

Gasoline & Diesel Engines Ecoflex Applications



SAFFIL
Automotive

Close Coupled Catalysts

Ecoflex substrate support systems have:

- excellent high temperature durability properties and are designed to withstand higher operating temperatures (>1100°C)
- Increased vibration forces as converters move closer to the engine.

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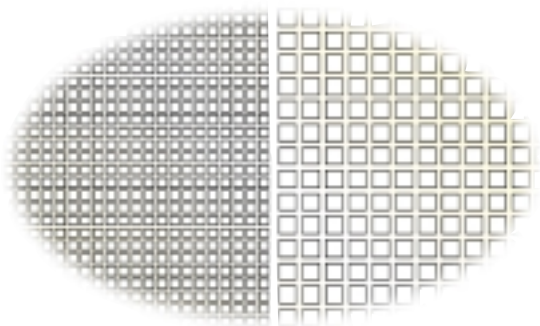
- unique thermal conductivity properties, and have been designed to meet cold face temperature demands and prevent against thermal shock in critical application phases, for faster light-off and where package size is critical.

Ecoflex substrate support systems:

- retain mat integrity in close coupled applications, and have a high fibre resiliency to cope with the mechanical and thermal stresses involved.

Thin & Ultra Thin Wall Substrates

- Increased geometric surface area which increases catalyst efficiency
- Increased efficiency facilitates reduced usage of precious metal catalysts
- Faster light off due to lower converter thermal mass
- Equivalent emissions performance can be achieved in a smaller package, where space is critical
- Potential pressure drop reduction to increase power or reduce fuel consumption.



Examples of different wall thickness and cell density configurations

Gasoline Engines

Ecoflex substrate support systems are particularly suited to modern close coupled converter applications.

Over 80% of exhaust emissions occurs during the first two minute warm up phase of any engine. Positioning the catalyst close to the engine reduces the thermal losses from the gas stream enabling a faster light-off of the catalyst and a significant reduction in exhaust gas emission levels.

The Internal temperature of the substrate is critical and conversion efficiency is limited until the temperature at which the catalyst will generate it's own heat through an exothermic reaction is reached.

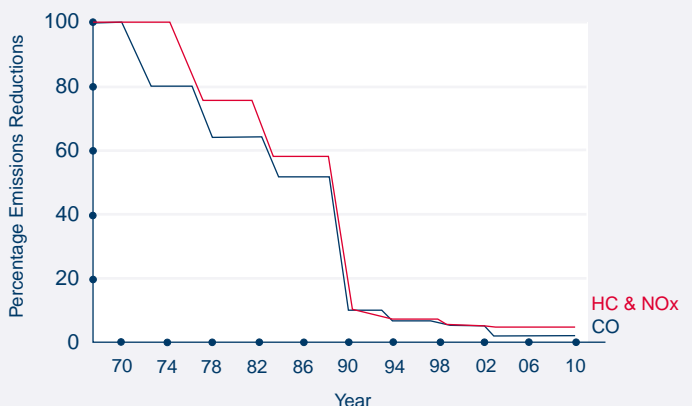
Ecoflex mats have a low thermal conductivity which has an insulating effect keeping the heat within the substrate.

Thin & Ultra Thin Wall Substrates

Thin (4mils) and Ultra Thin (2-3mils) Wall Technology is used to increase the catalyst efficiency during operation through a greater geometric surface area (GSA), and during start up due to a lower thermal mass, enabling the converter to reach operation temperature faster.

Ecoflex mats have been specially designed for use in soft canning systems and do not damage the substrate during canning or operation.

Evolution of Gaseous Emission Regulations for Gasoline Engines



Supporting Performance Advantage

Diesel Engines

All new diesel engines sold are now fitted with oxidation catalysts.

Diesel Oxidation Catalysts

Diesel oxidation catalysts lower particulate mass by up to 50%, by destruction of the organic fraction of the particulate, as well as making significant reductions in CO, HC and the characteristic diesel odour. Ecoflex products have been especially designed for supporting diesel converters and do not require costly pre-treatment to activate booster particles to ensure the substrate will not slip.

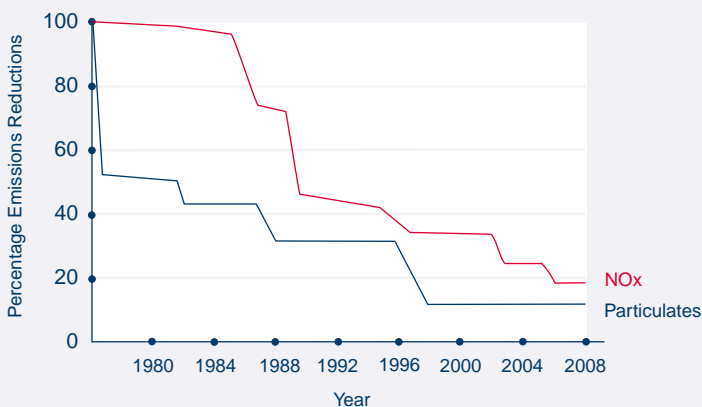
Diesel Particulate Filters

Diesel engines offer better fuel economy, long-term durability and lower gas emissions than gasoline engines. However, there are concerns about the environmental and health hazards posed especially by diesel exhaust emissions.

Emission regulations require a reduction in both harmful gases and fine particulate from the engine. A Diesel Particulate Filter (DPF) reduces the particulate mass capturing the ultra fine particles in the exhaust gas stream.

DPF applications are different from catalytic converter systems as the gas stream passes through the porous walls of the substrate as opposed to flowing through the channels. Thus the back pressures on the system are much higher. DPF substrates are also heavier than catalytic converter substrates thus requiring different mat holding properties. Ecoflex series mats have been designed to meet the demands of DPF applications where holding force and laminar shear properties are critical.

Evolution of Gaseous Emission Regulations for Diesel Engines



Diesel Oxidation Catalysts (DOC)

Ecoflex substrate support systems are fibre based products and have a constant holding force with temperature. This feature means diesel converters do not need to be pre-treated to expand the mat.

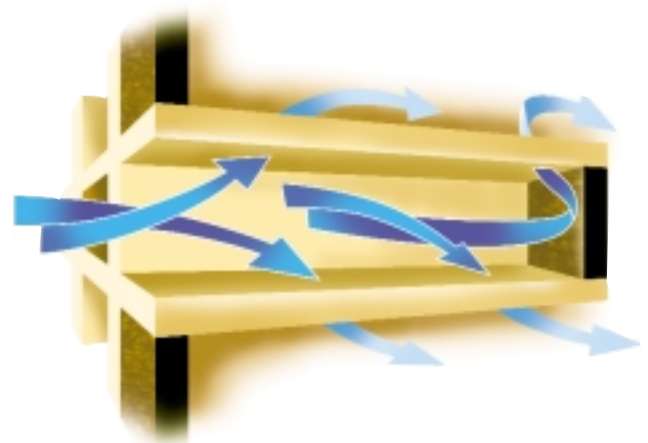
Ecoflex substrate support systems retain mat integrity to withstand the thermal and mechanical stresses of diesel operation.

Ecoflex products have a unique binder system which retains performance during organic burn out and diesel operation phase.

Diesel Particulate Filters (DPF)

Ecoflex have developed a support system with the needs of DPF parameters in mind. The Ecoflex fibre systems have a high holding pressure and shear strength to prevent substrate slippage created by the increased monolith weight and back pressure.

Ecoflex products are designed to be used at DPF operating temperatures. However, they retain the alumina fibre thermal properties and mechanical resiliency to cope with both regeneration temperature peaks and outer shell expansion in Diesel Particulate Filter applications.



Wall Flow principle in a Diesel Particulate Filter

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