media that captures a high volume of contaminants within the complete depth of fiber.

POPULAR FILTER MATERIAL OPTIONS (CONT.)

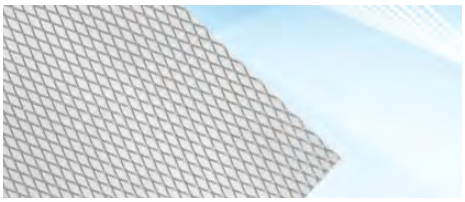
Plastic Netting
Commonly used as a protective barrier against environmental elements, nesting birds and hailstorms. Rigid in structure, netting is also layered as filter media support in air filters.

PVC Coated Polyester
UV protected, rot and corrosion resistant for outdoor use.



Corrugated Aluminum
A single layer of washable aluminum mesh that has been pleated into various heights.

Bonded Aluminum
3-dimensional media with multiple layers of aluminum slit mesh bonded together.



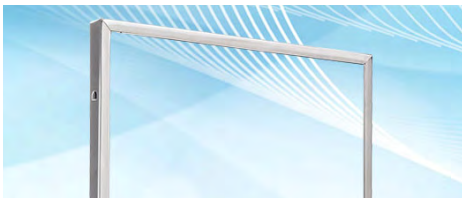
Flat Aluminum
A single layer of flat (not pleated) washable aluminum mesh.

POPULAR FRAME CHOICES

Galvanized Steel
Excellent rigidity and strength. Available in black when aesthetics are critical, such as for retail display cases.

Frameless
Depending on the size and material rigidity, some filters may not require a frame at all.

Vinyl
A flexible frame, ideal for piping or electrical components that require cut-outs or slits.



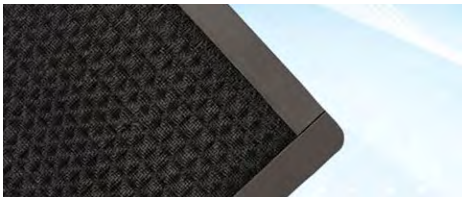
Stainless Steel
Ideal for harsh, corrosive marine environments, or for use in food service and medical applications that require sanitary design.

Sonic Welded
Ultrasonic bonding is a reliable filtration assembly solution for finishing the edges of flexible air filters. It's ideal for custom designs with tight tolerances and curved shapes.

Elastic
Finished with elastic edging for installation onto fan guards, round or square ventilation exhaust and air intake openings.

Aluminum
Corrosion resistant, lightweight and thin.

Plastic
Lightweight, corrosion resistant material with polymer strength properties.

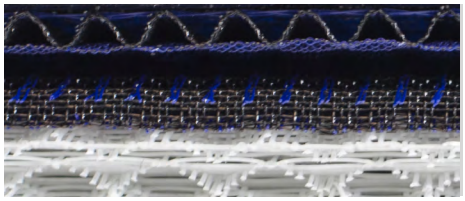


Magnetic
Adheres frame to the outside of steel air intake louvers. Allows for easy and quick cleaning access.

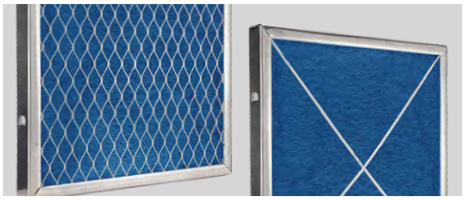
THE COST BENEFITS OF *FLEXIBILITY*

When discussing the design of your air filter with your OEM filter manufacturing partner, you'll want to carefully detail the challenges and environments your product will perform under. Here are some filter options your OEM filter partner may recommend.

Electrostatic Filters
Filters using a combination of charged airborne particulate attraction and impingement action to clean indoor air and provide extra protection. The electrostatic charge will not lessen over time.



Washable
Unlike disposable filters, these filters are meant to be washed and reused, providing long-term cost savings. They are also better for the environment.



Harsh Environments
Different filters are designed to perform in different environmental demands. Check with your OEM filter manufacturer on how well your filter performs under any of these extreme conditions.

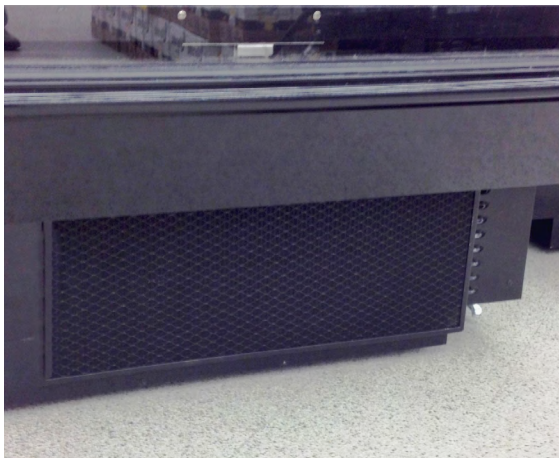
- Dust
- Moisture/Marine
- Food Processing/ FDA Audits
- Humidity
- Fumes/Gases
- Grease
- Heat
- Indoor/Outdoor

THE COST BENEFITS OF *PROTOTYPING*

Since an OEM air filter's effectiveness is dependent on many factors, you'll want to see how it performs under real-world conditions, as well as make sure it fits correctly and optimally. A prototype can save you a lot of time and cost later on.

When working with an OEM filter manufacturer, you'll also want to ensure they can turnaround your prototype quickly (at Permatron, we usually can ship our prototypes within two days). You don't want to wait for a prototype to hold up production of your product. Also, if your OEM filter manufacturer can't produce a prototype fast, will they be equally ponderous when you need a part product quickly, later?

THE COST BENEFITS OF *PERFORMANCE*



To ensure you have the most cost-effective OEM air filter, one that maximizes performance and long-term ROI, make sure it is designed to perform for your specific application.

These certifications or standards are among the most popular:

ASHRAE Standard 52.2
A method of testing general ventilation air cleaning devices for removal efficiency by particle size. Air filter manufacturers have their products independently tested to validate their performance claims, and the ASHRAE Test Standard is the most common of these. It produces a MERV (Minimum Efficiency Reporting Value) rating which reflects how a filter performs when loaded with dust. MERV ratings go up to 16, and the higher the number, the smaller the particle size it traps. While most people believe the higher the MERV rating, the better, that is not always true. While a higher MERV rating will protect your equipment from smaller particulates, it may also restrict air flow. A reliable filter manufacturer will be able to balance the need for contaminant removal while also allowing appropriate air flow.

Other factors to consider are a filter's Arrestance Efficiency percentage and its Dust Holding Capacity. The former measures a filter's ability to remove dust from the air, and the latter refers to how much dust a filter can accumulate and still be effective. Both of these measurements were part of the ASHRAE Standard 52.1, although they are no longer factored into the newer ASHRAE Standard 52.2. Instead, to determine a filter's performance in situ (that is, during the process of getting loaded up with dust) you would need to look at the Arrestance Efficiency percentage and the Dust Holding Capacity, plus loading curves, separately.

EN779:2012
An outdated European standard for determining the filtration performance of particulate air filters for general ventilation. Replaced in 2018 by ISO 16890.

ISO 16890
A four-part international standard that classifies air filters for general ventilation. It categorizes filter performance into Particulate Matter efficiencies (ePM).

UL 94 Certification
Underwriters Laboratories standard for flammability of plastic materials for parts used in devices and appliances.

FMVSS 302
This Federal Motor Vehicle Safety Standard measures the burning behavior of materials inside transportation vehicles. It was developed to help reduce death or injury from interior vehicle fires, such as from lit matches or cigarettes.

UL 900 Classified
Underwriters Laboratories standard for air filters that determines the amount of smoke generated and the combustibility of whole filters.

THE COST BENEFITS *OF PERFORMANCE* (CONT.)

IP Ratings
Ingress Protection ratings which define an enclosure's resistance to solid and liquid penetration.

NEMA Ratings
National Electrical Manufacturers Association (NEMA) standard similar to IP standard but includes additional protective requirements such as corrosion resistance and enclosure construction requirements.

NEBS GR-63-CORE
A Generic Requirements (GR) document regarding telecommunications equipment and components.

NEBS GR-487-CORE
For landlines and Public Switched Telephone Network (PSTN) equipment.

MIL-STD
A standard developed by the U.S. Military but often used as a baseline for testing in other non-military applications.

RoHS
A European directive that restricts the use of certain hazardous substances in electrical and electronic equipment.

REACH
A European Union regulation addressing the chemical composition of products and limiting the usage of Substances of Very High Concern (SVHCs).

California Proposition 65
The Safe Drinking Water and Toxic Enforcement Act of 1986. This applies to any products sold into or manufactured in the State of California. Labeling is required based on a list of chemicals known to cause cancer or reproductive toxicity.

Conflict Minerals
United States Securities and Exchange Commission ruling that requires disclosure of material resources originating from the Democratic Republic of the Congo or adjoining countries.

ATCA
Advanced Telecommunications Computing Architecture specification regarding the requirements of "carrier grade" communications equipment.

MicroTCA®
A modular, open standard for building high performance computer systems in a small form factor.

CompactPCI®
A family of specifications that define a modular approach to building computer systems.

THE COST BENEFITS OF *OEM PROGRAMS*

Aftermarket filter programs not only provide your customers with easy ways to replace parts, but can be a profitable part of any business plan. The best OEM air filter partners supply aftermarket filters to your customers as needed, with part numbers and packaging components clearly labeled. Filters can then be drop shipped directly to your customer, to your OEM aftermarket department, or, if you prefer, pre-made and stocked at your location.

Parts can also be packaged with your branding as part of an effective private label program.

THE COST BENEFITS OF *YOUR CUSTOM OEM FILTER*

A custom OEM filter should make your products perform better and last longer, while minimizing costs. An experienced partner, one with programs already in place, with an eye for quality and certification, and with a team ready to provide top support can make all the difference. At Permatron we've been OEM air filter leaders since 1957. We've designed and manufactured the best cost-effective OEM filter solutions for products in nearly every industry you can think of including electronics, foodservice, marine, medical and transportation.

We're considered a national leader in the manufacture and design of OEM filters for a good reason. Call us for your next OEM project, and see how cost-effective your next OEM air filter can be.

WHY PERMATRON?

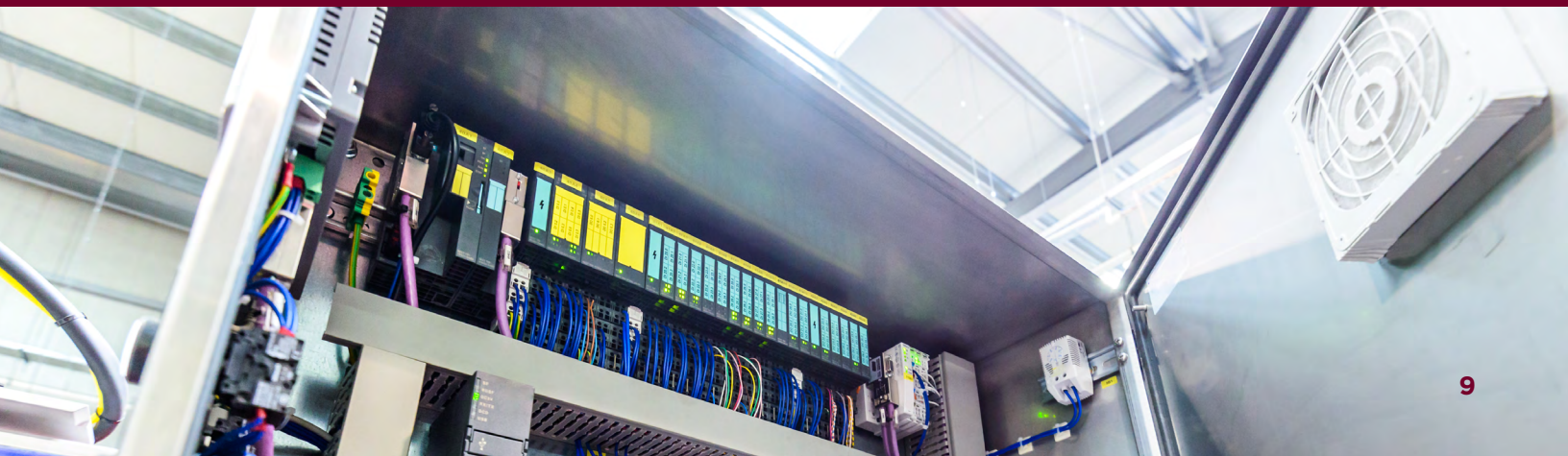
100%
on time delivery

DOZENS
of frame and media materials to choose from

60+ YEARS
of experience, and most of our OEM customer relationships are more than 20 years old

FREE
prototypes

UNLIMITED
selection and value



PERMATRON®

2020 Touhy Avenue, Elk Grove Village, IL 60007

1.800.882.8012 | sales@permatron.com
permatron.com/oem

RENSA FILTRATION | a part of the Rensa Filtration family of companies

Patent No. US 10,180,265 | Patent No. US 6,793,715