



Filter Knowledge, Unfiltered

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Introduction to Cabin Air Filters Their Purpose, Design and Function

Modern Cabin Air Filters (CAF) have been installed in European vehicles since the mid 1980's. Today several North American manufacturers offer the CAF as standard or optional equipment on various models. It is currently estimated that over 70 percent of the vehicles on the road have a cabin air filter, and the number is continually growing. The typical CAF is located in the fresh air intake system. The CAF is also known as a passenger compartment filter, pollen filter or dust filter.

When the vehicle is in motion, or when the ventilation system is in use, all impurities that are present in the outside air are sucked into the cabin like a vacuum. At this point, there can be a dangerous concentration of pollutants and toxic gases. This creates a need for the filtration of the outside air which is particularly important for the passengers in the vehicle. Unclean air can lead to allergic reactions and represent an acute danger when traveling. Nitric oxide NO₂ can, for example, cause an asthma attack. With over 40 million allergy-sensitive people in America the demand for high quality CAF will definitely increase.

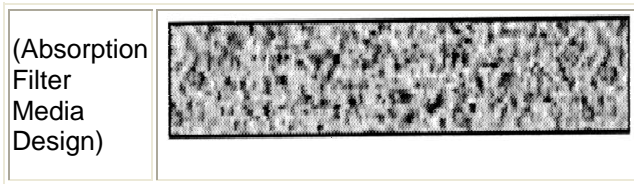
Initially the CAF was designed to remove solid contaminants such as dust and soot. Test methods are outlined under ISO, DIN and SAE documentation. Typically CAFs capture more than 95 percent of all particles 3 micron and greater. In addition, a high percentage of contaminants below 3 micron should be removed at an acceptable pressure drop. Particulate in this range would include: pollen, exhaust soot, bacteria, insecticides and mold spore, the common cause of that stale musty smell emitted from the vehicle air vents. It is note worthy that the majority of particulate matter below 1 micron in size is manmade: exhaust gas particulate, industrial dust, carbon black, cigarette smoke, etc.

Design and Function of Cabin Air Filters:

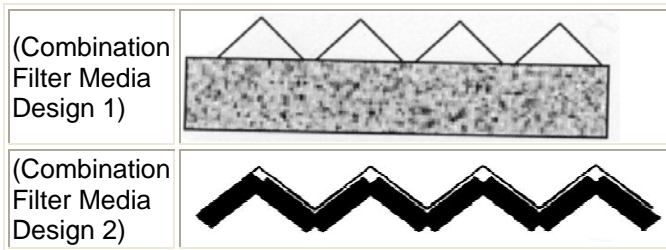


The Particle Filter filters out the solid particles such as dust, soot, spores and pollen. Filtration media is a special type of paper or non-woven material (micro-

fiber fleece). Additionally, the filter media could be charged electrostatically. The combination of electrostatic and mechanical filtering results in high filter efficiency.



The Absorption Filter filters out noxious gases and odors. Filtration media is activated charcoal which is highly porous and has a large surface area. The gases are soaked up in a sponge-like manner through gaps 10,000 times smaller than a human hair.



The Combination Filter or Two Stage Filter, combines the advantages of both filter types in one filter. During the first stage of particle filtration the small particles such as dust, pollen, soot and spores are filtered out. The air cleansing results from the sieve-effect and electrostatic attraction of the filter medium. During the second stage the toxic gases and odors are filtered out. In some applications, Two Stage Filtration is accomplished using the combination of a particle filter and adsorption filter in series in the fresh air intake system.

Change interval:

A CAF should be changed on a regular basis according to the vehicle manufacturers' recommendations. If a cabin filter is NOT changed regularly the efficiency of the fresh air intake system will be diminished. For example, defogging windshields may be difficult.

For additional information, contact:

Filter Manufacturers Council
P.O. Box 13966
Research Triangle Park, NC 27709-3966
Phone: 919/549-4800 Fax: 919/406-1306
www.filtercouncil.org
Administered by Motor & Equipment Manufacturers Association