### 11<sup>th</sup> ETH Conference on Combustion Generated Nanoparticles

The Swiss Federal Office for the Environment is Patron of this Conference Zurich, 13<sup>th</sup> - 15<sup>th</sup> August 2007

### Conference Venue: Zürich ETH Zentrum, Main Building, Room HG E7

Welcome-Party Sunday 7.00 pm – 10.00 pm, ETH Zentrum, Cafeteria Polyterrasse Conference Registration Monday 8.00 am see <u>www.nanoparticles.ethz.ch</u>

## **Agenda of Presentations**

Welcome and Key-Lectures

Monday 13<sup>th</sup> August - 09.00

Burtscher H./ FHNW, Switzerland

Welcome !

Kasper M. / Matter Engineering, Switzerland

Housekeeping Announcements

Cerny Th./ Swiss Cancer League, Kantonsspital St.Gallen

Combustion Particles and Preventive Measures against Cancer

De Santi G./ European Commission DG-JRC, Italy

Particle Emissions from Vehicles: EU Policy Development and Contribution of Research

Konstandopoulos A./ Center for Research and Technology Hellas, Greece

Transport and Reaction Phenomena in Diesel Particulate Filters

#### Session 1A: Fundamentals (1)

Chairman: C.-D. Schegk

Davoodi P. / University of Karlsruhe, Germany Catalytic Oxidation of Carbon Aerosols: Influence of the Pt-C Interparticle Contact on the Kinetic Parameters ( $E_a$  and  $k_0$ )

Kureti S. / University of Karlsruhe, Germany Mechanism of the Catalytic Soot Oxidation on Fe2O3

### COFFEE BREAK

# Session 1B: Fundamentals (2)

Chairman: C.-D. Schegk

Goto Y. / NTSEL, Tokyo

Composition Analysis of Fine Particles from Diesel Vehicles using PIXE

Duplissy J. / PSI Villigen, Switzerland

Influence of Photooxidation and Oligomerisation on the Hygroscopicity and Volatility of 1, 3,5-Trimethylbenzene SOA

Pratsinis S.E. / ETHZ, Switzerland

Agglomerate Dynamics at High Concentrations

Rossi M. / EPFL Lausanne, Switzerland

The Reaction of Flame Soot with Nitrogen Oxides (NO<sub>2</sub>, NO<sub>3</sub>, N<sub>2</sub>O<sub>5</sub>, HONO, HNO<sub>3</sub>): a brief Overview of the Chemistry

1

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11.00 - 11.30

10.20 - 11.00

Session 2: Emissions Onroad and Nonroad	
Chairman: K. Boulouchos	14.00 - 15.40
Astorga-Lloréns M.C. / European Commission DG-JRC, Italy Effect of Biodiesel Fuels on Emissions from EURO 4 Passenger Cars	
Gautam M. / West Virginia University, USA Growth of Diesel Exhaust Particulate Matter in a Ventilated Mine Tunnel	
Hagen D. / University of Missouri-Rolla, USA An Advected Plume Study of Commercial Aircraft Take-off PM Emissions	
Lauer P. / MAN, Germany Internal Reduction and in Service Measurements of PM from large 4-Strok	e Diesel Engines
Kirchen P. / ETHZ, Switzerland Measurement of the Instantaneous In-Cylinder Soot Concentrations and T Multi-Cylinder Diesel Engine	emperatures in a

#### **POSTER SESSION**

#### and COFFEE BREAK

15.40 - 17.00

18.45

19.30

Session 3: Instrumentation	
Chairman: H. Burtscher	17.00 - 18.45
Hauser G. / University Wolfenbüttel, Germany Smoke Particle Sensors for OBD and High Sensitive Measurements	
Horn H.G. / TSI, Germany Tail-Pipe Measurements of Emissions from LD Vehicles with Diesel Engine parison of Five Different Measurement Methods	es: A Direct Com-
Mamakos A. / Aristotle University, Greece A Revised Data Inversion Algorithm for the Dekati's Mass Monitor	
Reavell K.St.J. / Cambustion, UK Calibration of Fast Electrical Mobility Spectrometers for Engine Particulate	Measurement
Sakurai H. / AIST, Japan Primary Standard for Aerosol Particle Number Concentration	

#### APERO

DINNER PARTY invited by Sponsors

### Dinner-Speaker: Dr. Rudolf Kasper / USM - frequent participant

### Tuesday 14<sup>th</sup> August 2007

#### Session 4A: Health Effects (1)

Chairman: P. Gehr

Kuenzli N. / ICREA, Spain

Traffic Related Pollution: Risk Factor for the Development of Cardiovascular Diseases?

Gerlofs-Nijland M.E. / RIVM Bilthoven, The Netherlands Multi-Centre Health Effect Studies on Inhaled Combustion Derived (Nano)Particles in Rats and Humans

Wenger D. / EMPA, Switzerland

Secondary Effects of Catalytic Diesel Particulate Filters: Reduced Emissions of Potential Endocrine Disruptors

McDonald J.D. / LRRI, USA

Contributions of Carbonaceous (Nano) Particulate and Non-Particulate Components to Health Hazards of Engine Emissions

#### COFFEE BREAK

Chairman: P. Gehr

Limbach L.K. / ETHZ, Switzerland Exposure of Engineered Nanoparticles to Human Lung Epithelial Cells: Influence of Chemical Composition and Catalytic Activity on Oxidative Stress

Setyan A. / EPFL Lausanne, Switzerland

Assessment of Particulate Exposure and Surface Characteristics in Association with Urinary Levels of Oxidative Stress Biomarkers

Stoeger T. / GSF Neuherberg, Germany

Differentiation between Sources of Particle-induced Oxidative Stress:

Surface Area Versus Organic Compounds

Kasper M. / Matter Engineering, Switzerland

PM10-TEQ - Approach to a Health-Oriented Descriptor of Particulate Air Pollution

#### Panel Discussion on Health Effects

moderated by P.Gehr

LUNCH

12.45 - 14.00

08.30 - 10.10

10.10 - 10.40

10.40 - 12.00

12.00 - 12.45

Session 5A: Particle Reduction by Aftertreatment (1)	14.00 - 15.50
Chairman: D. Kittelson	
Kohli J. / Corning, USA Diesel Particulate Control Technology in Review	Key-Lecture
Bugarski A. / NIOSH, USA Characterization of the Physical and Chemical Properties of Diesel Aerosc ground Mine Laboratory	ols in an Under-
Heeb N. / EMPA, Switzerland Secondary Effects of Catalytic Diesel Particulate Filters: Assessment of the tion Potential	e PCDD/F Forma-
Hohl Y. / ETHZ, Switzerland Heavy Duty Vehicle Emissions Retrofit Kit	
Khair M. / SWRI, USA Beijing Pilot Retrofit - Real World PM Reduction from Three Retrofit Techn	nologies
POSTER SESSION	

#### and COFFEE BREAK

Session 5B: Particle Reduction by Aftertreatment (2)	16.50 - 18.30
Chairman: M. Mohr	
Vojtisek-Lom M. / Uni Liberec, Czech Republic Real-time, on-road Measurements of Diesel Exhaust Aftertreatment Device Efficiency	PM Removal
Lehtoranta K. / ECOCAT, Finland Reducing Diesel Particle Emissions by Particle Oxidation Catalyst	
Kittelson D. / University of Minnesota, USA Effect of Fuel and Lube Oil Sulfur on the Performance of a Diesel Exhaust Regenerating Trap	Gas Continuously
Bosteels D. / AECC, Belgium Application of the PMP Methodology to Measure the Particle Number and F Emissions of a Heavy-Duty Engine	Particulate Mass
Zuberi B./ GEO2 Technologies Inc., USA Advanced High Porosity Ceramic Honeycomb Wall Flow Filters	

### **APERO - Invited by Exhibitors**

18.30

15.50 - 16.50

## Wednesday, 15<sup>th</sup> August 2007

#### Session 6: Legislation 08.30 - 10.20 Chairman: G. D'Urbano Sadler L. / Sadler Consultants, Germany Key-Lecture Policies driving the Use of Diesel Particle Filters in Europe Ayala A. / CARB, USA A California Assessment of PMP for Determination of Diesel Particle Emissions Barrios C. / Conama, Chile Emission Standard Setting Process for Stationary Generators in Chile Giechaskiel B. / European Commission DG-JRC, Italy Particle Measurement Program (PMP) Light Duty Inter-Laboratory Exercise: Final Results Zaw-Mon M. and Guy J, / EPA, USA Update on The US Diesel Retrofit Program

#### **COFFEE BREAK**

Session 7: Ambient Air and Climate	10.50 - 12.30
Chairman: R. Gehrig	
Arnold F. / MPI Heidelberg, Germany Combustion Generated Gaseous Nanoparticle Precursors in the Pollute mosphere at Altitudes between 0 and 13 km: Atmospheric Nanoparticle	ed and Remote At- Formation
Prévôt A. / PSI Villigen, Switzerland Overview of the Particulate Matter Composition in Various Regions of S	witzerland
Lanz V. / EMPA, Switzerland Source Apportionment of Submicron Organic Aerosols at an Urban Bac Zürich, Switzerland	kground Site in
Braun A. / EMPA, Switzerland Carbon Functional Groups Identification and Source Apportionment of I ter	Fine Particulate Mat-
Weingartner E. / PSI Villigen, Switzerland Impact of Black Carbon on Climate: Interaction of Soot Containing Parti	cles with Clouds

Zanon, Omizonana	
Braun A. / EMPA, Switzerland	
Carbon Functional Groups Identification and Source Apportionment of Fine	Particulate
ter	
Weingartner E. / PSI Villigen, Switzerland	
Impact of Black Carbon on Climate: Interaction of Soot Containing Particles	with Cloud
Closing Remarks: Prof. Dr. K. Boulouchos	12.30
-	

Lunch

12.40

15.08.2007

10.20 - 10.50

#### Focus-Event (German Language):

#### Feinstaub in urbaner Luft (1)

Einführung und Moderation: P. Straehl

Rapp R. / Universität Basel

Gesundheitliche Aspekte von Feinstaub-Belastungen: Neue Resultate

Brunner J. / Umwelt und Gesundheitsschutz Zürich

Partikelimmissionen in der Stadt Zürich Imhof D./Switzerland

Potenziale der Nachrüstung von Partikelfiltersystemen in Zürich

### Kaffee – Pause

Focus-Event (German Language):

Feinstaub in urbaner Luft (2)

Nussbaumer T. / Verenum Beitrag der Holzfeuerungen zur Feinstaub-Belastung: Arten von Feinstaub, gesundheitliche Aspekte, Hochrechnungen und Minderungspotenzial

Bisig R. / Landwirtschaftsamt Kanton Zug

Förderung der Partikelfilter bei schweren landwirtschaftlichen Fahrzeugen

Minger J. / BAFU

Prioritäten der Bundesbehörden, Umsetzung Aktionsplan zur Partikelminimierung

### Ende der Gesamt-Veranstaltung



15.08.2007

14.00 - 15.40

16.00 - 17.15

15.40 - 16.00

17.15

# **POSTERS (Foyer Eo and E South)**

1.	Andersson J.	PMP Light-duty Inter-lab Exercise: Interesting Observations and Lessons Learned
2.	Asano I.	Solid particle penetration calibration for VPR in the SPCS
3.	Ayala A.	Nanoparticles from a California In-use Heavy Duty Diesel Truck Equipped with PM-NOx Retrofits
4.	Bergamin N.	"Emergency Regeneration" of DPF with glycol
5.	Bernemyr H.	Number Measurements and Size Dependent Volatility Study of Diesel Exhaust Particles
6.	Braun A.	Formation of Solid Intermediate Films on Spherical Particles
7.	Braun A.	Application of small Angle and wide Angle X-ray scattering for the Characterization of Carbonaceous Materials, Aero- sols, and Particles
8.	Büchel R.	Two-nozzle Flame Synthesis of Pt/Ba/Al2O3 for NOx storage
9.	Burtscher H.	Nanoparticle Filtration for Vehicle Cabins
10.	Chirico R.	PC Rhine Valley: Spatial Gradients of Particle Composition in the Rhine Valley
11.	Czerwinski J.	Particle Emission Reduction of 2-S Scooters with different technical measures
12.	Czerwinski J.	Catalyst Ageing and Particle Emissions of 2-S Scooters
13.	Czerwinski J.	(Nano) Particles Filtration of PM-Catalysts
14.	Czerwinski J.	VERT dPN - a Quality Verification Procedure for Combined Diesel Aftertreatment Systems DPF + SCR
15.	Dreher W.	Identification of Traffic-Related PM10 Sources at a High Traf- fic Site in Stuttgart, Germany
16.	Erich E.	Reduction of Soot Emissions from Small Scale Furnaces
17.	Fierz M.	An improved thermodenuder design
18.	Fierz M.	Theoretical and Experimental Evaluation of a Portable TEM Sampler
19.	Furger M.	Determination of Trace Elements in Ambient Aerosols by Synchrotron XRF
20.	Gäggeler K.	Online IC-MS measurements of organic acids in aerosols and the gas phase in Roveredo
21.	Herich H.	Aerosol Chemical Composition and Hygroscopic Growth - First Results from Field Studies.
22.	Hohl Y.	Heavy Duty Vehicle Emissions Retrofit Kit
23.	Imhof D.	The Benefit of Particle Filter Systems for Improving Kerbside Air Quality
24.	Isella L.	Particle Transport and Dynamics in a Full Dilution Tunnel of Diesel Vehicle Emissions

25.	Kammermann L.	Hygroscopic Growth and Chemical Composition: First Results from Combined Measurements with an HTDMA and an ATOFMS
26.	Kasper M.	Conformity of Production Testing for Particle Traps - a Model Experiment
27.	Kasper R.	FAP after 110'000 Kilometers - a Case Study
28.	Kindler Ph.	Particle Emissions from Waterpipes
29.	Kraft M.	ModellingParticle Shape and Compsotion of Soot Particles in Laminar Premixed Flames
30.	Landis M.	Particulate Filters on Tractors
31.	Leutert G.	SNR 277205 - Swiss Rule for Testing Particle Filter Systems
32.	Mandal B.K.	Transient Modelling of Soot Formation and its Burnout in Confined Co-Flow Methane-Air Diffusion Flame
33.	Mayer A.	Properties of particle filters after long term real world operation
34.	Meyer N.	Steady State and Transient Vehicle Emissions Measured Using a Diffusion Size Classifier
35.	Mühlfeld Chr.	The relative deposition index: A novel quantitative method to analyze the distributions of nanoparticles within tissues and cells - Theory and Practice
36.	Niemi S.	Effects of Injector Tips on the Exhaust Particle Size Distribu- tion of a Common-Rail Non-Road Diesel Engine
37.	Oh Kwang Chul	An Experimental Study of PM Emission Characteristics of Commercial Diesel Engine with SCR System to meet EURO-
38.	Reith J.	Features and Advantages of a new Engine Exhaust CPC (EECPC), TSI Model 3790
39.	Rothen-Rutishauser B.	Risk assessment of nanoparticle exposure at working places
40.	Rubino L.	Activities for the Development of an Official Test Method for On-board PM Measurements from Heavy-Duty Diesel Engines
41.	Sandradewi J.	Quantification of Wood Burning versus Traffic Contributions to Particulate Matter during a Winter Period in an Alpine Valley
42.	Schlatter J.	Portable Particle Counter for Engines with Diesel Particle Filter
43.	Steinle P.	Measurement of Ultra Fine Aerosols at Workplaces in Switzerland
44.	Stojicic N.	Bioreactivity of combustion generated particulate matter (diesel and flame exhaust) in bacteria and in human immune cells
45.	Swanson J.	Effect of Controlling Dilution Air Quality on Different Emissions Measurements
46.	Symonds J.P.R.	A Comparison of Real-Time on -road Diesel particulate emission with Chassis Dynamometer Measurements

47.	Ulrich A.	Identification of storage and release effects of sulphate arte- facts on diesel particle filter systems after longterm use
48.	Wahl C.	Comparison of Nanoparticle Formation caused by Leaded and Unleaded Aviation Gasoline Combustion
49.	Weimer S.	Characterisation of the Mass Spectra of Fine Particulate Mat- ter emitted from Wood Burning Emissions
50.	Zahoransky R.	Emissions and their Biological Impact of Diesel Engines Fuelled by Non-Esterified Plant Oils

## **SPONSORS**

### ETH-Conference on Combustion Generated Nanoparticles 2007

- AKPF Arbeitskreis der Partikelfilter-Hersteller, Wien
- AWEL Amt für Abfall, Wasser, Energie und Luft, Kanton Zürich
- BAUMOT Baumot AG, Fehraltdorf, Schweiz
- BFE Bundesamt für Energie, Bern
- BAFU Bundesamt für Umwelt, Bern
- CAMBUSTION Cambustion Ltd. / Cambridge
- CARB California Air Resources Board, CA, U.S.A.
- CPK Car Parts Kuhn / Münster
- DEZA Direktion für Entwicklung und Zusammenarbeit, Bern
- DINEX DINEX A/S, Middelfart, Dänemark
- EV Erdöl-Vereinigung, Zürich
- GILLET Heinrich Gillet GmbH & Co.KG, Edenkoben, Deutschland
- HORIBA Horiba Ltd, Kyoto, Japan
- HJS / DES Fahrzeugtechnik GmbH & Co, Menden, Deutschland
- HUG Hug Engineering SA, Räterschen, Schweiz
- HUSS Huss Umwelttechnik GmbH, Nürnberg
- INNOSPEC INNOSPEC Limited, Herne, Deutschland
  - JMC Johnson Matthey GmbH, Sulzbach/Taunus, Deutschland
- KREBSLIGA Krebsliga Schweiz / Bern
- LIEBHERR Liebherr Machines Bulle S.A., Schweiz
- MANN+HUMMEL Mann&Hummel GmbH, Speyer, Deutschland
- Matter Engineering Matter Engineering AG, Wohlen, Schweiz
- METAS Bundesamt für Metrologie und Akkreditierung, Bern-Wabern
- RHODIA Rhodia Electronics & Catalysis, La Rochelle, France
- SHELL Shell Deutschland, Hamburg
- TSI TSI GmbH, Particle Instruments, Aachen, Deutschland
- UGZ

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Umwelt- und Gesundheitsschutz der Stadt Zürich

## INDEX OF EXHIBITORS (Foyer D South)

hugengineering.	Since 1983 Hug Engineering AG in Räterschen, Switzer- land, has been successfully developing, engineering and manufacturing catalytic soot particle filters and NOx reduc- tion systems.
	Hug Engineering provides standardised and customised emission reduction solutions for: diesel and gas engines, biogas and bio-oil engines, boilers, incinerators. Hug Engi- neering has agencies all over Europe, USA, Canada and Southeast Asia. Products of Hug are installed in locomo- tives, construction machines, trucks, busses, marine, yachts, power plants, and greenhouses. Trademarks of Hug prod- ucts are: mobiclean, nauticlean, combiKat, COdiNOx.
	Visit Booth #20
Matter Engineering AG	Matter Engineering provide the latest nanoparticle meas- urement and nanoparticle generation solutions. Their exper- tise also includes nanoparticle: sampling, dilution and char- acterisation.
	Matter Engineering's nanoaprticle measurement and gen- eration systems are used in test benches of automotive and filter manufacturers around the world and other markets de- veloping. The instruments are recognised for their position at the forefront of nanoparticle management, they have a high quality standard and are robust and easy to use.
	Matter Engineering also understands that many people are still discovering their nanoparticle needs and provide various services to help companies achieve this goal. Products in- clude: NanoMet-C, REXS and DiSC
	Visit Booth #18
MEL	MANN+HUMMEL, development partner and series supplier to the international automotive and mechanical engineering industries, is committed to the reduction of emissions. In addition to the <b>diesel particulate filter</b> , the company prod- uct range also includes:
5	Crankcase Ventilation Systems
5	Air Cleaners
Ŧ	Preliminary fuel filter
	and Centrifuges
	The MANN+HUMMEL range of products for the reduction of emissions is suitable both for OEM producers and the retrofit market.
	Visit Booth #7

TRUST. SCIENCE. INNOVATION. TSI GmbH Neuköllner Str. 4 52068 Aachen Germany Tel. +49 241 52303 0 Fax +49 241 52303 49 http://particle.tsi.com	TSI develops particle instruments setting the standards – around the world - for highest performance and accuracy. Our complete offering covers sizing, counting, generating and dispersing particles for a wide variety of applications, including vehicle emissions testing, combustion studies, atmospheric aerosol measurement, health effects research, drug delivery development, air filter testing, biological aero- sol detection, nanomaterial synthesis, and much more. Continuously expanding, TSI owns offices in four European countries and is represented in many others. Please visit our booth to learn about our new products and discuss how we might be able to serve your aerosol measurement needs.
	Visit Booth #19
BAUMOT innovative Abgasnachbehandlung	Keep clean! For more than 20 years, the medium-sized company BAUMOT AG has been active in the fields of die- sel engines and drive technology in addition to diesel par- ticulate filter original equipment and retrofitting. The com- pany has a reputation for its high-quality diesel particulate filters, its expert advice and reliable service organization.
	<b>The all-rounder.</b> Construction machines, buses, trucks, commercial vehicles, tractors and ships smoke less thanks to the BAUMOT-DPF system. Or have even stopped completely.
	<b>99% less exhaust emissions.</b> Independent testing centers have performed exhaust analyses for us and have confirmed the following reductions in stable NOx emissions:
	- 99% less particulate matter (PM), - 96% less carbon mon- oxide (CO) - Complete elimination of carcinogenic hydrocar- bons (HC)
	Visit Booth #17
• CAMBUSTION•	Cambustion's DMS instruments were the first, and remain the fastest, real-time ultrafine particle spectrometers. They allow measurement of transient engine particulate emissions (size, number and mass) with automatic accumula- tion/nucleation mode identification, and feature a fully inte- grated 2-stage dilution system.
	The Diesel Particulate Generator (DPG) allows DPF testing without requiring an engine dynamometer. This provides economic and repeatable loading of DPFs with soot from diesel combustion & provides automatic testing of backpres- sure characteristics and filtration efficiency.
	Cambustion also manufacture fast-response gas analysers $(HC, NO_x, CO \& CO_2)$ with millisecond response times. The equipment is used worldwide for transient emissions measurement.
	Visit Booth #9

DSS	The Palas <sup>®</sup> GmbH was established and started operations in 1983. For more than 20 years, the name Palas <sup>®</sup> has been famous for technical competence and new ideas in the field of particle technology and filter testing.
Particle Technology Palas <sup>®</sup> GmbH Greschbachstrasse 3 b 76229 Karlsruhe Germany Tel: +49-(0)7 21-9 62 13-0 Fax: +49-(0)7 21-9 62 13-33 Homepage: <u>www.palas.de</u>	<ul> <li>Palas<sup>®</sup> develops and builds aerosol generators, particle measuring devices, dilution systems, complete filter test rigs and special developments - for many applications e.g. in the automobile industry, chemistry technology, pharma/medicine or environmental technology. The company offers also services as well as annually taking place training courses and seminars.</li> <li>Visit Booth #21</li> </ul>
NOTOX SILICON CARBIDE FILTERS	The Notox DPF is made of Silicon Carbide (SiC), which combined with the outstanding thermal properties, secures a filter monolith that outperforms competing technologies in unmatched durability, filtration efficiency and fuel economy.
	Notox has extensive experience in manufacturing extremely durable and high-performance Silicon Carbide DPFs for OEM and retrofit purposes for the entire range from Light Duty to Heavy Duty vehicles.
	The Notox ceramic technology comprises a thorough under- standing of the chemical and physical reactions involved in creating a highly porous structure of recrystallized Silicon Carbide. Notox has considerable expertise in the develop- ment of highly automated state-of-the-art production facili- ties.
	Visit Booth #8
Excellence in Particle Measurements	Dekati Ltd. designs, manufactures and markets innovative high tech instrumentation for fine particle measurement and sampling. Dekati's fine particle measurement instruments include devices for a wide range of different measurement needs including particle size and charge distribution, number and mass concentration. Together with a comprehensive selection of dilution and conditioning instruments Dekati can provide complete solutions for several different types of ap- plications including combustion and automotive exhaust measurements, air quality monitoring and pharmaceutical inhaler studies.
	VISIT Booth #22

EUS-Testing	The PEUS-Testing GmbH, founded in 2000, is your compe- tent partner in the area of diesel particle filter ageing and development.
	Both for passenger cars and freight vehicles the PEUS- Testing GmbH is presently the only provider for defined soot loading and regeneration of diesel particle filters.
	Our self-developed hot-gas-generators make it possible to realise complex temperature courses by using up-to-date automation processes.
	Secure knowledge about the product is achievable because the test results are reproducible at any time.
	In addition, we offer electordynamic shakers combined with power-vectors and temperatures up to 1000°C and 2 bar back pressure. Motor and chassis dynamometers and emis- sion measurements complete our service spectrum.
	Visit Booth #6
LAVISION We count on Photons	LaVision provides integrated (Laser) Imaging Systems to the scientific and industrial markets. The product range varies from high-speed and ultra-fast CCD cameras and accesso- ries via imaging detectors to measurement technologies and software tools. LaVision is an international company with subsidiaries in France, UK (LaVisionUK Ltd.), the USA (LaV- ision Inc.) and with representatives all over the world. LaVision offers customer designed (Laser) Imaging Systems for reactive and non-reactive flow field analysis, combustion research, fluid mechanics and non-destructive material test- ing as well as optical sensors for in-situ gas analysis appli- cations., focused on species concentration and nano parti- cle (soot) characterization.
	Visit Booth #2
	Car Parts Kuhn GmbH & Co. KG's main line of business is the development of readily marketable and technically ma- ture systems and processes for the automotive sector.
	The company works together closely with universities, col- leges of technology, and other scientific institutes.
	Main products include: DYNTEST Data Logger and Elec- tronic Control Unit for Diesel Particle Filters
	Key Words: Data Logging, Additive Dosing, Diesel Oxidation (HC)
	Visit Booth #3

PROVENTIA	Proventia Emission Control is a specialist in the field of emission control technology. Our mission is to create the most suitable solution for each customer's application to reduce emissions, lower operating costs and ensure the engine's performance.
	Proventia has created flexible concepts for making its spe- cial know-how available for the design of customers new products. We provide complete exhaust systems. Proventia integration package includes prototypes and vari- ous tests, the exhaust gas purification system.
	Proventia has created a number of successful solutions for world leading brands in machine and mining industry. We have also executed significant retrofit projects with excellent results.
	Visit Booth #13
	We care for air. This slogan is a striking description of our company's mission.
Wir filtern Abgase. We care for air.	The HUSS offers entire solutions for exhaust aftertreatment of diesel engines.
HUSS	We are developer, manufacturer and seller of diesel particulate filters for:
	Fork Lift Trucks     Construction machines
	Buses     Conservation (Achieles
	<ul> <li>Commercial Venicles</li> <li>Stationary Generator Sets</li> </ul>
	Special applications
	With 6 different regeneration technologies we have solutions for all possible exhaust gas temperatures.
	Beside our premium quality products we offer a wide range of after sales services. This starts from support for sizing the right filter, proceeds in installing them on the customer's site and ends in maintaining them.
	Visit Booth #10
jing	JING Ltd is a Swiss company for real soot particle generat- ing techniques and provides different types of high- performance soot generators for calibration, filter test, re- search activities and more. The JING soot generators use gaseous and liquid fuel to produce soot and can be de- signed in nearly any size to fit special requirements on the particle characteristics and output (low and high mass). The best known product lines based on JING's techniques are
	been doing its service for companies and universities in many countries. For special applications JING also provides individual solutions.
	Visit Booth #16

Maschinenbau	MAHA Maschinenbau Haldenwang GmbH & Co. KG. stands for high-tech in the field of motor vehicle testing and work- shop outfitting. MAHA test stands are in action throughout the world in the testing of cars, commercial vans, motorcy- cles and special vehicles of all kinds.
Maldenwang R	MAHA workshop equipment covers the entire spectrum: from lifts to service units right up to modern emission testing technology. Individual test units can be networked to create universal test lanes making MAHA a competent technology partner for vehicle manufacturers and testing organizations around the globe.
	Our customers are optimally served on the spot by s.o. sub- sidiaries and dealers in more than 130 countries. In over 35 years of operation, MAHA has become a Global Player in the international vehicle testing business underscoring its strengths of offering individual support and high flexibility.
	Visit Booth #1
	Company Description:
GE Technologies 2	GEO2 Technologies is a Boston-area technology company that has developed a platform of Advanced High Porosity Honeycomb Ceramic Wall-flow Filters. Our filters exhibit high porosity and permeability, low pressure drop, high trap- ping efficiency, and increased catalyst efficiency with high strength and durability. GEO2's materials are extruded into high surface area honeycombs with multiple cell geometries, shapes, and ceramic chemistries.
	Visit Booth #5
innospec fuel specialties	Innospec's dynamic Fuel Specialties business leads the market in innovative additive technology for everything from petroleum-based fuels to coal and biofuels.
	Our team has been at the forefront of the innovative fuel borne catalyst (FBC) technology for many years, with tech- nical expertise, ongoing investment in Research & Devel- opment and worldwide sales and distribution networks.
	Adding a FBC to your engine's fuel is the most reliable and effective way to regenerate diesel particulate filters (DPF). With our unique range of fuel treatments you can completely regenerate a DPF and keep it working efficiently under normal driving conditions, without increasing secondary emissions, especially NO2. Our 3rd generation FBC - satacen® 3 - offers further benefits to both OEMs and the retrofit filter markets.
	Visit Booth #15

WW.akpf.org	<ul> <li>AKPF was founded by the industrial partners of the VERT-project in August 1998. It provides a forum for discussion between diesel particulate filter manufacturers, distributors, and clean air authorities in Switzerland, Austria, Germany, and worldwide. The technical work of AKPF focuses on development of specifications and certification procedures for diesel particulate filter systems. The aim of this task force has broadened considerably, to assist generally:</li> <li>authorities of: law-making, administration and enforcement</li> <li>non governmental organisations,(NGOs)</li> <li>potential users of soot traps, fleet operators,</li> <li>designers of test-stations etc.</li> <li>to design reasonable regulations and rules of how to implement them.</li> </ul>
	Visit Booth #14
	AVL is the world's largest privately owned and independent company for the development of powertrain systems with internal combustion engines as well as instrumentation and test systems.
AVL LIST GMBH Hans-List-Platz 1 A 8020 Graz	The products of the business area Engine Instrumentation and Test Systems comprise all the instruments and systems required for engine and vehicle testing.
Phone: +43 316 787 Ext. 0 Fax: +43 316 787 Ext. 400 eMail: info@avl.com Web: www.avl.com	In 2006 the high-tech company AVL employed 3640 employees worldwide and achieved a turnover of EUR 537 million.
	Visit Booth #4
Fysilrom	PHYSITRON is a newly founded company based on long lasting experience and competence in the field of exhaust treatment of Diesel engines. The off-road business of GREENTOP GmbH has been taken over by PHYSITRON GmbH recently. New and innovative active regeneration processes are our strengths (patented Diesel regeneration burner). In combination with established filter materials of well known producers PHYSITRON will be able to find an innovative and reliable solution for exhaust treatment.
	Visit Booth #12
<b>RP</b> - Systems GmbH	RP Systems, the specialists for Exhaust treatment of con- struction and industrial machinery, buses and trucks.
	RP Systems has developed a computer supported Particle Filter System, which independent from the exhaust tempera- ture and conditions of use, can be retrofitted in all On- and Off- road vehicles.
	RP Systems is a manufacturer and distributor for universal and vehicle specific particle filter systems- your innovative and high-performance partner.
	Visit Booth #11

## **FOYER EO SOUTH - POSTERS**





## FOYER E SOUTH – POSTERS AND ADMINISTRATION





## **FOYER D SOUTH – EXHIBITION**





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