

 We care for air.

Diesel particulate filters with active regeneration in mining




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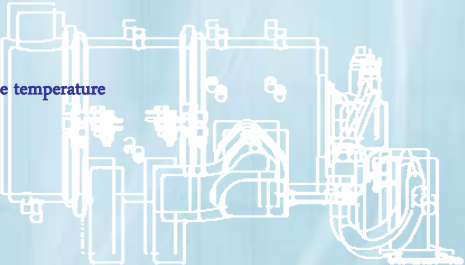
Presented by Hans-Jörg Rembor
MDEC 2007


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Contents of the presentation - overview

-  Company profile – facts in a nutshell
-  Active or passive DPFs – depending on the temperature
-  Active DPF application in mining
-  Passive DPF application in mining
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Company profile – facts in a nutshell

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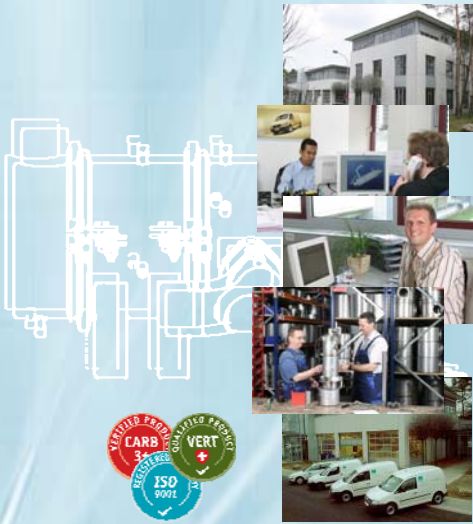


The HUSS Umwelttechnik in Germany is developer, producer and seller of diesel particulate filter systems for construction machines, fork-lift trucks, municipal and commercial vehicles, buses and stationary power engines up to 500 kW.

Our systems are specified either for retrofit and OEM applications.

We are focussing international markets with an emphasis on Europe.

The HUSS products are successfully established on the market since 1985. The customer benefits of more than 20 years of experience.


We are certified by VERT, CARB, 3CV, TRGS554, TALuft, Technologisk Institut, DIN Iso, TÜV approval.

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Company profile – facts in a nutshell

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HUSS, LLC
Palm Springs, CA
Sales, Service, Logistics

HUSS, LLC
New York, NY
Sales, Service

HUSS Umwelttechnik GmbH
Bremen, Germany
Sales, Service, Logistics

HUSS Umwelttechnik GmbH
Dresden, Germany
Production, Line of SIC-Filter

HUSS Umwelttechnik GmbH
Nuremberg, Germany
Headquarter, Administration, R&D, Sales, Service, Logistics



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Two functions describe a filter system:
Filtering and Regenerating

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Functions of a DPF filter system:

„Filtering“
or „how to catch the particles“


Filter efficiency of the filter medium

wall-flow filtering and **non wall-filtering** methods as well as different filter mediums e.g. like SiC, Cordierit, Sinter Metal make the difference

„Regenerating“
or „how to get rid of the particles“

Active Regeneration:
In order to burn the soot the igniting temperature of 550°C is reached by adding thermal energy e.g. by diesel burner or electric heating

Passive Regeneration:
In order to burn the soot, the igniting temperature of 550°C is reduced e.g. by adding additives to the fuel or using an oxidation catalyst

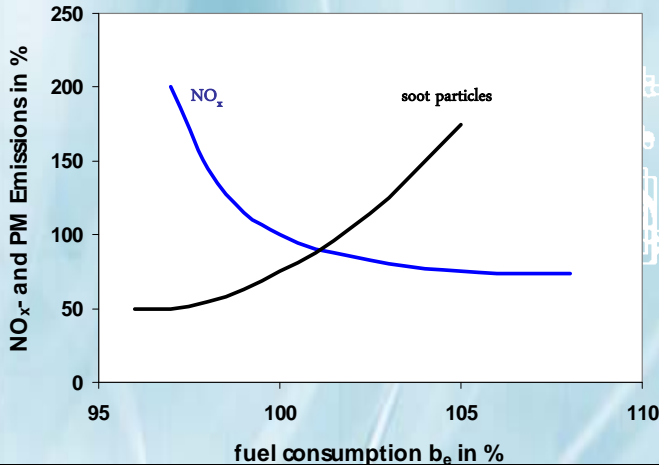


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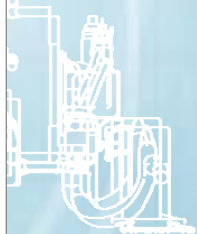
Particulate matter – risks and dangers:
The trade-off between NO_x and PM

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The burning temperature of fuel where the NO emissions (NO, NO₂, NO_x) are low, leads to high emissions of soot – and vice versa.



Fuel consumption b_0 in %	NO _x Emissions in %	soot particles Emissions in %
95	~200	~50
100	~100	~80
105	~80	~150
110	~75	~180




Source: Forschungsinstitut Fahrzeugtechnik/ HTW Dresden, FAD-Konferenz 2003








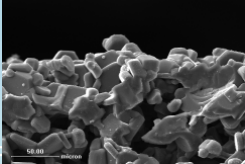



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**Product range – a solution for every application:
Silicon Carbide (SiC)
– don't settle for something worse**




Material Attributes of SiC:

-  high thermal resistance
-  high chemical resistance
-  high mechanical durability
-  high filter efficiency
-  low back-pressure attitude

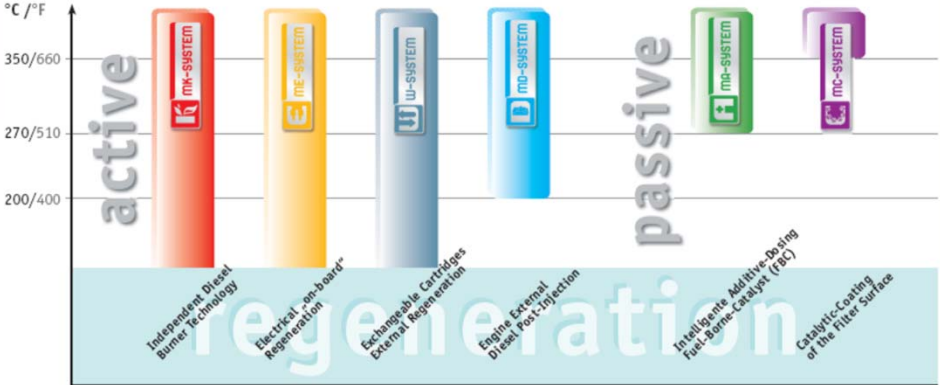





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Product range – for every application a solution that fits!



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active


- K** mk-SYSTEM: Independent Diesel Burner Technology
- E** me-SYSTEM: Electrical "on-board" Regeneration
- U** uw-SYSTEM: Exchangeable Cartridges
- D** md-SYSTEM: Engine External Diesel Post-Injection

passive

- f** fm-SYSTEM: Intelligent Additive-Dosing Fuel-borne-Catalyst (FBC)
- mc** mc-SYSTEM: Catalyst-Coating of the filter Surface

regeneration

*all HUSS products are modular designed, made of stainless steel, use a SiC high performance ceramic filter, and have a filtration efficiency of 99%



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Exhaust gas temperatures – a specific criteria for construction machines and municipal vehicles

The records of the Data-Logger are showing the temperatures

Example of a „normal“ working „cold“ machine: in 94% of the time below 250°C

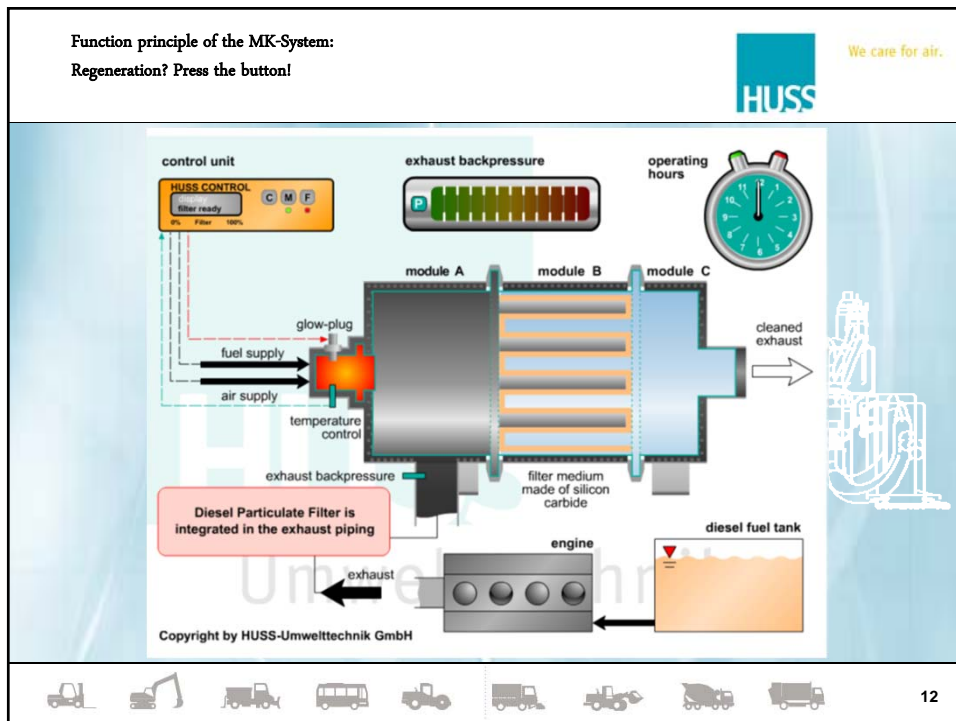
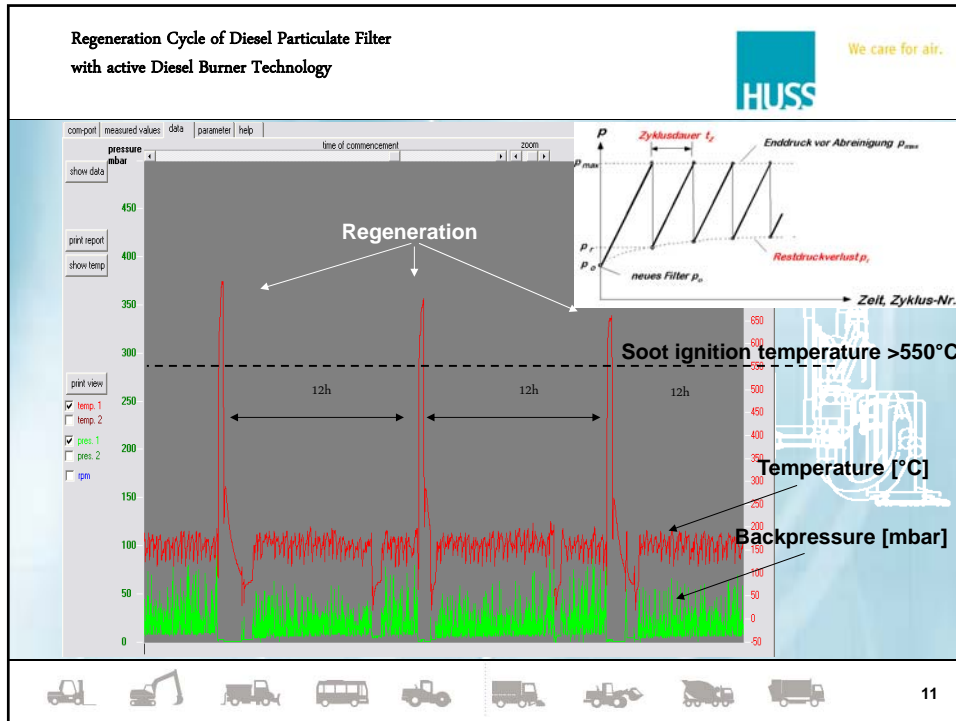
Example of a „hard“ working „cold“ machine: still in 54% of the time below 250°C

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Examples for DPF in Mining

Caterpillar 980C wheel loader with diesel burner DPF

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Examples for DPF in Mining



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GHH LF 41 wheel loader with diesel burner DPF



Examples for DPF in Mining





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GHH dumper with rechargeable DPF



**Regeneration cycle of an Particulate Filter
with Additive Technology (FBC)**

Due to optimized dosing of additive the back pressure is limited in the spectrum between 60 mbar and 90 mbar.




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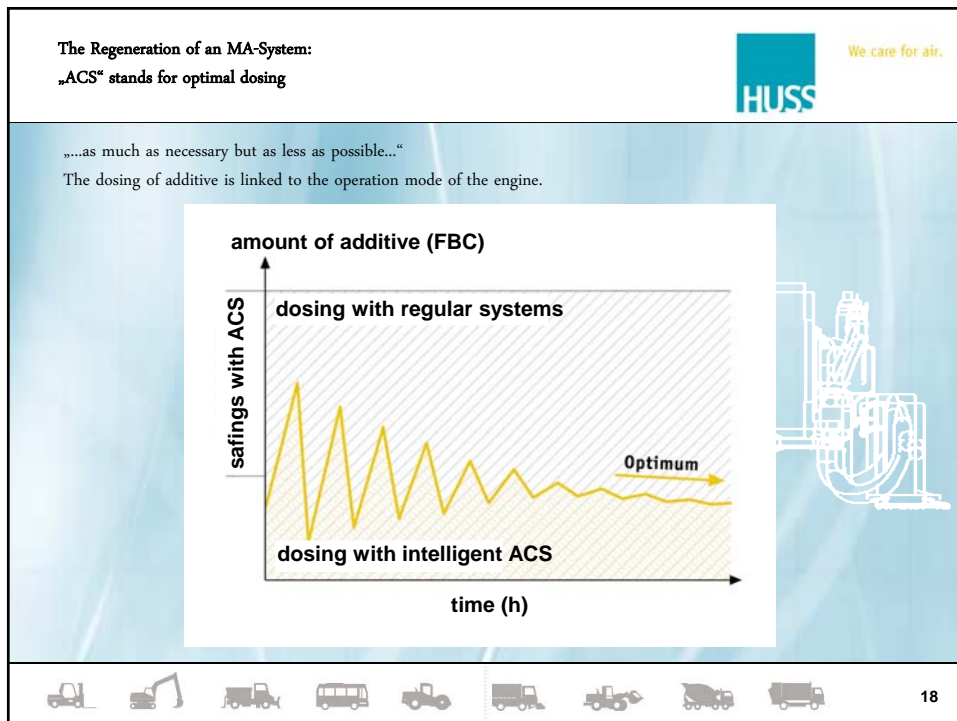
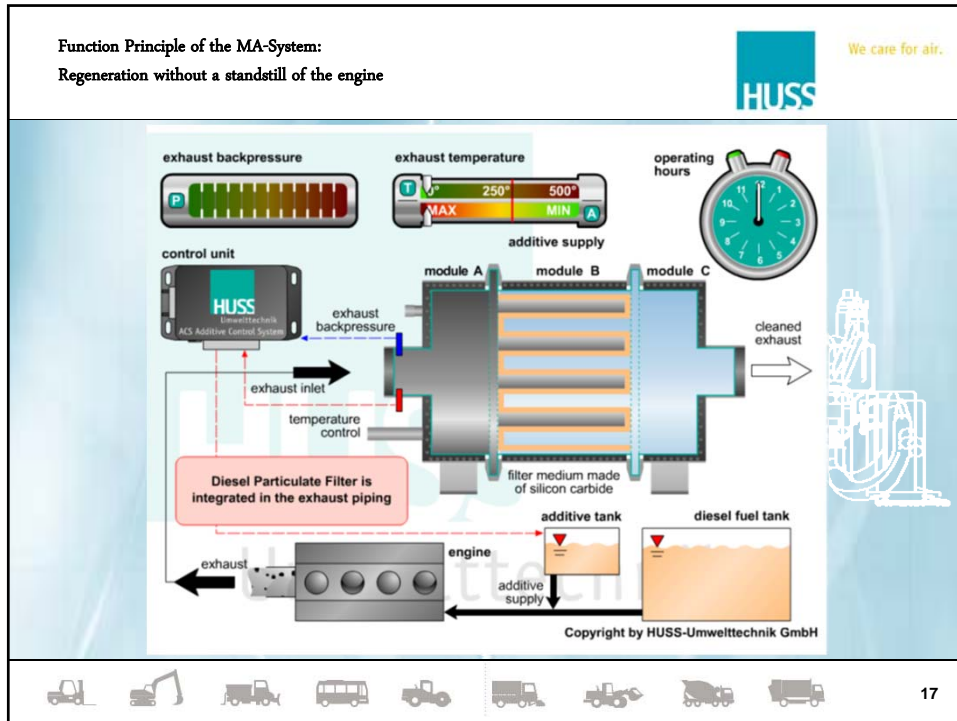
Examples for DPF in Mining




KramerAllrad 318 wheel loader with active DPF in vertical position


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References: Thousands of filter systems in „on“- and „off-road“ applications



Logo: **HUSS** We care for air.



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References: Fork Lift Trucks
Clever Installation inside the counter-weight



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References: Fork Lift Trucks
Fresh air even for a 45 t Fork Lifter


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References: Construction Machines
From Loader to Crawler

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References: Construction Machines
From Dumper to Telescopic Lifter

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This slide features a light blue background with a white line-art graphic of a construction machine on the right side. At the top left, the text reads 'References: Construction Machines' and 'From Dumper to Telescopic Lifter'. The top right corner contains the 'HUSS' logo and the slogan 'We care for air.'. The main content area is a collage of four photographs: a green SENEBOG dumper, a red MAHI telescopic lifter, a white ZSCHOKKE LOCHER dumper, and a white HUSS dumper. At the bottom, there is a row of ten small icons representing various types of construction vehicles, and the number '23' is positioned at the bottom right.

References: Municipal Vehicles
Clean Cities without soot

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24

This slide features a light blue background with a white line-art graphic of a construction machine on the right side. At the top left, the text reads 'References: Municipal Vehicles' and 'Clean Cities without soot'. The top right corner contains the 'HUSS' logo and the slogan 'We care for air.'. The main content area is a collage of four photographs: a yellow and white waste truck, an orange waste truck, an orange HUSS dumper, and an orange HUSS dumper. At the bottom, there is a row of ten small icons representing various types of construction vehicles, and the number '24' is positioned at the bottom right.

References: Public Transportation
Proper Transportation

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