

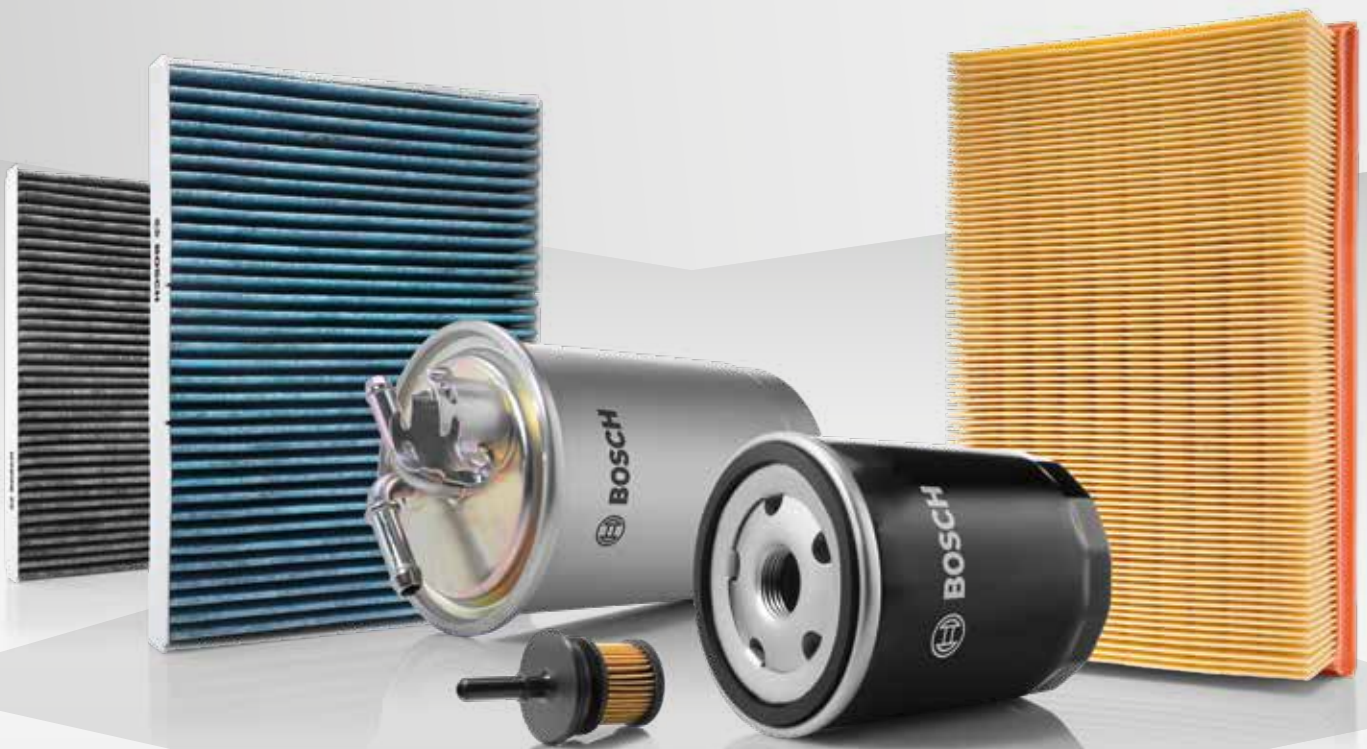


**BOSCH**

Invented for life

# FILTERS

Bodyguards for the engine



# Filters

## Overview

Bosch – a strong partner for filter businesses: Satisfied customers, low warehousing and ordering efforts, using state-of-the-art technologies – Bosch filters stand out for numerous convincing USP:

### Safety through outstanding product quality

High-quality materials, neat and accurate processing and well-defined quality checks – according to the same standards as for OE parts.

### System competence

Bosch develops and produces diesel and Denoxtronic injection systems and therefore knows how to protect them.

### Complete range from a single source

Easier handling and ordering thanks to a comprehensive program, which is permanently updated.

### High availability of goods

Bosch ensures quick availability of its parts by means of an international sales and logistics network.

### Strategic partner for the future

Suitable diagnostic solutions, training courses and seminars for wholesalers and workshops.

### A strong brand

13 times in a row, the readers of the German automobile magazine “auto, motor und sport” voted Bosch the best brand in the Filters category.



„auto motor und sport“,  
edition 07/2018



# Filters

## Product range



### Fuel filters

Bosch fuel filters protect the injection system. They reliably separate particles and water from fuel and contribute to optimum engine performance



### Oil filters

Bosch oil filters protect the engine. They reliably separate soot and metal abrasion from engine oil.



### Air filters

Bosch air filters protect the engine. They reliably separate particles from intake air and contribute to optimum engine performance.



### Standard cabin filters

Bosch standard cabin filters - for clean air inside the car.



### Activated carbon cabin filters

Bosch activated carbon cabin filters - for noticeably purer and more pleasant air inside the car.



### FILTER+ cabin filters

Bosch FILTER+ - a Plus for health, with anti-allergic and anti-bacterial effects. For superior air quality inside the car.



### Bosch Automotive catalog eCat-online

The quick way to find the matching product

- ▶ Free-of-charge online spare-parts catalog
- ▶ With a wealth of additional information and 360° product images
- ▶ Available in 28 languages



[www.bosch-automotive-catalog.com](http://www.bosch-automotive-catalog.com)



### Bosch filter program

- ▶ Complete range consisting of more than **2,500** filters
- ▶ Market coverage of appr. **95%**
- ▶ More than **200** new releases each year

# Filters

## Production

Ever since 1978, Bosch has been producing filters in Spain. Nowadays, the plant in Aranjuez develops and produces fuel filters, oil filter elements and Denoxtronic filters. In addition, it is also specialized on plastics.



► **Video:**  
How Bosch  
filters are  
produced



\*Surface: 64 310 m, staff: appr. 470

What makes Bosch so special: Closely cooperating with developers of gasoline and diesel injection systems, the filter developers gain first-hand knowledge about specific technical requirements.



**?** Did you know?

More than

**85 years**

ago, Robert Bosch first used a special paper for fuel filters – a material constantly improved ever since and still used today.



# Filters

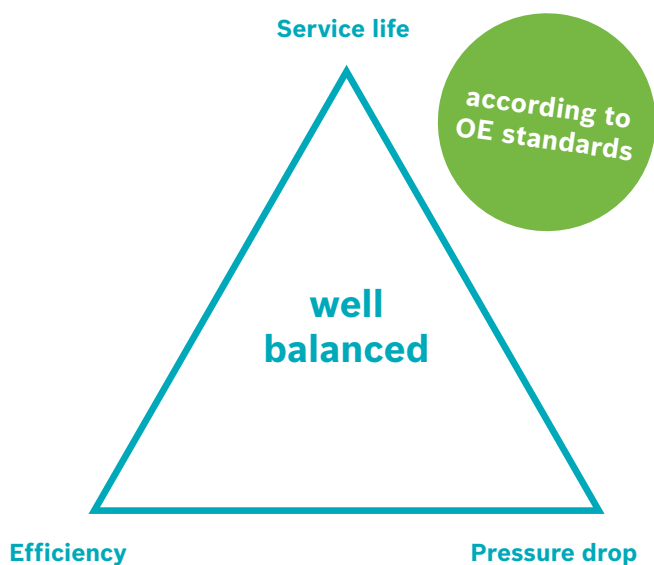
## Quality requirements

Product quality is not negotiable; there can't be any compromises in this regard. Besides high-quality materials and excellent processing, this includes optimized alignment of the filter specifications. These specifications influence one another. They must thus be exactly geared to each other in order to ensure outstanding filter performance.

**All functional and quality tests are performed according to the same standards applied to original equipment parts.**



### Magic triangle of filtration



### Service life (dust retention capacity):

the amount of particles a filter is able to retain before reaching the change interval – should be as high as possible

### Efficiency (particle separation rate):

the ratio of the number of particles retained by the filter to the number entering the filter, expressed as a percentage – should be as high as possible

### Pressure drop (differential pressure):

the difference in fuel/oil/air pressure between filter inlet and outlet – should be as low as possible

# Diesel filters

## Product details

Bosch diesel filters protect the injection system. They reliably separate particles and water from fuel and contribute to optimum engine performance.



► **Video:**  
See a fuel filter  
doing its job



### Advantages at a glance

- Excellent filter efficiency and reliable water separation due to multilayered, microporous filter media
- High dust holding capacity and low flow resistance due to large filter surface
- Moisture resistance and tensile strength due to specially impregnated filter media
- Protected against inner and outer leakage due to high-quality processing and usage of resistant materials



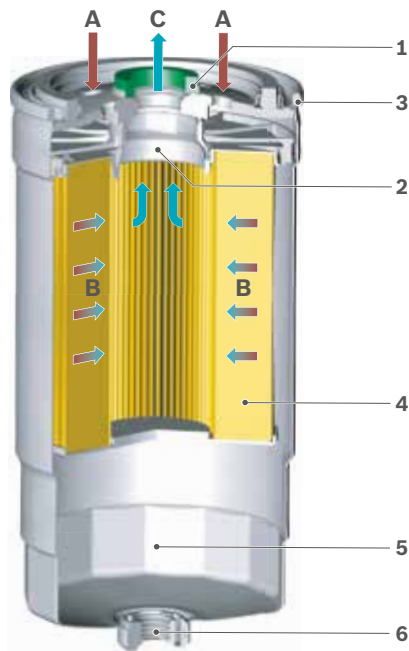
### Consequences of silted-up filters:

- Loss of engine power or even engine standstill
- Impairment of the fuel supply
- Impairments to the output of the fuel pump or even a short-circuit
- Internal corrosion of engine components

Change diesel filters regularly as specified by the vehicle manufacturer!

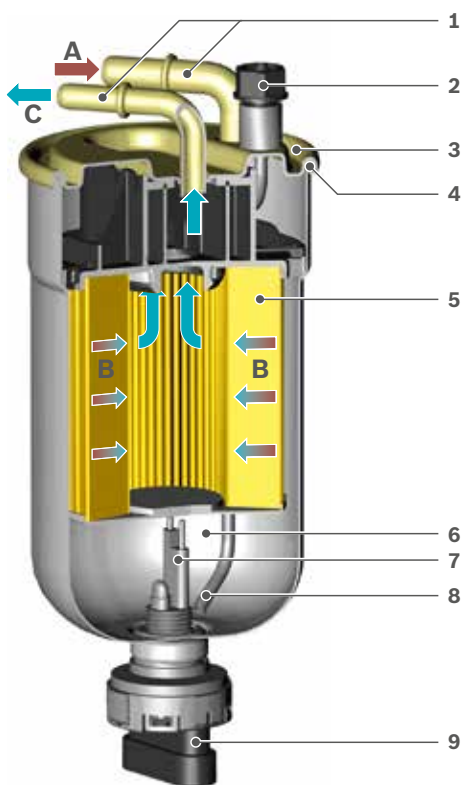
# Diesel filters

## Technology



### Design and operation of exchange boxes

- 1 Seal
  - 2 Threaded connection
  - 3 Double beading
  - 4 Multilayer filter medium
  - 5 Water accumulation chamber
  - 6 Water drain screw
- A Inflow of contaminated diesel  
 B Dirt and water filtration of diesel  
 C Cleaned diesel is conducted to the engine



### Design and operation of line filters

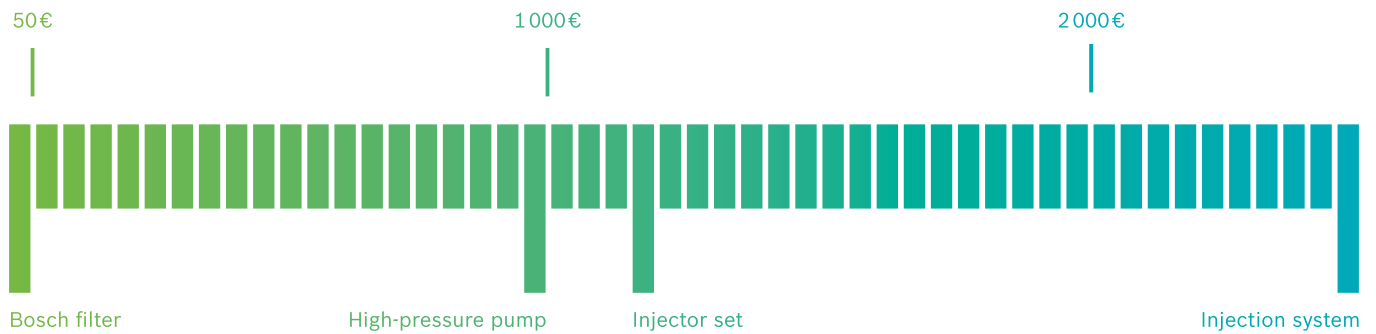
- 1 Hose connection
  - 2 Water drain
  - 3 Filter cover
  - 4 Double beading
  - 5 Multilayer filter medium
  - 6 Water accumulation chamber
  - 7 Water sensor
  - 8 Water drain tube
  - 9 Electrical connector for water sensor
- A Inflow of contaminated diesel  
 B Dirt and water filtration of diesel  
 C Cleaned diesel is conducted to the engine

# Diesel filters

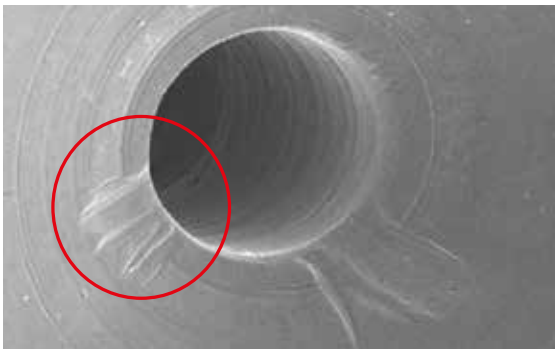
## Quality requirements

Cheap today, expensive tomorrow: With respect to fuel filters, those willing to save on the wrong things risk expensive damage to the injection system. Only quality filters are worth their price. They keep their promises.

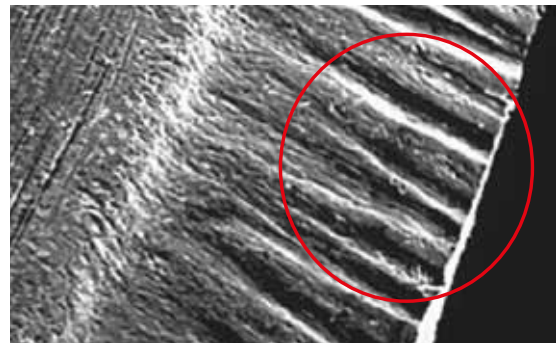
### Cost relations



### Damages on the injection system of an engine caused by non-separated particles and water



Material abrasion on the injector



Scoring on a piston



Corrosion at the high-pressure pump housing



Corrosion at the injector



# Gasoline filters

## Product details

Bosch gasoline filters protect the injection system. They reliably separate particles from fuel and contribute to optimum engine performance.



### Advantages at a glance

- ▶ Long service life and excellent filter efficiency due to multilayered, microporous filter media
- ▶ High dust holding capacity and low flow resistance due to large filter surface
- ▶ Moisture resistance and tensile strength due to specially impregnated filter media
- ▶ Protected against inner and outer leakage due to high-quality processing and usage of resistant materials



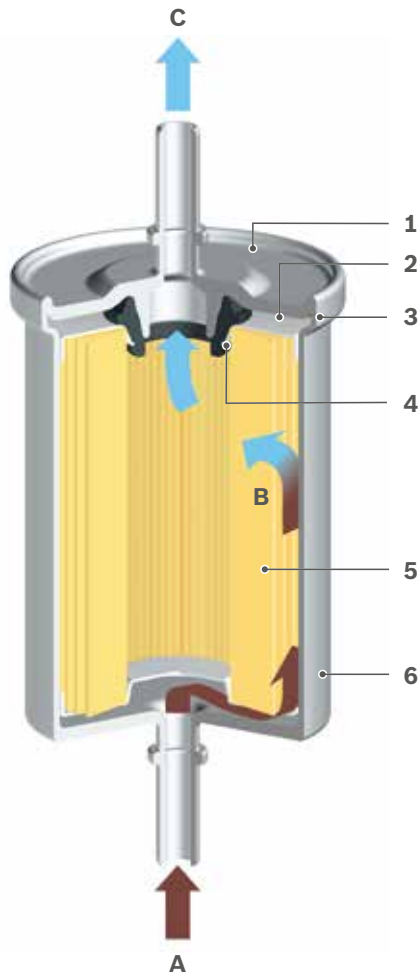
### Consequences of silted-up filters:

- ▶ Loss of engine power or even engine standstill
- ▶ Impairment of the fuel supply
- ▶ Impairments to the output of the fuel pump or even a short-circuit

Change gasoline filters regularly as specified by the vehicle manufacturer!

# Gasoline filters

## Technology



### Design and operation

- 1 Filter cover
  - 2 Supporting plate
  - 3 Internally welded edge
  - 4 Seal ring
  - 5 Filter medium
  - 6 Pressure-resistant filter housing
- A Inflow of contaminated gasoline  
B Filtration of gasoline  
C Cleaned gasoline is conducted to the engine

### Going strong as original equipment

In modern vehicles, fuel supply modules are installed into the fuel tank more and more often. The permanently integrated fuel filter in such modules lasts for the vehicle's entire service life and is no wearing part. Several vehicle manufacturers use Bosch fuel supply modules with an integrated Bosch gasoline filter as original equipment for their vehicles.

### Did you know?

Each and every fuel filter is subject to a leakproofness test performed with

## Helium

at a vacuum chamber.



# Oil filters

## Product details

Bosch oil filters protect the engine. They reliably separate soot and metal abrasion from engine oil.



► **Video:**  
See an oil filter  
doing its job



### Advantages at a glance

- Long service life of filter and engine oil due to multilayered, specially impregnated filter media
- High dust holding capacity due to large filter surface
- Excellent filter efficiency due to specially designed and well balanced filter components
- Reliable engine lubrication in almost all temperature and oil pressure conditions
- No oil loss by corrosion-resistant housing materials and seals made of special rubber



### Consequences of silted-up filters:

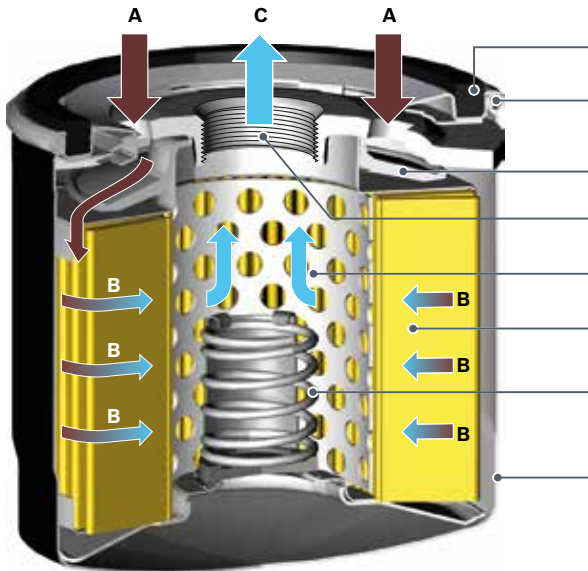
- Premature engine wear or even engine damage
- Reduced engine performance
- Increased oil consumption

*Change oil filters regularly as specified by the vehicle manufacturer!*

# Oil filters

## Technology

### Design and operation



- 1 Seal
- 2 Double beading
- 3 Non-return valve
- 4 Connection thread
- 5 Support jacket
- 6 Filter media
- 7 Bypass valve
- 8 Pressure-resistant filter housing

- A Inflow of contaminated oil  
 B Filtration of oil  
 C Cleaned oil is conducted to the engine

### Bypass valve

- ▶ Ensures continuous oil supply for the engine at low ambient temperatures (viscous oil) and protection when the filter is clogged at the end of service life through brief bypassing of the filter
- ▶ Less damage caused by impurities than by interrupted oil supply and cooling

### Non-return valve

- ▶ Prevents idling of the oil filter after switching off the engine
- ▶ Immediate lubrication at restarts thanks to quick buildup of pressure



### Urban traffic means stress for oil

Short-distance trips and frequent cold starts can cause an excess of fuel within the combustion mixture and increased condensation. That is, ...

- ▶ the oil is soiled by unburnt hydrocarbons and condensation causing premature aging of oil

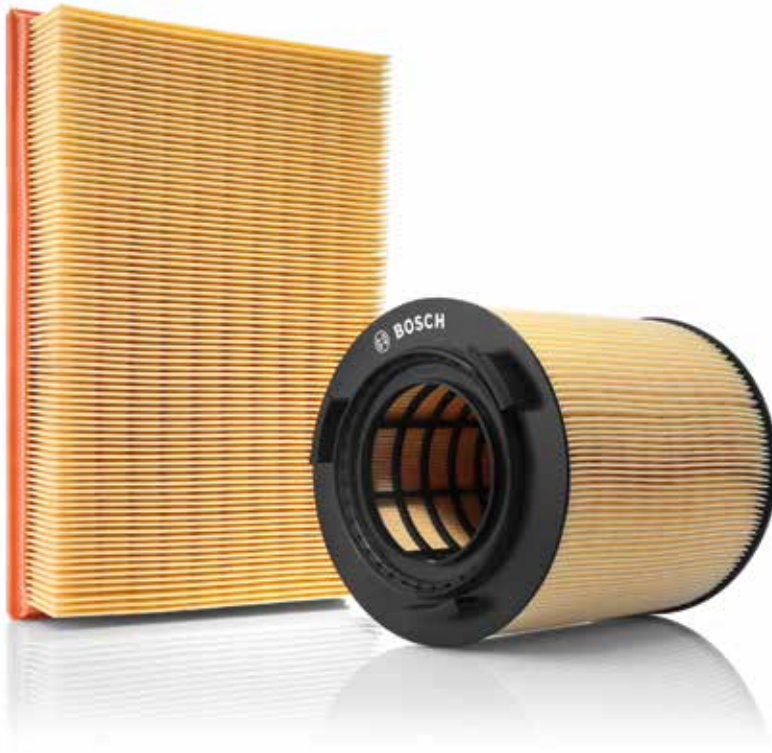
- ▶ at high engine temperatures, these components evaporate inside the oil circuit thus reducing the lubrication quality even further

Therefore: Use high-quality engine oil combined with Bosch quality filters in order to prevent premature oil aging.

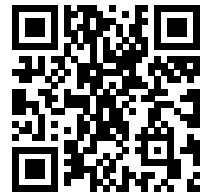
# Air filters

## Product details

Bosch air filters protect the engine. They reliably separate particles from intake air and contribute to optimum engine performance.



► **Video:**  
See an air filter  
doing its job



### Advantages at a glance

- Long service life, excellent filter efficiency, moisture resistance and tensile strength due to multilayered, specially impregnated filter media
- High dust holding capacity and low flow resistance due to large filter surface
- Robust fold geometry due to filter media with special embossing
- Appropriate fit due to precise dimensions and high-quality sealing materials



### Consequences of silted-up filters:

- Increased fuel consumption
- Reduced engine power
- Increased pollutant emissions

Change air filters regularly as specified by the vehicle manufacturer!

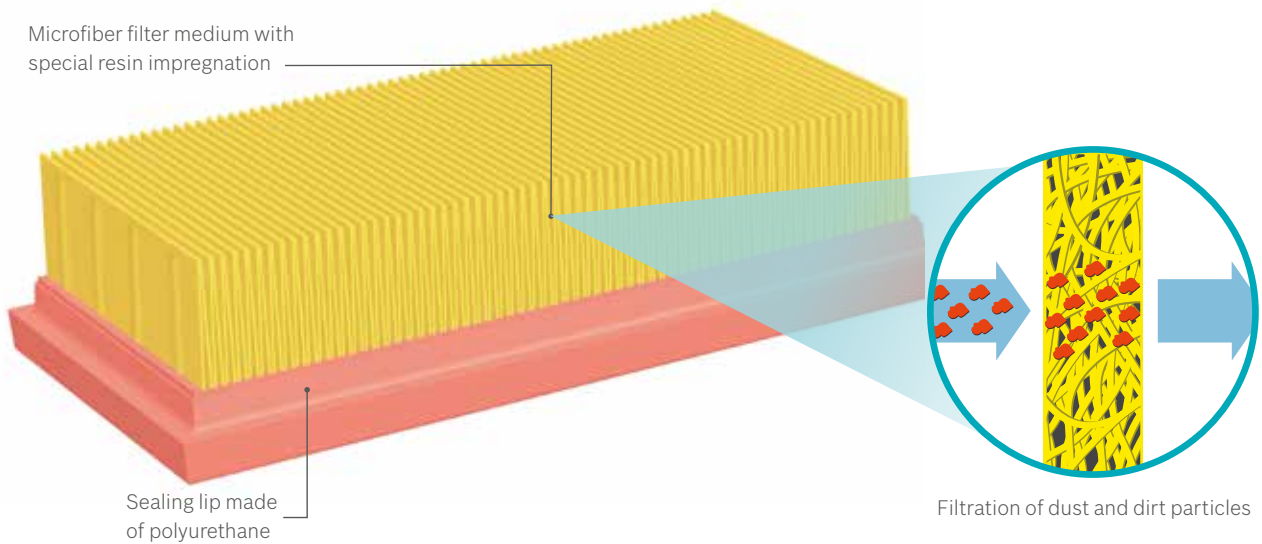


# Air filters

## Technology

### Design and operation

on the example of an air filter with polyurethane frame



### Hot-film air mass meter for precise mixture preparation

Hot-film air mass meters are sensors measuring the mass of intake air. They send this information to the engine control unit for an exact mixture preparation. They are usually fitted into the intake duct right behind the air filter.

For flawless operation, they need

- ▶ clean air
- ▶ a constant airflow without any disruptive turbulences

In this regard, air filters play an extremely important role.



### ? Did you know?

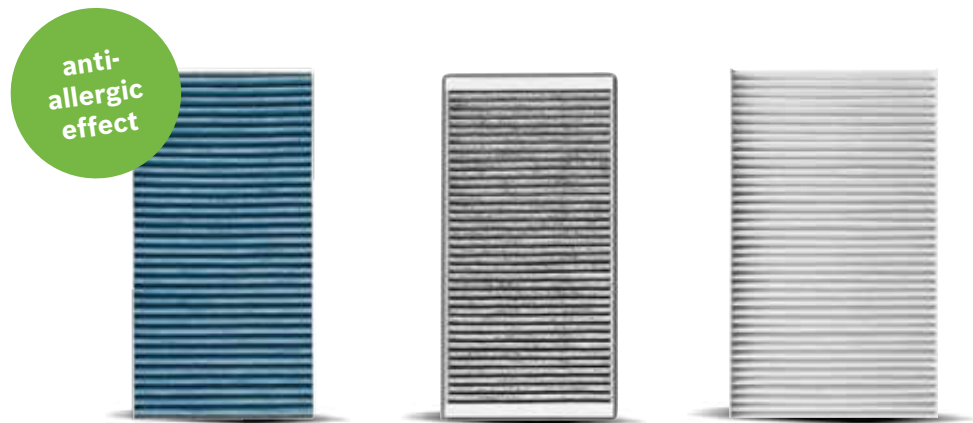
To burn one liter of fuel, a combustion engine needs






# 10,000

liters of clean air.

# Cabin filters

## Range and product details



Funktion	FILTER <sup>+</sup>	Activated carbon cabin filters	Standard cabin filters
	<b>Bosch FILTER<sup>+</sup></b> - a Plus for health, with anti-allergic and anti-bacterial effects. For superior air quality inside the car.	<b>Bosch activated carbon cabin filters</b> - for noticeably purer and more pleasant air inside the car.	<b>Bosch standard cabin filters</b> - for clean air inside the car.
Neutralizes allergens and bacteria	●		
Separates fine dust (up to 99 % of PM <sub>2,5</sub> μm)	●		
Separates foul-smelling and harmful gases (ozone, smog, exhaust gases)	●	●	
Separates pollen and fine dust (up to 100% of PM <sub>10</sub> μm)	●	●	●
Protects the air conditioning	●	●	●
Reduces dazzling effects	●	●	●
Coverage		 	 



### Consequences of silted-up filters:

- ▶ Poor vision due to misted windows, and thus reduced safety
- ▶ Increased concentration of pollutants inside the vehicle
- ▶ Allergic reactions, e.g. sneezing
- ▶ Restricted operation of the air conditioning system due to deposits on the evaporator

Bosch recommends to change cabin filters every 15 000 km or once a year.



### Did you know?

Allergies are on the rise. In Germany, appr.

# 20%

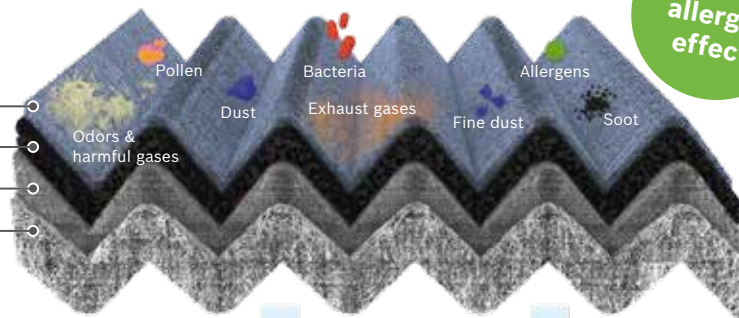
of the population suffers from allergies – among them also an increasing number of children.

# Cabin filters

## Technology

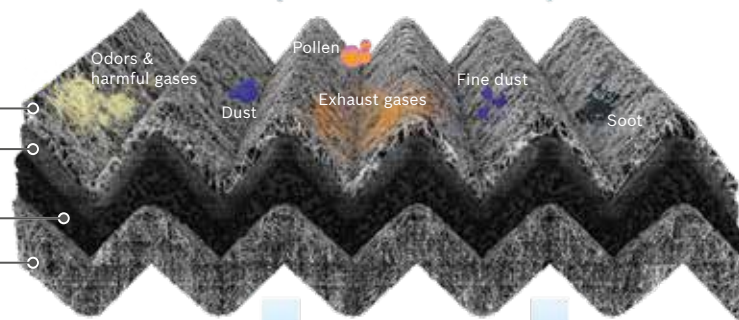
### FILTER+

- 1 Anti-allergy layer
- 2 Activated carbon layer
- 3 Ultrafine microfiber layer
- 4 Carrier fleece



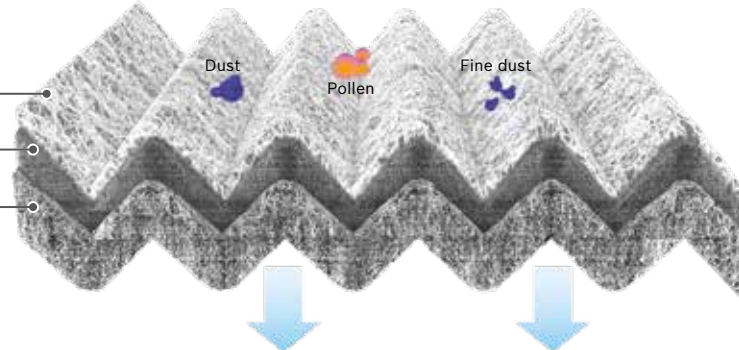
### Activated carbon filter

- 1 Prefilter
- 2 Ultrafine microfiber layer
- 3 Activated carbon layer
- 4 Carrier fleece



### Standard filter


- 1 Prefilter
- 2 Ultrafine microfiber layer
- 3 Carrier fleece



 Sales promotion

Movie clip on the Internet



 Did you know?

Bosch cabin filters come with instruction manuals included in the scope of delivery



# Know-how for professionals:

## ESI[tronic] 2.0 software and test equipment



### Advantages of ESI[tronic] 2.0 software

- ▶ Easy operation
- ▶ One standardized system across all brands makes
- ▶ Comprehensive market coverage
- ▶ Modular structure

### Everything about control unit diagnosis from a single source

Complex and connected vehicle systems demand increasingly well qualified diagnoses and comprehensive repair know-how from today's workshops – for engine management, mechanical and electronic components have converged in recent years. Bosch therefore offers workshops extensive knowledge and a complete range of test equipment from a single source. Modern, high-performance diagnostic equipment, technical trainings, and a hotline support workshops in all repairs on electronic systems.



### ESI[tronic] 2.0 software for diagnoses and servicing

ESI stands for "Electronic Service Information" and is the name of the software for servicing tasks. This includes:

- ▶ Professional ECU diagnosis
- ▶ Guided troubleshooting right on the system
- ▶ Experience-based repair – known faults  
Find the matching solution for your problem within seconds
- ▶ OEM-quality maintenance schedules and plans
- ▶ Interactive circuit diagrams





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### Tailor-made for workshops

ESI[tronic] 2.0 software is completely geared to the needs of workshops. Easy operation, quick access, and a standardized system across all brands make ESI[tronic] 2.0 software a user-friendly information tool. Comprehensive market coverage and constant updates are provided as a matter of course. The software packages have a modular structure – that is, a diagnostic specialist can subscribe to the specific "information types" of relevance for him.

[www.bosch-workshop-world.com](http://www.bosch-workshop-world.com)

### A complete range of test equipment

- ▶ Vehicle system analysis FSA
- ▶ Battery service BAT
- ▶ Air conditioning service ACS
- ▶ Wheel alignment FWA
- ▶ Tire changers TCE and WBE
- ▶ Headlight testing HTD
- ▶ Brake testers BSA
- ▶ Diesel component testing EPS

# Driven by efficiency

Bosch technologies are used worldwide in almost all vehicles. People, and assuring their mobility, is what we are focused on.

Therefore, we have dedicated the last 125 years of pioneering spirit and expertise in research and manufacturing to achieving this.

We continue to work on our unique combination of solutions for spare parts, diagnostic devices, workshop equipment and services:

- ▶ Solutions for efficient vehicle repairs
- ▶ Innovative workshop equipment and software
- ▶ The world's most comprehensive range of new and replacement parts
- ▶ Large network of wholesale customers, for quick and reliable parts supply
- ▶ Competent hotline support
- ▶ Comprehensive educational and training offers
- ▶ Targeted sales and marketing support

Find out more at:  
[bosch-automotive-aftermarket.com](http://bosch-automotive-aftermarket.com)

**What drives you  
drives us.**

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Automotive Aftermarket

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