

# ZOOM

FOCUS ON TECHNOLOGY



PRODUCT COMPARISON

**Heavy Fuel Filter.**  
Maximum protection  
for your engine.



in collaboration with  **DEKRA**

**Genuine Parts**  
HIGH PERFORMANCE

# How they are made.

## The fuel filter.

The Fuel Filter is a key element for the functioning of the engine and its components. Its qualities and technical features have a great impact on vehicle performance, durability and consumption.

Its main role is to clean the fuel from dust, metal particles and other contaminants that may be detrimental for the injection parts.

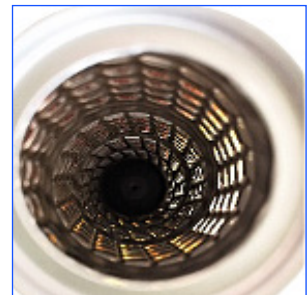
Genuine IVECO Fuel Filters are designed to protect and enhance the performance of your injection system. Specially adapted to your IVECO engine, the filters remove the particle of 4 key types of contaminants (water, organic, soot and mineral) to ensure that your fuel keeps circulating and stays clean for longer.

Working along with the fuel filter is the Fuel Pre-Filter, placed between the fuel tank and filter. The pre-filter removes any larger particles before they hit the fuel filter thus removing a load off the main filtration system. It also separates the water from the diesel prior to getting to the primary filter.

## Holed support.

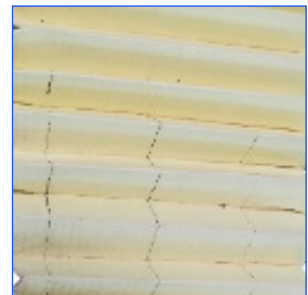
It's right in the center of the filter and enables, through its holed surface, to convey the clean fuel towards the injection system. The more openings are present, the better and more efficient the fuel distribution on the filtering element will be.

On the contrary, the fuel will be carried towards a smaller filtering surface causing a quicker filter obstruction.



## Filtering material.

It's the core. Its specific design and the embossing guarantee a better filtration. A higher number of creases rises the filtering capacity towards the smallest particles in the fuel and the embossing allows to keep the correct distance between the creases. In this way, the whole filtering surface will work for a better cleaning action.



## Stable thread cover.

Allocated on the filter, it has a double function. It allows the entry (through the external holes) and exit (from the central hole) of the fuel from the filter itself and has a fixing role, thus avoiding leaks or detachments. If the cover is too light or does not have a sufficient number of threads, the fixing is not optimal thus increasing the risk of detachment of the filter from the fuel filter support (i.e., in case of high vibrations).



# How they are tested.

**The original IVECO Genuine Fuel PreFilter was the main testing character.** It was tested together with three prefilters from competitors by the independent German testing institute DEKRA.

The objective was to compare the filters and their characteristics by simulating situations that occur during their life cycle. The tests determined the filters' ability to retain contaminants, their efficiency, and the generated differential pressure.

DEKRA carried out tests on filtration efficiency by particle count and contaminant retention capacity according to ISO 19438:2003. Moreover, the Multi-pass test was implemented according to ISO 19438, ISO 4548-12 and ISO 16889. The aim of this test was to examine filters performance, their contaminants removal efficiency and pressure/flow difference characterization. Finally, DEKRA carried out the water/fuel separation test to evaluate filters ability to separate undissolved water from fuel (ISO 16332:2018).

Last, a teardown was also performed to analyze both technical (materials, assembly quality) and functional aspects (number of components, adopted technical solutions).



## About Dekra.

DEKRA has been active in the field of safety for more than 90 years. Founded in 1925 in Berlin as Deutscher Kraftfahrzeug-Überwachungs-Verein e.V. (German Motor Vehicle Inspection Association), today it is one of the world's leading expert organizations.



## The results.

The tests show how IVECO Genuine filter obtained the best results in all the key areas:

### Performance

Filtering performance and efficiency

### Durability

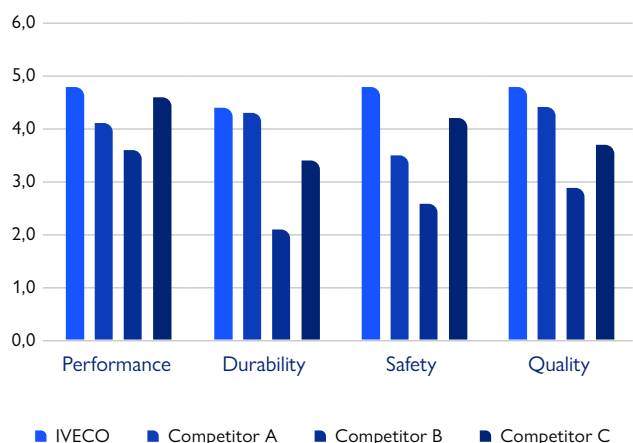
Permeability and longer protection for the injection system

### Safety

More resistant materials in all conditions

### Quality

Higher construction and assembly materials



# Performance.

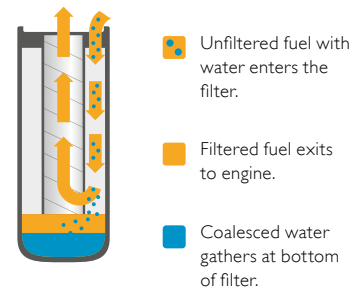
The elements to define filters performance are **water separation and filter efficiency.**

Water separation indicates the filter ability to separate water particles from fuel, gather them and drive them to the bottom of the filter. If the filter did not include this solution, water would follow the same path of the fuel, thus affecting the injection system.

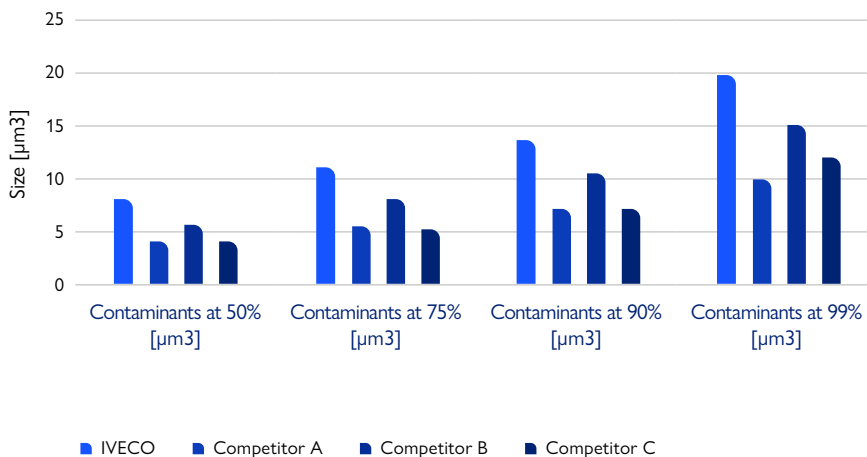
Water in fuel can cause significant damage – driven by rust and corrosion, resulting in lower efficiency, failure, and downtime for equipment owners. Accumulated water can be drained from the filter drain valve during recommended service intervals.

IVECO Genuine PreFilter leads the ranking in this test along with competitor A, while Competitor B and C showed poor results in separating water from fuel.

The filtration efficiency indicates the minimum contaminants dimensions that the filter manages to retain. It is related to the paper pore size and distance between them.



**Filtration Efficiency %**



Here, IVECO does not seem to be the best one but being the testing is on prefilter, it shows it fulfills its duties greatly. Indeed, the role of the prefilter is to retain the biggest particles thus working as a first filtration layer.

The smallest contaminants may continue to the second step of filtration where the main fuel filter lays and works more precisely by capturing even the tiniest contaminants.

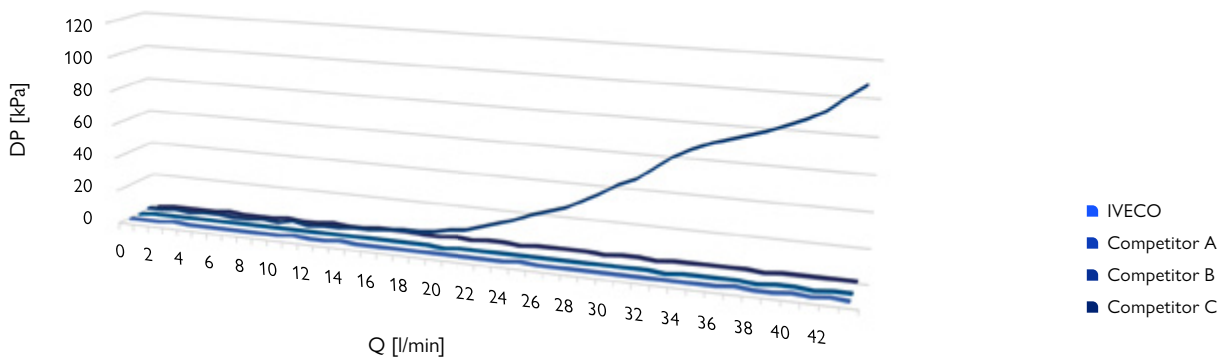
# Durability.



The elements to define filters durability are linked with performance and are **filtration performance** and **filter permeability**.

The filtration performance indicates the number of contaminants that the filter manages to retain before its functioning is compromised and thus, should be replaced.

## Pressure drop - iso 19438



The high filtering capacity and the quality of the original IVECO filter components allow to retain a greater number of contaminants without affecting the filter lifetime.

Tests show that the IVECO Genuine filter reaches the  $\Delta p$  (loss of pressure in the oil flow) later than its competitors when they are already saturated. Particularly, competitor B is the prefilter that failed the test.

Permeability values indicate the air flow going through the filtering element at a given pressure drop.

It is highly linked to and affected by the filtering element and its features such as structure, texture, pores dimensions (see **Quality**, page 7) and in turn it impacts on retention capacity.

Although we may think that filters need to be as less permeable as possible to avoid contaminants entering the injection system, the same is not applicable to the prefilters under analysis. Indeed, the prefilter should be more permeable, as working as a first filtration level: It **obstructs slower and lasts longer**.

Prefilters that retain smaller particles tend to obstruct before than others, as in the cases of Competitor A and B. IVECO Genuine prefilter offers the best level of permeability and retains the biggest particles, granting at the same time a high-quality degree of filtration and the best protection for the main filter and injection system.

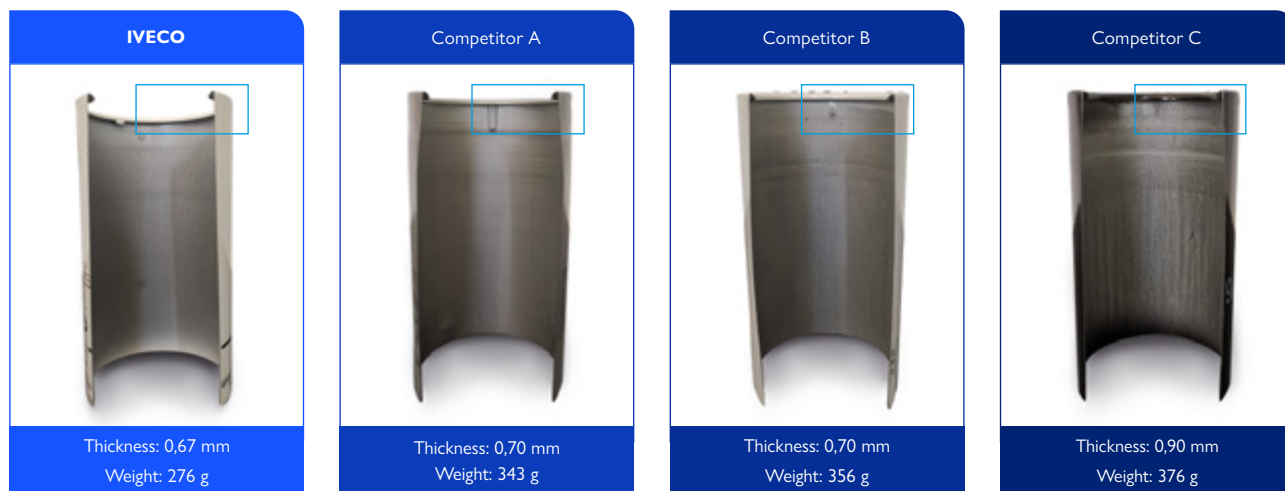


# Safety.

## IVECO values your safety.

Filters seem simple products and not related to the safety of a vehicle as the brakes can be, for instance. However, even in filters some details can make the difference in terms of safety and IVECO is a leader in this field.

The results of the tests conducted by DEKRA show that the IVECO fuel filter guarantees reliability and safety even in stressful situations such as blows, falls or water presence.



The correct thickness and robustness mix of the outer shell as well as of the threaded cover, in fact, allow a proper fuel flow, a greater protection for the filter in case of blows and resistance during handling and fixing.

Specifically, the threaded cover has two vital roles: avoiding oil leaks and detachments and allowing a proper oil flow. For this reason, the number of holes on the surface and their diameter are primary features that enable the correct oil flow and distribution along the filtering element.

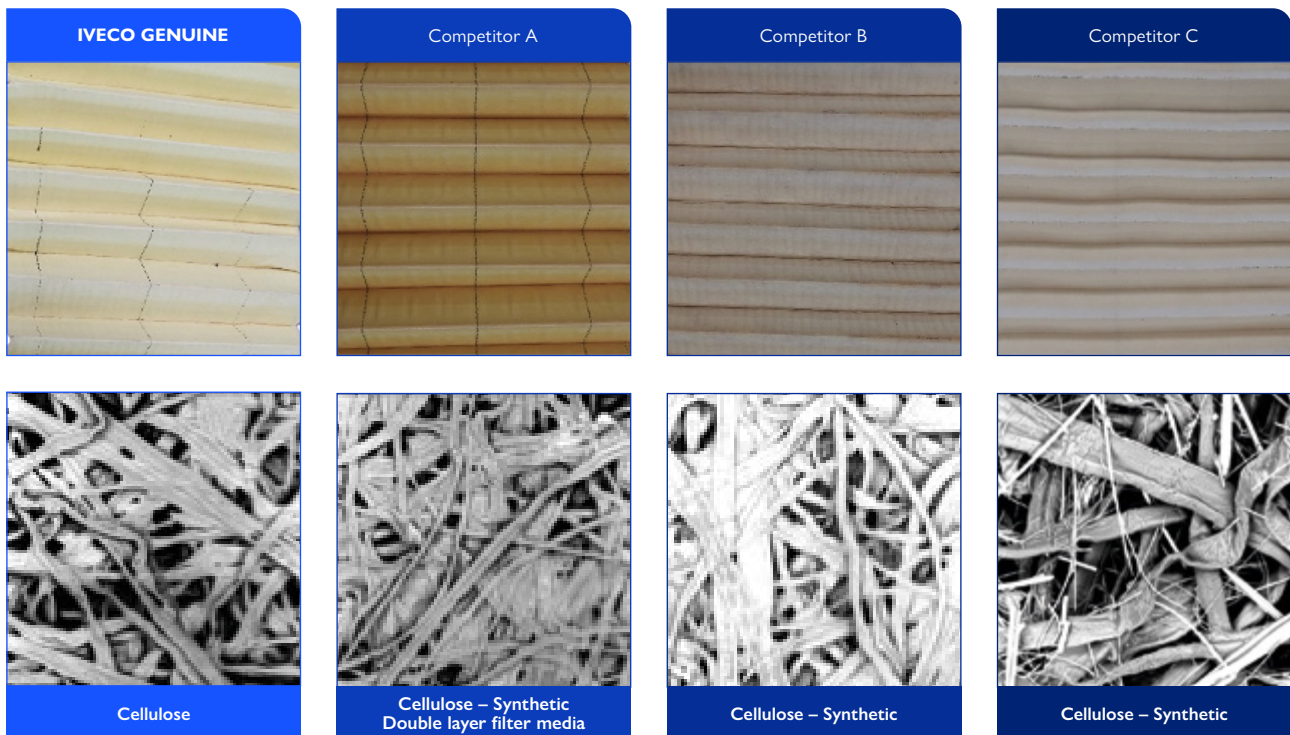


# Quality.

## Quality at its finest.

Safety and quality are correlated. The cover allows the correct fuel distribution through the filter and along the filtering surface, which can act more effectively.

Here, is where the filtering element works, and its specific features make the difference between proper and improper filtration. The right relationship between type of paper and its thickness, grammage and weft (cellulose and/or synthetic) allows to maximize the filtering efficiency.



The IVECO Genuine filter presents the optimal mix of features. Having the perfect combination of paper type (embossing as for Competitor C, while Competitor A and C come with smooth paper), and composition (cellulose), along with paper thickness and creases number (79, the second highest) IVECO filter stands out in the long run.

Another quality marker is the filter composition: a greater number of internal components with specific features allow the filter to operate optimally in all situations.

IVECO has the best equipped filter, fitting a complete range of components, among which:

- The dedicated drilled and anti-drain supports allow the correct distribution of the oil and ensure a longer lifecycle to the filter
- The cover and its threads, guaranteeing the correct flow of the oil during the inlet (to be filtered) and during the outlet (filtered) and the fixation, while avoiding leaks
- A dedicated fixing in the lower part which ensures the proper attachment to the condensation sewer, avoiding water leaks

A competitor may integrate some parts but not others. For this reason, IVECO is not only the best in quality but also the most complete, marking the highest score both for its components and overall.

# IVECO

Drive the road of change

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