

## Innovation: Exhaust Gas Aftertreatment Concept for Diesel Engines

### Gesellschaft für Emissionstechnologie mbH

Hauptstraße 128  
D-53797 Lohmar  
Telephone +49 2246 109 - 0  
Telefax +49 2246 109-109

### USA:

3250 University Drive, Suite 100  
Auburn Hills, Michigan 48326-2390  
Telephone +1 248 276-6430  
Telefax +1 248 276-6431

### Japan:

Sumitomo Seimei Shin-Osaka  
Higashiguchi Bldg. 8F,  
1-19-4, Higashi-Nakajima,  
Higashi-Yodogawa-ku  
Osaka 533-0033  
Telephone +81 6 6325-0931/0941/0981  
Telefax +81 6 6325-0996

Sigma Bldg. 1F,  
3-7-12, Shibaura, Minato-ku, Tokyo 108-0023  
Telephone +81 3 5476-5901  
Telefax +81 3 5476-5906

### India:

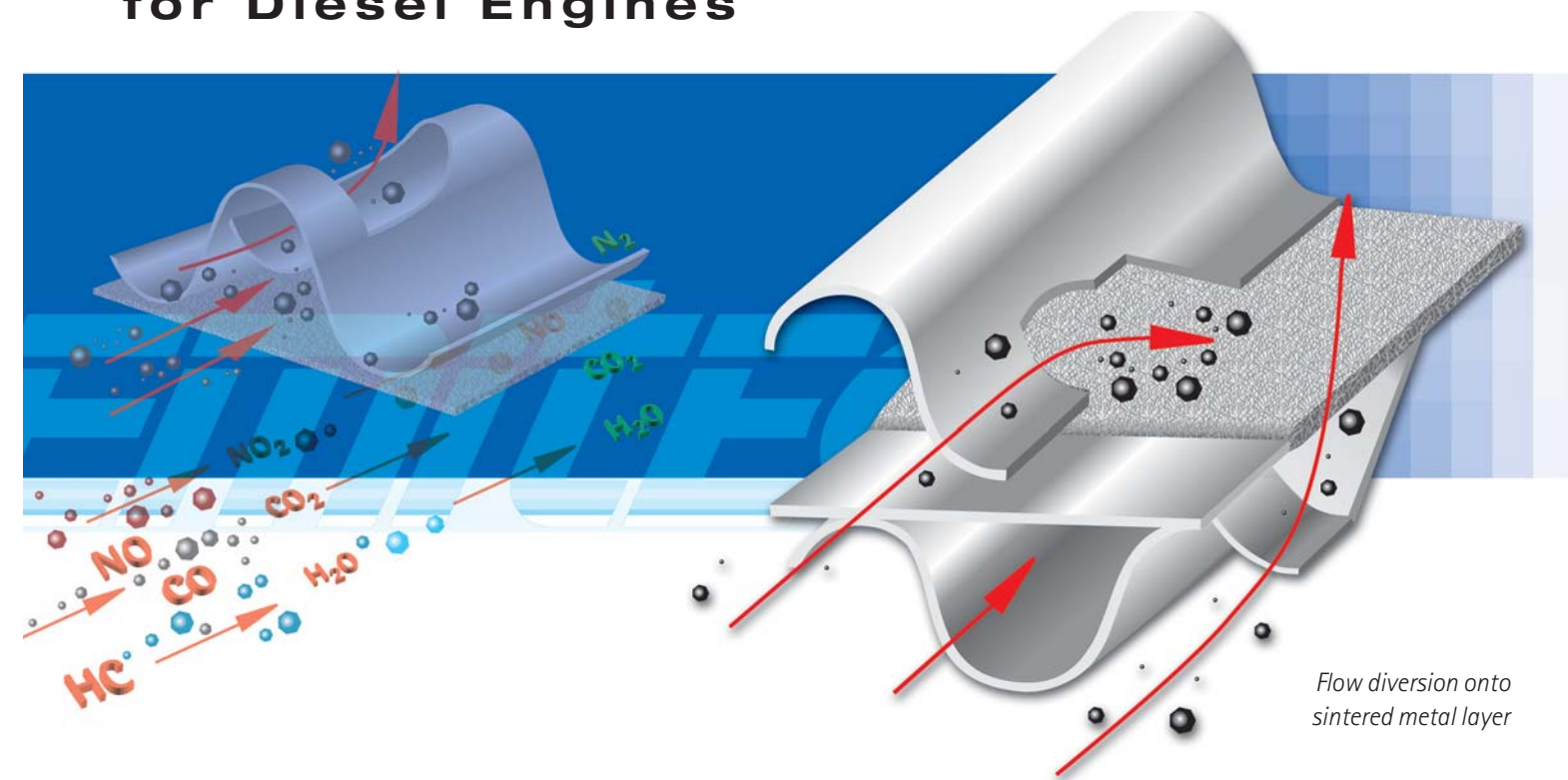
Emitec Emission Controls Pvt. Ltd.  
Office #503, 5th Floor  
413-B, EDEN HALL  
Gokhale Road,  
Shivaji Nagar  
Pune 411 016  
Telephone +91 20 5671635  
Telefax +91 20 5671635

### China:

Emitec Gesellschaft für Emissionstechnologie mbH  
Beijing Representative Office: Beijing Office No. 3  
Mai Zi Dian Xi Road, Chao Yang District, Beijing P.R. China  
Beijing Towercrest Plaza, Room 919  
Post code: 100016  
Telephone +86 10 64674354  
Telefax +86 10 64674261

### South Korea:

Korean Emitec Representative Office:  
Korea Techcon Co. Ltd.  
Yeosan Building, Room 501  
668-4 Yeoksam-dong  
Kangnam-Ku  
135-010 Seoul  
Telephone +82 2 5019091  
Telefax +82 2 5019093

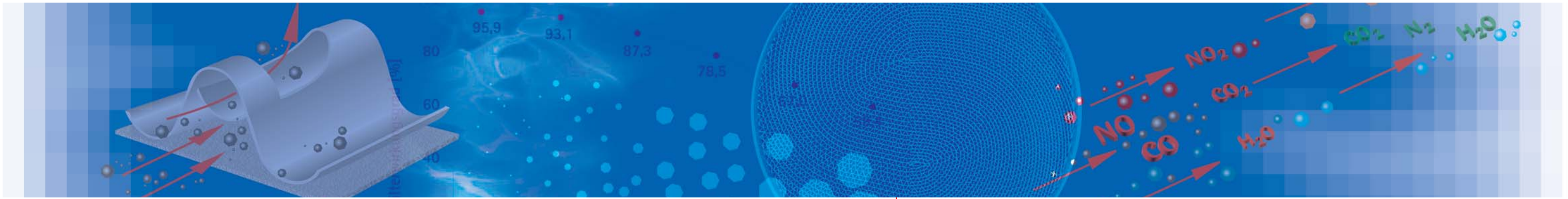


Flow diversion onto  
sintered metal layer

### The PM-Filter Catalyst

The levels of soot particles in diesel exhaust gas have to be reduced to low limit values for the exhaust gas levels EU IV, EU V and EPA 07. For the purpose of reducing these particle levels, especially in the nano-range, Emitec has developed the PM-Filter Catalyst (PM = Particulate Matter).

**EMITEC**



## Innovation in exhaust gas aftertreatment concepts

### Open channel structures cannot become blocked

In contrast to other closed filter systems the PM-Filter Catalysts works using open channel structures. This guarantees fault-free engine operation even in cases where regeneration is lacking. Separated particles are reduced in a system of continual reaction with  $\text{NO}_2$  from the upstream oxidation catalysts.

In contrast to closed filter systems, the PM-Filter Catalyst works using open channel structures.

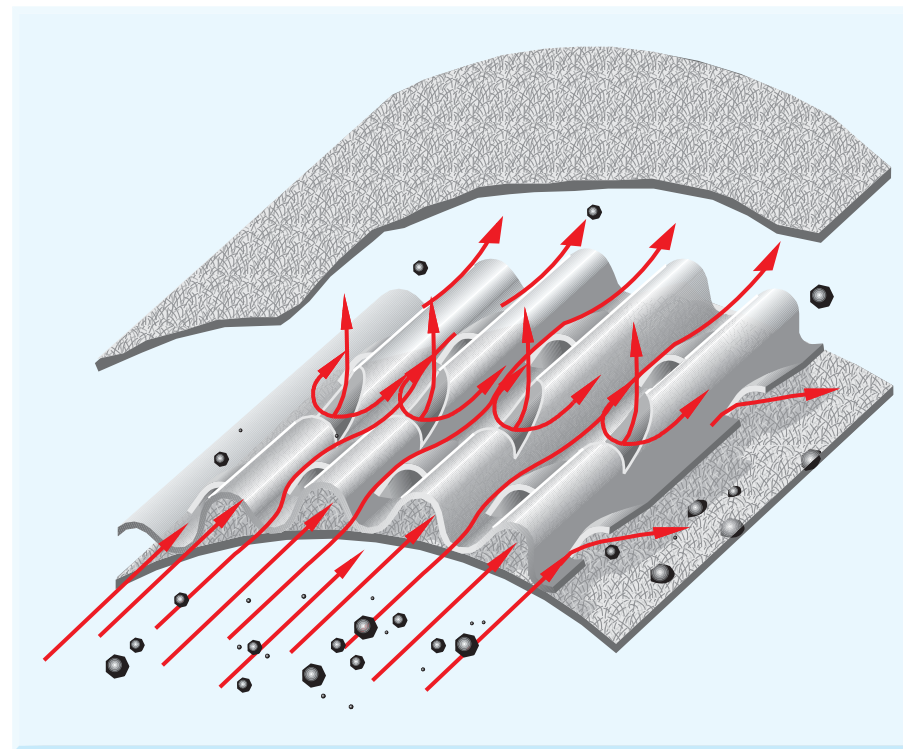


Diagram 1: Operating principle of the open filter concept; Flow and particles diverted onto the sintered metal layer.

### Continous particle reduction

The new particle separator steers the flow of exhaust gas into various channels.

The particles are trapped in a fleece, where they are stored intermediately and continuously burned at a temperature of around 200 °C.

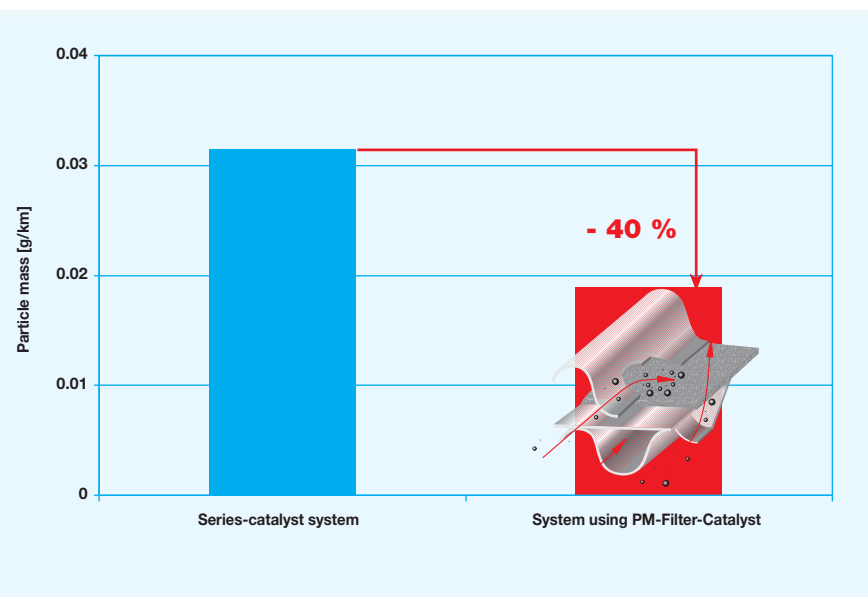


Diagram 2: Particle reduction in the MVEG-Test using the PM-Filter Catalyst

## Success through Innovation

### Steps toward an optimum overall concept

The PM-Filter Catalyst is a further step forward in the overall concept of exhaust gas aftertreatment for diesel engines. This is now comprised of the Pre-Turbo Catalyst to oxidise CO and HC, a Hybrid-Catalyst to oxidize NO and a downstream open PM-Filter Catalyst. The particle filter can only function effectively in an optimally tuned overall concept. Here it is first necessary to reduce the HC and CO emissions. Only then can the NO be oxidised to  $\text{NO}_2$ .

The PM-Filter Catalyst is a further step forward in the overall concept of exhaust gas aftertreatment for diesel engines.

### Objectives

The next developmental step is to be a combination catalyst system which functions as an oxidation-catalyst converting the harmful diesel exhaust fumes CO, HC and NO and at the same time as a PM-filter catalyst drastically reducing soot particles. This innovative development is possible due to its multi-functional design concept. It is a PM-Filter, improves mass transfer, gas mixture and evens out flow.

For further information contact EMITEC.

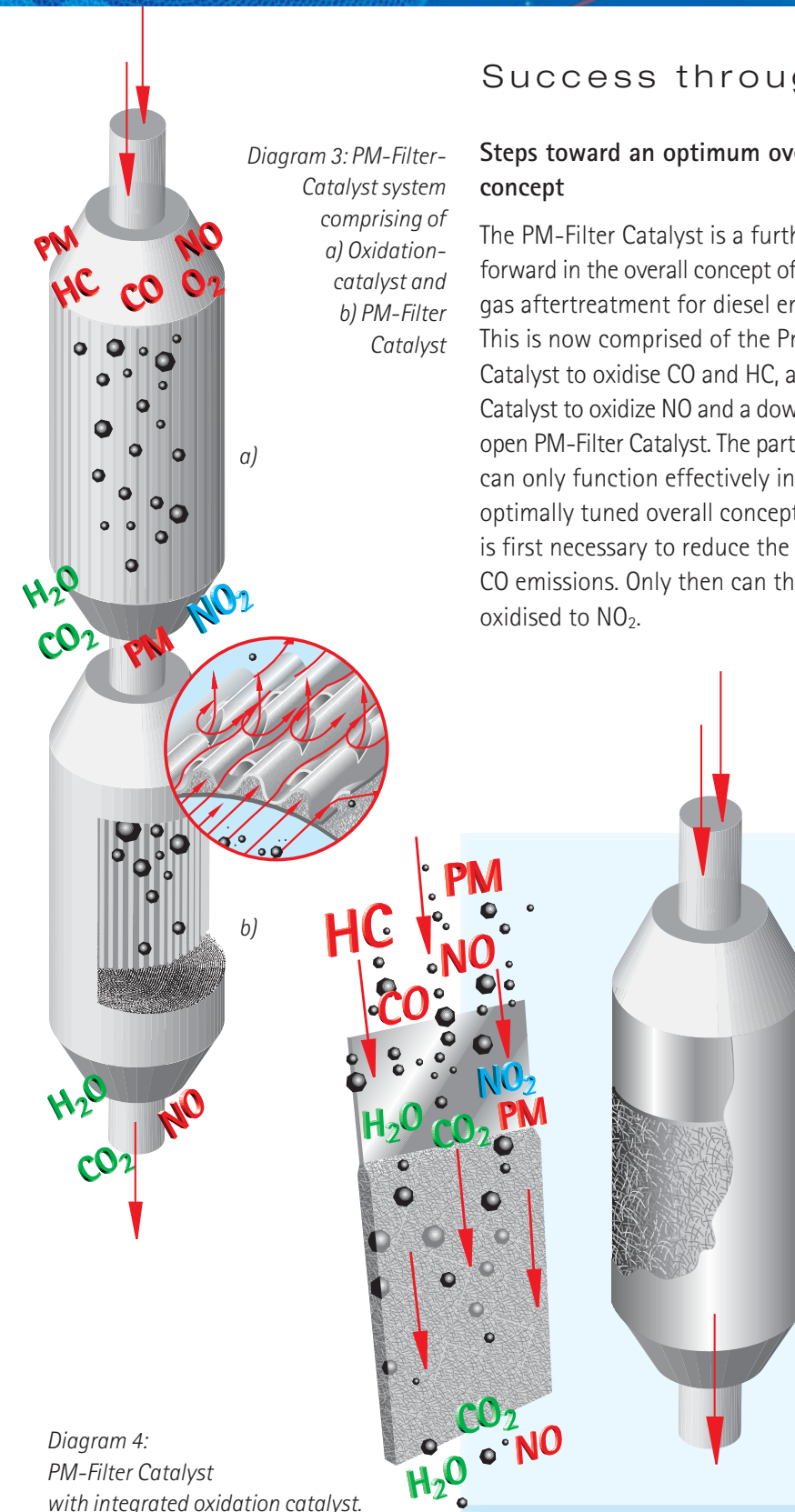


Diagram 3: PM-Filter-Catalyst system comprising of a) Oxidation-catalyst and b) PM-Filter Catalyst

Diagram 4: PM-Filter Catalyst with integrated oxidation catalyst.