

Drive better with cabin filters from MANN-FILTER

MANN FILTER

MANN-FILTER in OE quality

+ Filter media

- ⊕ Virtually 100% protection against particles including, for example dust, pollen, diesel exhaust, tyre residues and bacteria
- ⊕ Almost completely retains even the smallest solid particles triggering allergies
- ⊕ Wide variety of filter media: always suited to the relevant application
- ⊕ Innovative filter media used
- ⊕ Resistant to both high and low temperatures
- ⊕ Top quality, tried-and-tested materials for maximum load capacity (frame material, plastic etc.)
- ⊕ Quantity of activated carbon adapted to meet environmental (= vehicle manufacturers') specifications
- ⊕ Almost completely eliminates odours and harmful gases such as ozone, exhaust gases, nitrogen oxides, fuel gases etc.
- ⊕ On average, the carbon particles on the surface area of a MANN-FILTER would cover 26 football pitches (ca. 160.000 m²)
- ⊕ The filter media in MANN-FILTER products meet vehicle manufacturers' specifications

+ Exact fit

- ⊕ MANN-FILTER products are ideally adapted to the installation space available
- ⊕ Optimum pleating to utilise the full capacity of the filter medium
- ⊕ The dimensions of the filter are always identical
- ⊕ Optimum fit through patented design and sealing solutions
- ⊕ Filters designed with curved and complex geometry, depending on the installation space

+ Protection against contamination

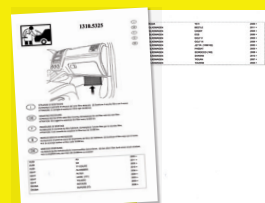
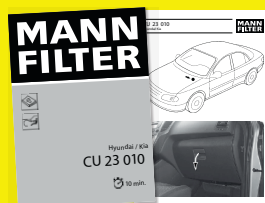
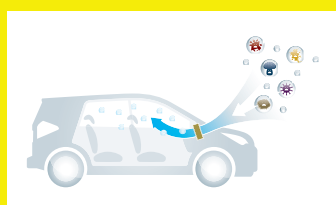
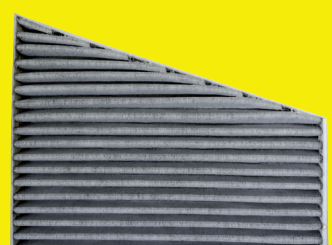
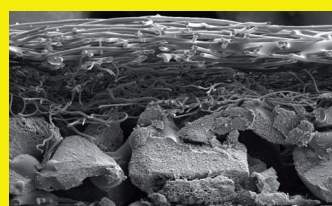
- ⊕ Prevents build-up of dirt which can lead to failure of the air conditioning or heating system
- ⊕ No reduction in cooling efficiency of the air conditioning system
- ⊕ Contaminant dust particles cannot enter the passenger compartment
- ⊕ MANN-FILTER cabin filters keep the passenger compartment clean, helping to maintain the value of the vehicle
- ⊕ Uniform pleating for optimum filtration performance

+ Filter change

- ⊕ Highly flexible filters for specific installation conditions
- ⊕ Detailed, illustrated installation instructions to change the filter quickly and easily
- ⊕ Optimum installation, even with PUR foam gaskets (no sticking)
- ⊕ All MANN-FILTER products packed as standard in strong individual boxes to protect during transit

+ To the point

- ⊕ All MANN-FILTER brand cabin filters are tested to the applicable standard (DIN 71460/ISO 11155)
- ⊕ Through perfectly filtered air, MANN-FILTER cabin filters help the driver to keep alert, significantly reducing the risk of accident
- ⊕ Consistently efficient performance of the filter guarantees optimum protection for people suffering from allergies
- ⊕ Optimum performance for man and machine with regard to separation capacity, air throughput, dust holding capacity and adsorption capacity



Inferior quality

Filter media

- ⊖ Poor performance through inferior quality filter media
- ⊖ Only coarse particles (> 5 microns) are retained
- ⊖ Limited variety of filter media, medium often not adapted to the application (one medium for all filter types)
- ⊖ Use of low-cost activated carbon, making it virtually impossible to meet environmental specifications
- ⊖ Deformation of pleats, even after minor changes in temperature
- ⊖ Poor load capacity through inferior quality material
- ⊖ Quantity of activated carbon generally far too low
- ⊖ Inadequate or no elimination of odours and harmful gases
- ⊖ An inferior quality filter often contains only half the carbon particles on its surface area, compared with a MANN-FILTER
- ⊖ The filter media used are not adapted to meet the vehicle manufacturers' specifications

Exact fit

- ⊖ Filters do not completely fit the installation space available
- ⊖ Efficiency of the filter medium reduced due to slanting or curled pleats
- ⊖ Dimensions of filter (LxWxH) vary from batch to batch
- ⊖ Rattling sound through poorly fitting filters
- ⊖ Inadequate adhesion between filter medium and frame, resulting in leakage of activated carbon

Protection against contamination

- ⊖ Increased risk of servicing costs through failure of the air conditioning or heating system - caused by build-up of dirt
- ⊖ Reduction in cooling efficiency of the air conditioning system, e.g. through contamination of the heat exchanger or fan motor, leading to higher fuel consumption
- ⊖ Passenger compartment gradually becomes dirty, reducing the value of the vehicle
- ⊖ Impaired air supply through distorted pleats

Filter change

- ⊖ Inflexible design, making them difficult to fit
- ⊖ Installation instructions not available, or only briefly outlined
- ⊖ During installation, gasket can stick or be displaced = loss of seal/leakage
- ⊖ No protection during transport because filters are often packed only in plastic film

To the point

- ⊖ Generally no know-how and laboratory equipment
- ⊖ Inadequately filtered air causing adverse physical effects such as tiredness or headaches
- ⊖ Filter change necessary before recommended service interval / frequently filter change will breed to higher servicing costs
- ⊖ More frequent filter changes = higher maintenance costs
- ⊖ A superficial 'look-alike' is not enough

Drive better with fuel filters from MANN-FILTER

**MANN
FILTER**

MANN-FILTER in OE quality

+ Protective cover

- ⊕ Prevents even the slightest contamination and protects the sensitive fuel injection system against particles and wear

+ External seal

- ⊕ Complete seal to the engine compartment (vehicle)
- ⊕ Filter cannot loosen when the engine is running
- ⊕ Reliable at extremely low and high temperatures

+ Screw cap

- ⊕ Exact fit through firmly moulded base of gasket
- ⊕ Seated gasket to ensure optimum seal
- ⊕ Mechanical and dynamic stability through ideal design of screw cap
- ⊕ Optimum surface coating for maximum corrosion protection

+ Internal seal

- ⊕ Filtered fuel completely sealed
- ⊕ Prevents by-pass of contaminated fuel
- ⊕ Reliable at extremely low and high temperatures
- ⊕ Resistant to commercially available fuels

+ Element

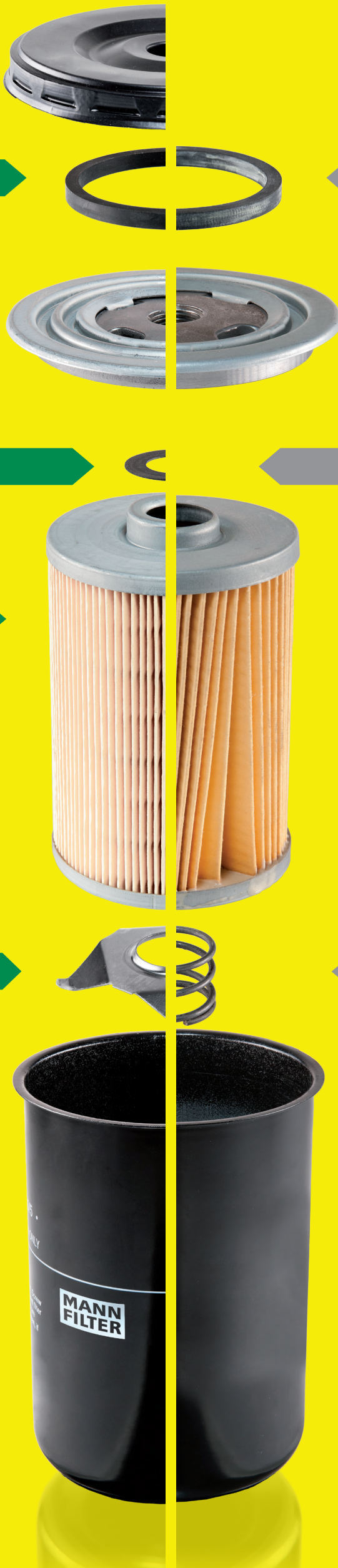
- ⊕ Corrosion-resistant metal end cap
- ⊕ Firm support pipe for high stability under pressure leads to high mechanical load capacity
- ⊕ Very fine MULTIGRADE F filter media with maximum dust holding capacity provides optimum protection against wear
- ⊕ Meets vehicle manufacturers' demanding requirements for modern fuel injection systems
- ⊕ Long service life through star-pleated filter element
- ⊕ Special impregnation ensures even pleat spacing and position

+ Element guide

- ⊕ Axial and radial guide prevents movement of the element and thus leakage at interfaces

+ Canister

- ⊕ Optimum surface coating for maximum corrosion resistance
- ⊕ High compressive strength and pulsation resistance
- ⊕ Maximum operating reliability



Inferior quality

Protective cover

- ⊖ Protective cover often not supplied
- ⊖ Contamination can occur
- ⊖ Possible premature failure of the fuel injection system

External seal

- ⊖ Inadequate seal to the engine compartment
- ⊖ Possible loosening of filter when the engine is running – risk of fire
- ⊖ Loss of fuel – risk of fire

Screw cap

- ⊖ Inadequately moulded base of seal
- ⊖ Possible loss of seal with associated risk of fire
- ⊖ Lack of stability can cause cover to split with risk of massive fuel leakage
- ⊖ Corrosion through lack of surface coating

Internal seal

- ⊖ No seal present
- ⊖ Filter leaks
- ⊖ Inadequate engine protection – wear on engine

Element

- ⊖ No corrosion protection
- ⊖ Filter bellow inadequately supported as no supporting pipe present
- ⊖ Poor filtration due to inferior quality filter media
- ⊖ Does not meet vehicle manufacturers' current requirements for modern fuel injection systems due to poor filtration performance
- ⊖ Inadequate wear protection for the fuel injection system
- ⊖ Uneven and slanting pleats lead to increased pressure loss and reduced service life

Element guide

- ⊖ The element may be inadequately fixed as there is no radial positioning, resulting in leakage

Canister

- ⊖ No surface coating, resulting in corrosion
- ⊖ Canister can burst due to inferior material or inadequate thickness of canister
- ⊖ Severe leakage with loss of fuel possible through split in canister

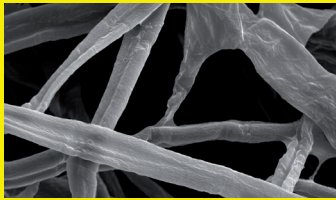
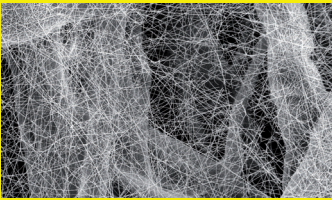
Drive better with air filters from MANN-FILTER



MANN-FILTER in OE quality

+ Filter media

- ⊕ Filter media selected for the individual application to OE specifications
- ⊕ Full filtration performance throughout the service interval plus reserve capacity
- ⊕ Sustains consistently high engine performance
- ⊕ Optimum protection for the engine, air flow mass meter and other sensitive components



+ Seal

- ⊕ Firmly fitting MANN-FILTER PUR foam gasket
- ⊕ Fits perfectly in the filter housing
- ⊕ Sealing contour aligned with the housing
- ⊕ Resistant within all normal temperature ranges
- ⊕ Retains the necessary elasticity throughout the service interval

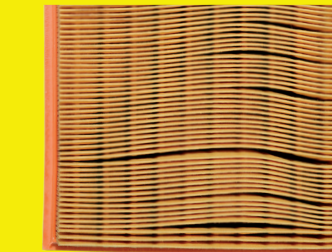


+ Stabilisation

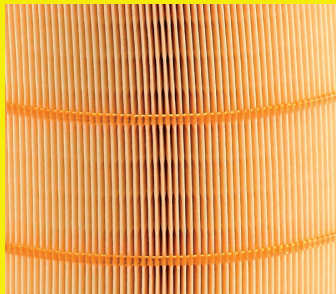
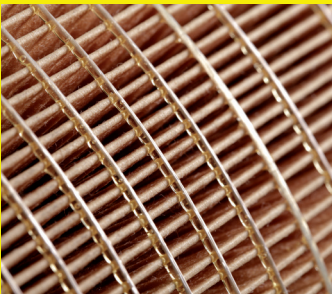
- ⊕ Optimum pleat geometry and stability, even under heavy load
- ⊕ Special embossing process for filter medium
- ⊕ Top quality impregnation providing high chemical resistance and mechanical stability
- ⊕ Provides optimum prerequisites for the air flow mass meter to function efficiently



- ⊕ Consistently high filtration performance even in humid and wet conditions



- ⊕ Depending on application, elements are stabilised with glue beads, supporting inserts or spiral wound technology



+ Safety

- ⊕ Protective fleece medium on the air filter (pre-filtration in dusty environments, also water and snow separation)
- ⊕ Stronger protection against vehicle fires through flame-retardant filter impregnation: when in contact with a smouldering cigarette sucked in through the air intake, the risk of fire is substantially reduced



Inferior quality

- Filter media

- ⊖ Standard filter media without reference to its application
- ⊖ Premature service may be necessary
- ⊖ Contamination of the air flow mass meter results in incorrect readings and increased fuel consumption
- ⊖ Inadequate supply of air to the engine with possible loss of power
- ⊖ Possible increase in engine wear

- Seal

- ⊖ Gasket too soft/too hard
- ⊖ Leakage, e.g. through brittleness
- ⊖ Use of critical materials such as PVC
- ⊖ Unfiltered air reaches the engine
- ⊖ Increased wear to the engine
- ⊖ Inadequate temperature resistance

- Stabilisation

- ⊖ Pleats inadequately embossed
- ⊖ Unstable element, unreliable function
- ⊖ Unsuitable impregnation with poor chemical resistance and mechanical stability

- ⊖ Inconsistent filtration performance in humid and wet conditions
- ⊖ Bunching of pleats through ingress of water following, for example, heavy rain, leads to incorrect signals from the air flow mass meter and to a shorter service interval

- ⊖ Stabilising inserts or technologies missing or inadequate

- Safety

- ⊖ Without flame-retardant impregnation, the air filter may start to burn when in contact with a smouldering cigarette sucked in through the air intake

Drive better with oil filters from MANN-FILTER



MANN-FILTER in OE quality

+ Gasket

- ⊕ Optimum sealing quality
- ⊕ Complete seal during the entire service interval
- ⊕ Filter cannot loosen when the engine is running
- ⊕ Reliable also at extremely low temperatures



+ Screw cap

- ⊕ Precisely fitting thread
- ⊕ Easy assembly and disassembly
- ⊕ Firmly moulded base of gasket creates a secure fit



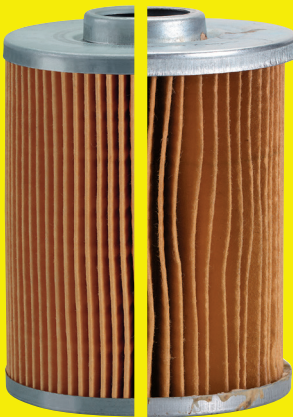
+ Anti-drain valve

- ⊕ Specially moulded component for reliable operation
- ⊕ No drainage from filter and oil ducts
- ⊕ Immediate pressurisation on starting
- ⊕ Maximum service life through high degree of flexibility and stability



+ Filter media

- ⊕ Optimum pleat geometry for a minimum differential pressure
- ⊕ High dust holding capacity
- ⊕ Maximum filtration performance through top quality materials
- ⊕ Long service life
- ⊕ Special embossing processes provide uniform pleat spacing and thus maximum filtration performance
- ⊕ High mechanical durability
- ⊕ Filter media adapted to suit the specific application



+ Bypass valve

- ⊕ Precise function throughout the service interval
- ⊕ Valve opening pressure tuned to engine data
- ⊕ High quality elastomer seal
- ⊕ Bypass valve functions even at low temperatures (anti-freeze)
- ⊕ Maintains complete seal
- ⊕ Provides optimum oil supply to the engine



+ Element guide

- ⊕ Axial and radial positioning
- ⊕ Prevents movement of the element and thus leakage at the interface between the element and the screw cap



+ Filter housing

- ⊕ Pressure-resistant
- ⊕ Reliable operation
- ⊕ No leakage
- ⊕ No oil loss
- ⊕ Corrosion-resistant



+ Release device

- ⊕ Filter can be changed quickly
- ⊕ No slippage
- ⊕ Filter can be released easily, even under difficult conditions and with restricted installation space



Inferior quality

Gasket

- ⊖ Produced from inferior materials
- ⊖ Inadequate seal
- ⊖ Possible loosening of filter when the engine is running
- ⊖ Possible loss of oil

Screw cap

- ⊖ Inaccurately machined thread
- ⊖ Possibly difficult to mount
- ⊖ Inaccurately moulded base of gasket
- ⊖ Possible loss of seal
- ⊖ Possible loss of oil

Anti-drain valve

- ⊖ Produced with a simple design using inferior materials
- ⊖ Possible drainage from filter and oil ducts
- ⊖ Delay in pressure build-up on starting
- ⊖ Short service life
- ⊖ Possible damage to seal with leakage within a short period

Filter media

- ⊖ Small filter surface area through irregular pleat spacing
- ⊖ Reduced dust holding capacity. Unfiltered oil can thus flow through the bypass valve within a short period
- ⊖ Poor filtration performance through inferior quality materials
- ⊖ Short service life
- ⊖ Inadequate separation performance
- ⊖ Only standard filter media for all applications

Bypass valve

- ⊖ Precise function cannot be guaranteed
- ⊖ Valve opening pressure is not tuned to the engine resp. is undefined
- ⊖ Inadequate supply of oil to the engine
- ⊖ Poor quality seal or unsuitable material
- ⊖ Possible bypass with shut valve

Element guide

- ⊖ Only axial positioning
- ⊖ Without radial positioning, the element can be inadequately fixed, resulting in leakage

Filter housing

- ⊖ Thin, unprotected material
- ⊖ Possible leakage within a short period
- ⊖ Oil loss
- ⊖ Corrodible
- ⊖ Oil filter can burst

Release device

- ⊖ Not available/poorly designed
- ⊖ Difficult disassembly
- ⊖ Can tip and slip
- ⊖ Release device may come off