

# Air Filtration FACT SHEET



## The Importance of Air Filtration

For every litre of fuel consumed, a modern diesel engine typically requires 15,000 litres of air! Therefore, poor air quality can significantly impact engine wear and performance. As a result, effective Air Filtration is essential, to protect the engine from particulate contaminants. Symptoms of poor maintenance include plugged Air Filters, reduced engine performance and higher fuel consumption.

## Dust >> Restriction >> Filter Life Time

The life of an engine is determined by the rate at which it ingests abrasive contaminants. Approximately 1 gram of dust per HP is sufficient to destroy an engine. Unlike the human body, which has different filtration systems and sensors to warn of bad air, the Air Filter is the only protection on an engine against potential damage. It has one chance, and one chance only, to remove the dust. As the filter progressively removes contaminants, the level of restriction increases. Like a congested nose, it takes an engine more effort to draw in air when the Air Filter is blocked. The engine will find it difficult to breathe due to high restriction - reducing power output and increasing fuel consumption. In order to have a visual indication of filter life, a Restriction Indicator should be mounted on the clean side of the housing.

! Different working environments require different Air Filtration solutions. Marine applications are not normally subject to high dust concentrations, but will experience salt-laden moist air. At the other extreme construction, agriculture and mining equipment is exposed to very high levels of dirt.

## Low Dust Concentration Requires Light-Duty Air Filtration

A light-duty Air Cleaner will normally consist of a Single Stage Air Cleaner housing.

## High Dust Concentration Requires Heavy-Duty Air Filtration

A heavy duty Air Cleaner system includes:

- Dual Stage Air Cleaner housing (which includes pre-cleaning)
- Main filter element
- Safety filter element\*

! \*The safety filter is often wrongly referred to as a 'secondary filter' because it is placed after the main filter. However the safety filter does NOT remove fine particles at a higher efficiency than the main filter element. It is there solely in case of a main filter defect and to prevent dust ingress when the main filter is being changed. The safety element should only be changed every 3rd time the main filter is replaced

## Air Filter Service Life

OEM's use various techniques to extend the service life of an Air Filter. Options include:

- Pre-cleaners such as fins fitted to the element, Air Cleaner housings with offset air intakes or ejective Air Pre-filtration units
- Air Filters with larger media areas – such as Fleetguards Magnum range
- Restriction indicator gauges (optimizing filter life)

## Fleetguard Product Range

! Cummins Filtration has a full range of replacement Air Filter elements, both PU and conventional metal-ended. These cover the many varieties of filter designs found in the market place. In addition, our broad product line also offers a range of Air Cleaner housings in composite and metal options complemented by accessories such as hoses, clamps, brackets and weather hoods etc.

## Advanced Air Intake Systems

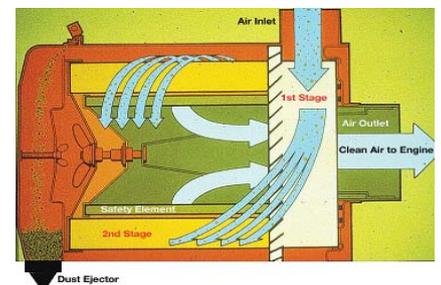
Composite Fleetguard Air Cleaner concepts have introduced new design features to reduce restriction;

- OptiAir™ reduces restriction by enlarging the air outlet of the air filter element
- Direct Flow™ Air Cleaner housings utilize a more direct flow path into the engine avoiding the normal directional changes associated with a standard Air Cleaner housing.



1g of dust ingested per engine horsepower is enough to destroy the engine

## Dual Stage Heavy Duty Air Cleaner



### 1st stage:

Dirty air passes fins - large particles are centrifuged out

### 2nd stage:

Pre-cleaned air passes through main filter



Dual Stage Air Filtration System including restriction indicator for high Dust Environment



State-of-the-Art:  
Direct Flow™ Air Filtration System

# Check your knowledge about Air Filtration

## 1 How do you know when to change an air filter element?

- a) When the filter looks dirty
- b) At the same time as changing the fuel and oil filters
- c) By using a restriction indicator gauge

## 2 What is the purpose of the safety filter?

- a) To improve the efficiency and capacity of air cleaner
- b) To provide basic protection in case of a defect with the main filter
- c) To increase the flow rate through the air intake system

## 3 What is restriction?

- a) Restriction is the resistance to flow created by the induction system and air filter
- b) The amount of space available to install the air cleaner housing
- c) The maximum period of time allowed between filter changes

**Answers:**  
a) 3  
b) 2  
c) 1

Other Fact Sheets available:



**Fuel Filtration**  
LT36179



**Lube Filtration**  
LT36180



**Hydraulic Filtration**  
LT36182



**Coolant**  
LT36181