

Pleatsorb – The hydrocarbon trap from MANN+HUMMEL

Intercepting HC emissions in the air intake system

A hydrocarbon trap catches hydrocarbon (HC) emissions after the engine has been shut off. Using activated carbon, it adsorbs and retains the environmentally harmful fuel vapors before they can escape into the atmosphere.

When the engine is restarted, the captured HC molecules are released by the flow of intake air, drawn into the combustion chamber and incinerated.

In some states, California and the so-called Green States, legislation limits the allowable emissions of hydrocarbons (HC) from vehicle after engine shut-off.

Starting in 2007, the strictest limits apply to PZEV (Partial Zero Emission Vehicles). In a defined 24-hour test cycle, such vehicles may not release more than 0.35 g HC in “hot stop” emissions. Fuel related emissions must contain less than 0.054 g HC. This corresponds to approximately one drop of fuel.

The MANN+HUMMEL hydrocarbon trap is a suitable way to address HC emissions compliance requirements.

Under normal circumstances, after an engine is shut off, many of the engine’s intake and exhaust valves will remain partially open. Thus, unburned hydrocarbons from the fuel can escape into the atmosphere, following a path through the intake manifold and air filter. The HC trap adsorbs the emissions before they can escape from the air intake system - Thus only a fraction of the otherwise emitted harmful fuel vapors are released.

The efficiency of a hydrocarbon trap depends on selecting the correct activated carbon, as well as the design and fit of the element in the air intake system. The HC trap must also be able to withstand harsh conditions, such as high temperatures and vibration, in the under hood environment. Also, no significant loss of flow should occur during adsorption or desorption of the HC.

HC traps are built to last the life of the vehicle, and are therefore not serviceable or removable. The required service life is currently 15 years or 150,000 miles.



MANN+HUMMEL: A leader in HC traps

Optimum components

A hydrocarbon trap consists of activated carbon, held in place between layers of air-permeable supporting media. This design achieves a large effective surface area and reduces pressure losses through the special arrangement of pleats.

The adsorption and desorption rate of the HC trap are dependent upon the type of activated carbon chosen - The operating capacity can also be set over a wide range, depending on the design of the system.

Possible positioning

The HC trap can be designed as either a "full-flow" system, or a "by-pass" design. As a full-flow element, the HC trap is 100 % in the airflow cross-section, thus it virtually eliminates the escape of hydrocarbons into the atmosphere. With the by-pass version, it is crucial to optimally position the filter in the air intake system to achieve effective HC adsorption. The HC trap is mounted on the clean air side - generally by means of a non-detachable connection downstream of the air filter element.

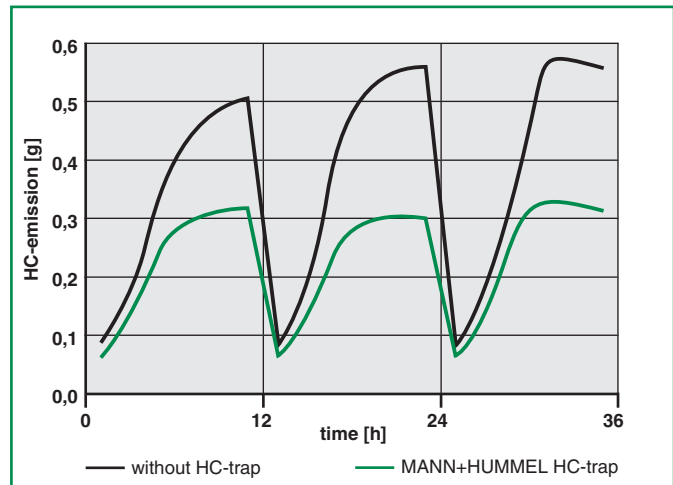
Custom-made solution

As a full service air intake supplier, MANN+HUMMEL supports our customers with design, selection of activated carbon and any adjustment required for optimum flow solutions.

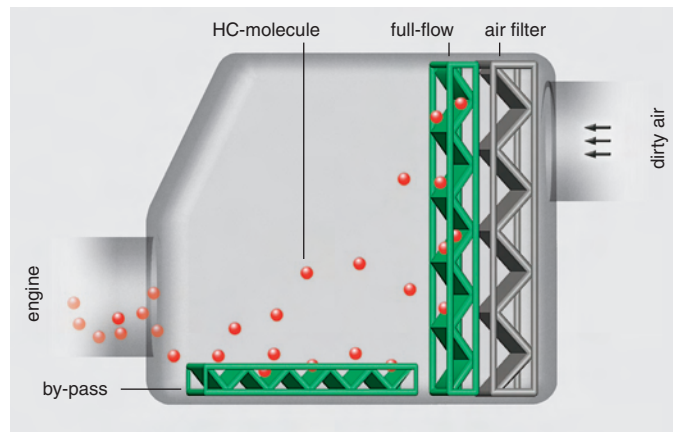
The basic characteristics of the HC trap and its application in the air filter are tested in accordance with the customer's specification at MANN+HUMMEL's state of the art laboratory, using specialized testing equipment.

We are constantly developing our testing technology to meet international standards.

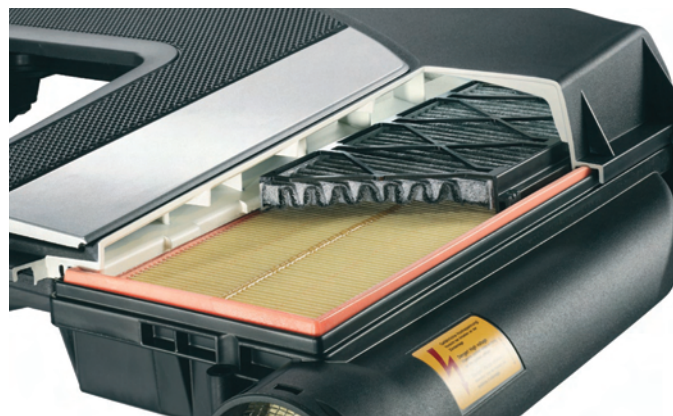
HC trap in SHED testing process (3-day test)



HC trap positions in air cleaner environment



Cross-section view of Pleatsorb - full-flow version in an air cleaner



Advantages of the MANN+HUMMEL HC trap

- Optimum adsorption and desorption
- Low pressure loss
- Very easy to recycle
- Integration into full-flow and by-pass concepts
- Many years' experience with activated carbon
- Competence in testing technology



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