



Gasoline filtration

Effective protection for modern injection systems

Gasoline filters guarantee adequate fuel quality and thus protect modern injection systems against wear. The requirements on gasoline filtration have risen with the development of direct injection systems and the increasing use of maintenance-free, lifetime fuel filters.

The filter elements from MANN+HUMMEL fulfill all the requirements of modern injection systems.

Gasoline, like every other service fluid, is subject to a certain contamination through organic and inorganic particles. Modern direct injection systems react very sensitively to even the smallest of impurities in fuel and thus place very high demands on gasoline filtration.

Fuel composition and the aimed for service life are important influencing factors when it comes to developing gasoline filters. There are national differences in fuel composition. For example, gasoline with admixtures of ethanol and methanol can be found on the market in the NAFTA region. The trend in service life is moving towards increasingly longer intervals between changes so that more and more lifetime filters (> 240,000 km) are being used. The chemical resistance of the filter media and materials used have to be adapted to the altered conditions of lifetime use and the various fuels.

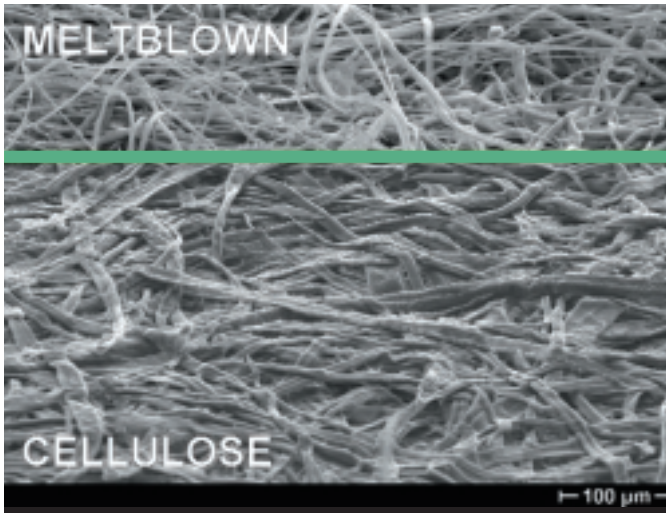
Whereas carburetor engines used mainly utilize inline filters with standard filter media, multi-layer filter media are increasingly being used today. MANN+HUMMEL develops high-quality filter media (MULTIGRADE F_GAS), that are optimally adapted to meet the filtration requirements and provide the necessary chemical resistance. MANN+HUMMEL gasoline filters thus provide optimum protection for fuel injection systems – especially direct injection systems.

High-performance filter media

Filter media

The demand for an extremely fine filter media with simultaneously high dirt-holding capacity, calls for innovative filter media concepts. Apart from standard filter media, MANN+HUMMEL also uses filter media with integrated gradient structures and multilayer filter media – so-called MULTIGRADE F_GAS media – in gasoline filtration.

Compared with earlier cellulose-filter papers, MULTIGRADE F_GAS media have a much improved filter performance and better resistance to chemically aggressive fuels. A wide range of MULTIGRADE F_GAS media are available in various filter fineness levels.



REM image of MULTIGRADE F_GAS filter medium

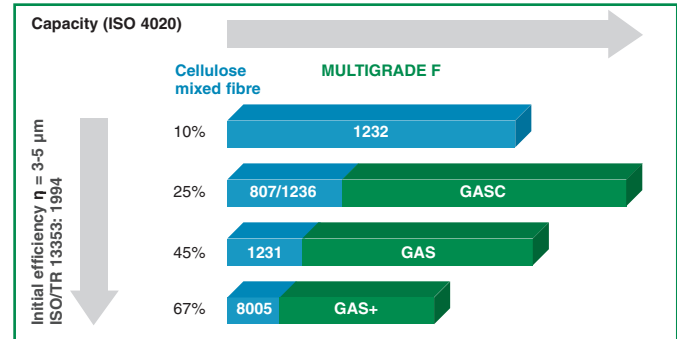
Media structure

MULTIGRADE F filter media are multilayer filter media. The high performance in separation efficiency and storage capacity is achieved through the selective optimization of the composition and structure of the filter media. The "dirty" fuel initially passes through a meltblown pre-filter of superfine,

Advantages

- High filter fineness, high dirt-holding capacity
- Excellent chemical resistance
- Lifetime filtration, i.e. no more changing the filter when MULTIGRADE F_GAS filter media are used
- Optimum protection for the injection system
- Reduction of hydrocarbon emissions through in-tank installation

meltblown plastic fibers with an extremely high dirt-holding capacity. A second, very dense cellulose-based superfine filter layer traps the microparticles. This greatly improves the dirt-holding capacity over standard filters.



Dust holding capacity of various filter media in comparison

Use and designs

Since lifetime filters do not have to be changed, they are normally situated in the fuel tank. This does away with any connections between the fuel line and fuel filter, thus no longer contributing to emissions.

The statutory limit for hydrocarbon emissions is currently 2 g (EU Guideline, Test 3-Day-Diurnal). Stricter limits of around 0.5 g and below (0 g) are planned for the future. The integration of the fuel filter in the fuel tank plays a very important role in reducing hydrocarbon emissions.

Gasoline filters are always installed on the pressure side. Both lifetime and inline filters are available in the market. Pressure sensors are sometimes integrated into the fuel filter to regulate the system pressure to a constant differential pressure to the ambient pressure.



Lifetime filter elements

