



ENGINE OIL FILTERS

What Makes A Good Filter?

Engine oil filters have one purpose in life; they filter out the particles that enter the oil so they don't act as abrasives when the oil is circulated back through the engine. The filter media is a cellulose media or a synthetic media that is usually contained in a steel can. The front of the can typically has a threaded center with surrounding holes. These surrounding holes may vary in size and number. Oil enters through the surrounding holes, passes through the filter media, and exits through the threaded center. Many filters have an anti-drain back valve to prevent oil from draining out of the filter when the engine is turned off. This allows the engine to have instant circulation when started. They also have a pressure by-pass valve that will allow oil to by-pass the filter element in the event that it becomes too plugged to filter enough oil or when the oil is cold and thick. This prevents engine oil starvation or collapsing of the filter media. A good filter has a strong steel can to withstand the high oil pressure, an anti-drain back valve that doesn't leak, a bypass valve set to manufacturer specifications, a strong element, and metal caps that can withstand the pressure and flow of oil without falling apart.

Filter Media Material. Most companies use either plain cellulose or cellulose reinforced paper with synthetic fibers. The media is designed to trap particles of a certain size or larger. The size of the particles it is designed to trap are measured by microns. If the filter traps very small particles, it is possible that it will plug up very quickly and go into bypass mode before it is changed. This will cause dirty, unfiltered oil to circulate back into the engine components.

Surface Area of the Filter Media. The more surface area available to capture particles, the less likely you are to have the by-pass valve open up and send contamination into the engine before a filter change is due.

Thickness of Filter Media. A thicker media is likely to be more efficient at removing and containing contaminants. However, a thicker media is also likely to provide more resistance and reduce the flow through a given area of media. Very thin media might be easily damaged.

Cartridge End Cap. Most filters use metal end caps that have the filter media embedded into them and filled with sealant. Most filters also include a center tube made of perforated metal to keep the filter media from collapsing and also should be embedded into the end caps with sealant. Sometimes cardboard may be used as end caps.

Filter Cartridge Container. Filters include either a leaf spring or coil spring between the filter element and the top of the can. This is used to hold the filter cartridge tightly to the base.

Anti-drain Back Valve. If the anti-drain back valve does not function properly, oil will drain out of the filter when the engine is turned off.

Bypass Valve. The bypass valve may be located at the base of the filter or at the top end of the filter. It is important to have a bypass valve that opens at the correct pressure specified by the manufacturer. A bypass valve that opens too early can cause contaminated oil to enter the engine. A bypass valve that is set too high can starve the engine for oil if the media becomes plugged.

Filter Housing. The filter housing should be strong enough to prevent the can from expanding or collapsing.

Filter Base. The base should be strong and have the proper threads.

Filter Base Gasket. The gasket needs to be of the proper size. Most gaskets are made with Nitrile rubber.

Micron Rating. A micron rating for a fluid filter is a generalized way of indicating the ability of the filters media to remove contaminants by the size of particles it is exposed to. The work micron is another term for micrometer (1 millionth of a meter). Typical micron ratings are;

Table salt – 100 microns
Diameter of the average human hair – 70 microns
Lower limit of visibility (naked eye) – 40 microns
Blood cells – 25 microns
Talcum powder – 10 microns
Red blood cells – 8 microns
Bacteria – 2 microns