

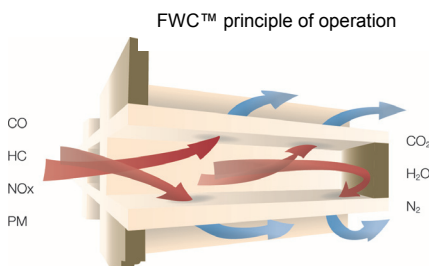
EMPRO™ FWC™ Catalyst

Four-way conversion catalyst

The innovative single component FWC™ catalyst can remove Particulate Matter (PM), as well as CO (Carbon Monoxide), HC (Hydrocarbons) and NOx (Nitrogen Oxides) from gasoline-engine exhaust.

The traditional TWC (Three-Way Conversion) catalyst, used for gasoline-engines, removes CO, HC and NOx. However, new emission regulations such as Euro 6, also require PM control.

The innovative FWC™ catalyst combines the functionality of a TWC catalyst with a filter to remove all four pollutants with just one component.



Lower PM Limits

The European Commission has decided to implement new standards for the maximum number of particulates in two phases:

- Phase 1 (Euro 6) started with an initial limit of $6 \times 10^{12}/\text{km}$ in 2014
- Phase 2 (Euro 6c) will tighten the limit to $6 \times 10^{11}/\text{km}$ in 2017



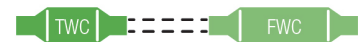
Particulate control approach

General approaches to meet the challenging PN (particle number) regulations include an additional filter in the exhaust system.

Different after-treatment system configurations lead to different technologies to meet customer requirements.

BASF has developed innovative FWC™ catalyst technologies that can be applied in a system, together with a standard TWC, as a CC (Close Couple) or UF (Under-Floor) or even as a FWC-only device for a fully integrated system.

FWC UF application



FWC CC application



Fully integrated system



Figure 1: System configuration with FWC catalyst

Benefits

- Smart solutions to lower backpressure impact
- Potential to reduce package design
- Ensure particulate emissions below tight regulation limits
- Reduction in system complexity, tooling and overall system cost

About EMPRO™

Protecting the atmosphere from harmful emissions is the focus of all EMPRO innovative solutions. As the global leader in catalysis, BASF has unsurpassed expertise in developing innovative emission control technologies for a wide range of applications, to enable clean air for a sustainable future. We are the Emissions Professionals.

About Us

BASF's Catalysts division is the world's leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious metals, BASF's Catalysts division develops unique, proprietary catalyst and adsorbent solutions that drive customer success.

Visit www.catalysts.basf.com/patents for a list of our product patents.

BASF – We create chemistry

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