Advanced air and oil filtration technology from AMSOIL helps improve engine life and reduce maintenance costs.
AMSOIL Ea Air Filters represent a major breakthrough in filtration technology. The revolutionary nanofibers used in AMSOIL Ea Filters capture more dirt, hold more dirt and allow better air flow than conventional air filters. AMSOIL Ea Filters can improve engine performance and help engines last longer. When cleaned with a shop vacuum or compressed air once a year or every 25,000 miles, whichever comes first, Ea Air Filters provide a 4-year/100,000-mile service life.

What is Nanofiber Technology?

Nanofiber is a phrase that generally refers to a fiber with a diameter less than one micron. Cellulose fibers, on the other hand, are larger than nanofibers and have larger spaces between the fibers, causing contaminants to load in the depth of the media and plug the airflow path, resulting in higher restriction and less capacity. AMSOIL Ea Air Filters incorporate a specially constructed cellulose media with synthetic nanofibers applied to the surface. Dust and submicron particles are trapped on the nanofiber surface, preventing them from lodging in the filter media depth.

Here's how it works: imagine two filtration media, a chain link fence and a mosquito net. Each is required to stop contaminants, in this case tennis balls. A tennis ball fits tightly into an opening of a chain link fence, but obstructs the hole almost 100 percent. Now, imagine a tennis ball covering a mosquito net. The tennis ball, at the point of contact with the netting, obstructs much less filter area than it does in the chain link fence example. In fact, air will flow around the tennis ball all the way to the point of contact. It takes many more particles to obstruct the netting surface area than the chain link fence.

Similarly, the synthetic nanofibers in Ea Air Filters capture more wear-causing contaminants and prevent them from reaching the engine while maximizing air flow. The increased efficiency and capacity Ea Air Filters provide helps increase engine performance and extend engine and filter life.

The synthetic nanofiber technology behind AMSOIL Ea Air Filters prevent particles from loading in the depth of the media, resulting in improved efficiency, capacity and air flow.
Ea Air Filters Capture More Dirt

Efficiency is the ability of a filter to stop dirt and other airborne contaminants from entering the engine. The more efficient a filter is, the more dirt and contaminants it stops. The graph on the left demonstrates that AMSOIL Ea Air Filters are more efficient than cellulose and wet gauze air filters.

Studies on the ingestion of particulates show that increased dust passing the air filter results in additional engine wear (see graph at right). For example, a typical part such as a piston ring is exposed to low levels of radiation and then installed into a test engine. As the rings wear, the level of radioactivity decreases. This decrease can be directly correlated to wear. Filters such as Ea Air Filters that stop a greater amount of particulates lead to reduced engine wear.

Holds More Dirt

A filter’s ability to contain trapped contaminants determines how well an engine will run and how long the filter will remain effective. If the capacity is too low, the filter will require frequent replacement. When the filter is full, air cannot pass through at the rate necessary for proper engine performance.

AMSOIL Ea Air Filters hold up to 2.5 times more contaminants than cellulose air filters. The nanofibers in the media contain more pores per square inch, allowing for higher dirt-holding capacity and lower pressure drop when compared to cellulose filter media alone. Thinner media fibers produce more uniform pore size distribution, improving the filter’s overall quality and ability to capture and retain particles. Testing shows that Ea Air Filters hold 15 times more contaminants than a wet gauze-type filter. The capacity is so great, in fact, that AMSOIL Ea Air Filters remain effective for a full 25,000 miles or one year before cleaning. This coincides with AMSOIL Signature Series Synthetic Motor Oil’s 25,000-mile/one-year drain interval, adding convenience for motorists by consolidating routine maintenance.

Allows More Air Flow

Proper air flow is vital to maximizing performance and engine life. Air is required to release the energy from the fuel being used. It takes 1,200 cubic feet of air to combust one gallon of gasoline. Inadequate air flow can cause serious loss of power, poor performance and excessive fuel consumption. Tests show that AMSOIL Ea Air Filters have more than three times the air flow of filters that use cellulose media alone.
AMSOIL Ea Oil Filters feature advanced full-synthetic media, making them among the highest efficiency filters available for the auto/light truck market.

**Advanced Media Technology**

Cellulose and blended media found in most oil filters have larger fibers than the synthetic media found in Ea Oil Filters. They also have larger spaces between their fibers. This causes contaminants to load in the depth of the media and plug the flow of oil, resulting in higher restriction and reduced capacity. The smaller fibers in synthetic media also have a controlled size and shape. This results in greater efficiency and capacity than cellulose filters, as well as better durability. AMSOIL Ea Oil Filters provide a higher level of engine protection and extended filter change intervals.

**Absolute Efficiency**

Efficiency is the filter’s ability to capture contaminants. The more efficient a filter is, the more contaminants it will remove from the oil. To make a filter more efficient the spaces between the fibers in the media are made smaller, creating more resistance and limiting the oil’s ability to flow through the filter. Achieving maximum efficiency along with limited resistance is critical to good filtration.

The graph below shows that AMSOIL Ea Oil Filters achieve a near-perfect absolute efficiency rating. The exclusive technology used in AMSOIL Ea Oil Filters provides filtering efficiency to 98.7 percent at 20 microns. Ea Oil Filters are among the most efficient filters available for auto/light trucks.

**Maximum Capacity**

Capacity is the amount of contaminants a filter can hold and still remain effective. When a filter reaches maximum capacity the oil continues to flow through unfiltered, leaving harmful contaminants circulating in the oil. When a filter reaches maximum capacity it also reaches the end of its life and must be changed.

AMSOIL Ea Oil Filters have greater capacity than competing filter lines, providing convenience and cost savings through extended service intervals.

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**AMSOIL Ea Oil Filters**

- Help Reduce Engine Wear
- Trap Smaller Contaminants
- Hold More Contaminants
- Full-Synthetic Media
- Extended Service Intervals of 25,000 miles/One Year (EAO) or 15,000 miles/One Year (EA15K)
**Durable Construction**

AMSOIL Ea Oil Filters are made with premium-grade full-synthetic media. The strictly controlled processing of this media ensures accurate fiber construction and allows Ea Oil Filters to deliver increased durability. Over the service life of a cellulose filter, hot oil will degrade the resins that bind the media. Ea Oil Filters’ full-synthetic media technology uses a wire screen backing that is pleated with the media for superior strength. Ea Oil Filters are constructed with HNBR nitrile gaskets that are fully tested to extreme distances in numerous severe environments. The filters also feature fully tucked seams, a molded element seal, roll-formed threads and a long-lasting premium-grade silicone anti-drain valve.

**Improved Flow**

Proper oil flow is essential to keep moving parts lubricated at all times. A filter without adequate flow properties can cause catastrophic engine failure. Flow is restricted as the spacing in the filter media is made smaller to provide greater efficiency. The synthetic media in AMSOIL Ea Oil Filters allow maximum efficiency without restricting flow. This provides exceptional cold-start performance and ensures proper levels of lubrication throughout the engine.

**Extended Service Intervals**

When used in conjunction with AMSOIL synthetic motor oil, AMSOIL Ea Oil Filters are guaranteed for extended service life:

- Ea Filters designated with product code Ea15K are recommended for 15,000 miles/one year, whichever comes first, in normal or severe service.
- Ea Filters designated with product code EaO are recommended for 25,000 miles/one year, whichever comes first, in normal service or 15,000 miles/one year, whichever comes first, in severe service.
AMSOIL Ea By-Pass Filters provide the ultimate in protection against wear, oil degradation and corrosion in auto/light truck, heavy-duty and other applications.

**By-Pass Basics**
By-pass oil filtration systems feature a secondary filter with the purpose of eliminating nearly all contaminants in engine oil. By-pass filters have high capacities and eliminate much smaller particles than full-flow filters, including soot. They reduce engine wear and increase oil volume, but their high efficiencies mean they also have higher restriction and must be used in conjunction with a full-flow filter.

By-pass filters operate by filtering oil on a “partial-flow” basis. They draw approximately 10 percent of the oil pump’s capacity at any one time and trap the extremely small, wear-causing contaminants that full-flow filters can’t remove. By-pass filters have a high pressure differential, causing the oil to flow through them very slowly and allowing for the removal of smaller contaminants. It is called by-pass filtration because the oil flows from the by-pass filter back to the sump and bypasses the engine. This continual process reduces long-term wear and helps extend drain intervals.

**Higher Efficiency**
AMSOIL Ea By-Pass Filters provide higher filtering efficiency, soot removal and increased oil capacity due to superior media composition and configuration. They feature an efficiency of 98.7 percent at two microns. At normal operating rpm, the Ea By-Pass Filter will filter all of the oil in a typical five-quart sump in less than 10 minutes.

**Superior Construction**
The superior construction of Ea By-Pass Filters provides better sealing and increased longevity along with superior corrosion resistance. They feature a marine powder-coated exterior. Their zinc-dichromate base plates increase rust protection, and are compatible with existing AMSOIL by-pass filter mounts. Ea By-Pass Filters have a nitrile HNBR gasket and an orange silicone anti-drain valve.

**Longer Lasting**
When used in conjunction with AMSOIL motor oil and an AMSOIL Ea or Donaldson® Endurance™ Full-Flow Oil Filter, Ea By-Pass Filters should be changed every other full-flow filter change up to 60,000 miles. When used with other brands of motor oil or full-flow filters, Ea By-Pass Filters should be changed every other full-flow filter change. AMSOIL recommends using oil analysis when extending oil drain intervals.
Soot Removal
AMSOIL Ea By-Pass Filters remove 39 percent of soot contaminants less than one micron. Soot removal efficiency can increase approximately 10 to 14 percent when Ea By-Pass Filters are used in conjunction with a standard full-flow filter, even higher in conjunction with Ea Filters or Donaldson Endurance filters.

The Dangers of Soot
The combustion process in diesel engines creates soot. After fuel is injected, combustion occurs, producing soot as a by-product. The combustion particulates then become trapped on the exposed oil film. The rings wipe the particulates into the oil and the fine particulates aggregate, increasing levels of soot in the oil. Oil with dispersant additives will generally keep soot in the range of 0.002 to 0.5 microns in suspension. As the amount of soot suspended in the oil increases, the performance of these additives decreases.

Soot Causes Wear
As dispersants in the oil are consumed, soot particles grow to a size that causes problems. This creates a direct correlation between wear and soot concentration; the higher the concentration of soot, the higher the level of wear (see graph).

Today’s oil manufacturers are extending oil life by holding higher concentrations of contaminants, including soot, in suspension in the oil. They are also increasing fuel economy by reducing oil viscosity and oil film thickness, therefore reducing the critical contaminant size. This further necessitates the use of by-pass filtration, especially in diesel engines.

EaBP Vital Statistics
AMSOIL offers several by-pass filtration systems and Ea By-Pass Oil Filters that can be installed on a variety of popular applications, including Ford Power Stroke®, Chevrolet Duramax®, Dodge Cummins®, heavy-duty trucking, marine and other applications. Contact your local AMSOIL Dealer for information. By-pass filtration is a valuable commodity for anyone who wants to extend drain intervals and prolong engine life. It is also beneficial to vehicles that are exposed to high levels of contaminants on a regular basis.

As soot levels increase, the wear scar diameter increases, showing the direct relationship between soot and wear. “Study on Wear Mechanism by Soot Contamination in Engine Oil” – Sato, H., Yamamoto, H. and Sasaki, M.
AMSOIL Ea Heavy-Duty Extended-Life Oil Filters provide excellent filtering efficiency and high contaminant-holding capacity for heavy-duty applications including, but not limited to, over-the-road trucks; dump trucks; refuse haulers; school buses; farm tractors; mining, construction and industrial equipment; and more. They provide extended-service intervals that coincide with the maximum drain interval recommendations of AMSOIL synthetic motor oils (not to exceed one year), increasing convenience and reducing maintenance costs.

### Absolute Efficiency
AMSOIL Ea Heavy-Duty Extended-Life Oil Filters are engineered using full-synthetic media that provides an average filtering efficiency of 98.7 percent at 20 microns in accordance with industry standard ISO 4548-12, ranking them among the most efficient available for heavy-duty applications. Increased efficiency helps reduce wear for long engine life.

### Less Restriction
Ea Heavy-Duty Oil Filters have lower restriction than conventional cellulose media filters. Their small synthetic fibers trap smaller particles and hold more contaminants, resulting in lower restriction. During cold-temperature warm-up periods, an Ea Heavy-Duty Oil Filter allows the oil to flow through the filter more easily than a typical cellulose filter. Lower restriction helps circulate oil more quickly, promoting long engine life.

### Contaminant Capacity
A filter’s capacity refers to the amount of contaminants it can hold and still remain operational. AMSOIL Ea Heavy-Duty Oil Filters have a high holding capacity for small, wear-causing contaminants.

### Superior Construction
Ea Heavy-Duty Oil Filters are made with premium-grade full-synthetic media. Over the service life of a conventional cellulose filter, hot oil can degrade the resins that bind the media. Ea Heavy-Duty Oil Filters’ full-synthetic media technology is resin-free. It uses a wire screen backing that is pleated with the media for superior strength. Ea Heavy-Duty Oil Filters are constructed with HNBR gaskets that are fully tested over long durations in numerous severe environments. The filters also feature fully tucked seams, a molded element seal, roll-formed threads and a long-lasting, premium-grade silicone anti-drain valve.