FILTERED FOR LONGEVITY & RELIABILITY

The reliability, fuel economy and longevity in mobility have increased due to the advancement of filters. Filters are also instrumental in increasing the intrinsic safety of an automobile. On an average, replacing a fuel filter at regular intervals increases the fuel economy between 12 and 15 %, while acceleration of a vehicle improves by about 9 % on replacing a clogged air filter.

Filters enhance the emission control system and minimise spark plug ignition problems that lead to drivability issues. Appropriate air flow facilitates the engine to function accurately, thus reducing emissions as well as fuel consumption. The reliability of a vehicle is enhanced multi-fold, when monitoring and replacing other oil filters in systems.

GROWTH PROJECTIONS

Projections show that the filters market will grow between 5-8 % CAGR until 2025. The aftermarket end user market growth is projected to be more than the OEM market. This growth rate for fuel filters is projected to be higher than the air and cabin filters. The major growth drivers include growth in number of vehicles, focus on reliability through regular preventive maintenance, increased longevity,

and connectivity through increased driving per vehicle. Strong technological development and a changing innovation landscape for filtration media is also responsible for an expected growth across the industry.

As a background, oil filters are integrated to remove contaminants from transmission oil, engine oil, lubricating oil or hydraulic oil. Transmissions – both automatic and manual – and power steering systems have integrated filters too. Filters can be categorised into mechanical, cartridge and spin-on, magnetic, sedimentation, centrifugal, and high efficiency.

INNOVATIONS

Innovations in materials and sub-system designs have resulted in reducing the size of filters, ability to perform at higher temperatures, and enhanced performance per square inch. Filters are being developed using organic materials, polyurethane-based adhesive materials, and made to order for specific application domains. The filtration media is mainly of paper and fabric. In addition, fabrics are of the non-woven and knit types, and few are activated carbon. Some researchers have developed stainless steel mesh that is coated with carbon nano-tubes about 10

microns across and have a super-honeycomb structure that repels water.

The process of filtration has also gone through evolution depending on the application in the vehicle. Processes such as ion exchange, membrane separation, distillation, photo-oxidation, ozone treatment are popular.

Regulations and stricter emission norms have increased the filter manufacturers' focus on innovating techniques and materials to keep pace with the societal demands of a cleaner and greener environment. Increasing health concerns among the global population coupled with growing pollution rates will continue to influence innovation in filter media and techniques. Growing awareness levels regarding the importance of oil and fuel filtration for better longevity are among other drivers.

RECYCLABILITY

Used oil filters can be processed to recycle both the used oil and steel remains. The drained oil can be refined in to lower grades of lubricating oils or fuel and the steel scrap can be reprocessed into new steel products such as cans, appliances and construction materials. Estimates show that efficient recycling of used oil filters sold annually in the United States alone could result in the recovery of about 160,000 tonne of steel.

Filters have evolved as life savers in the major sub-systems of a vehicle and are even more importantly integrated in sub-system designs for better longevity, reliability and fuel economy in a vehicle. They are important blocks in the ecoland of reduction of greenhouse gases and sustain a cleaner environment.

DR ARUN JAURA
European Advisory Committee,
SAE International, USA

Read this article on
www.autotechreview.com