

EMISSION SOLUTIONS IN TRANSPORTATION AFS CONFERENCE



**OCTOBER 15-18,
2007 KENSINGTON
COURT HOTEL
610 HILTON BLVD.
ANN ARBOR, MI 48108 • USA**

TUESDAY, 16.10.2007

**Plenary Session
7:55-8:30 TRACK 1 AND 2**

Plenary Lecture – Engine Emission Regulations, Mr. Cleophas Jackson, EPA

**Numerical Modeling and Simulation for Exhaust Systems -
Dr. Yong Yi, Ansys Inc., USA and Dr. Jerry Liu, Cummins Emission Solutions, Stoughton, WI, USA
8:40 - 10:20 T1.1**

**3-D Numerical Study of Flow Mixing in Front of SCR for Different Injection Systems
Xiaogang Zhang, Eberspacher NA, Novi, MI, USA
8:40**

**Advanced Simulation Technologies: A Fundamental Study for Diesel Particulate Filters with Asymmetric Channel Geometries, Johann C. Wurzenberger, Susanne KutschilIndustrial Mathematics Competence Center (IMCC), MathConsult GmbH, Linz, Austria, Ulrich Pfahl, Robert Diewald, AVL Powertrain Engineering Inc., Plymouth, MI, USA
9:05**

**3-D Transient Elastic Thermal Stress Field During Diesel Particulate Filter Regeneration, Zhenhua Guo, Zhaoyan Zhang and Wen Peng, University of Nebraska-Lincoln Lincoln, NE, USA
9:30**

**Develop a Numerical Model to Predict the Filter Thermal Loading during DPF Regeneration, Yong Yi, Ansys Inc., Ann Arbor, MI, USA
9:55**

**Engine Induction Evaporative Emissions Controls, Mr. Scott Schaffer, Visteon Corporation, Van Buren Township, Michigan, USA
8:40 - 10:20 T2.1**

**High Efficiency Flow Through Hydrocarbon Trap Design for Automotive Air Induction Systems, Mr. Scott Schaffer, Visteon Corporation, Van Buren Township, MI, USA
8:40**

**Evaporative Emissions Testing of Air Induction Systems, Jason Rae, Testing Services Group, Lapeer, MI, USA
9:05**

**Innovative Activated Carbon Products for Hydrocarbon Control in AIS, Moe Elum, Automotive Applications Engineer, MeadWestvaco Corporation, Covington, VA, USA
9:30**

**Soot Particle Emissions From Modern Vehicles, Qiang Wei, Horiba Instruments, Inc., Ann Arbor, MI, USA
9:55**

**Modeling Fibrous and Porous Media
Dr.-Ing. Martin Lehmann, Mann + Hummel, Germany
10:35 - 12:15 T1.2**

**Model Comparisons for Pressure Drop and Efficiency of Air Filters, Jürgen Hoferer, Jörg Meyer and Gerhard Kasper, Institut für Mechanische Verfahrenstechnik und Mechanik, Gas-Partikel-Systeme, Universität Karlsruhe, Germany
10:35**

**Prediction of Pore Size and Pressure Drop of Porous Woven Wire Cloth Filter Media on the Base of Calculation Models, S. Schütz, P. Kopf, M. Piesche, Institute of Mechanical Process Engineering, University of Stuttgart, Stuttgart, Germany
11:00**

**CFD-Based Development of Inertial Separators in Oil Mist Removal from Crankcase Emissions, S. Schütz, K. Kissling, G. Gorbach, M. Piesche, Institute of Mechanical Process Engineering, University of Stuttgart, Stuttgart, Germany
11:25**

**Virtual Diesel Particulate Filters: Simulation of the Structure, Exhaust Gas Flow and Particle Deposition, Stefan Rief, Kilian Schmidt, Andreas Wiegmann, Fraunhofer-Institut Techno- und Wirtschaftsmathematik, Kaiserslautern, Germany
11:50**

**Clean Fuel Technology, Dr. Wu Chen, Dow Chemical, Freeport, TX, USA
10:35 - 12:15 T2.2**

**Biodiesel - Its Attributes & Challenges, Indresh Mathur, Dow Chemical, Houston, TX, USA
10:35**

**Biodiesel Industry Technical Overview, Brendan Prebo, ASG Renaissance, Dearborn, MI, USA
11:00**

**Crankcase Emission Reduction, Dr. Pedro Bastias, Dana Corporation, Paris, Tennessee, USA and Wolfgang Heikamp, MANN+HUMMEL GMBH, Speyer, Germany
1:30 - 1:55 T1.3**

**Crankcase Emissions Control by Using a Multitwister® Air Oil Separator, C. Schürle and T. Sattler-Lägel, Michael Puckett, Product Development Specialist, Dana Corp. - Sealing Products Division, Paris, TN, USA
1:30**

**Inertial Separators – A Review, D. Caloghero, K. Lemke, D. Graf, C. Imhof, M. Puckett, D. Nash and P. Bastias, Dana Corp. - Sealing Products Division, Paris, TN, USA
1:55**

**The influence of CCV Systems on the Exhaust - and Total Emissions, Wolfgang Heikamp, MANN+HUMMEL GMBH, Speyer, Germany
2:20**

**Figure of Merit of Composite Filters with Micrometer and Nanofibers, Jing Wang, Seong Chan Kim and David Y. H. Pui, Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN, USA
2:45**

**STANDARDS AND TEST METHODS
Gerard J. Lynch, International Filter Testing Services Inc. (IFTS) Martinsville NJ, USA
1:30 - 3:10 T2.3**

**Soot Generation and Filter Testing, Susan H. Goldsmith, IBR, Grass Lake, MI, USA
1:30**

**New Developments at ISO regarding Fuel Filter Testing, Christophe Peuchot – IFTS CEO IFTS Inc. - International Filter Testing Services, Martinsville, NJ, USA
1:55**

**40 CFR Part 1065: US EPA's Revised Particulate Measurement Procedures, Matthew W Spears, U.S. Environmental Protection Agency, Ann Arbor, MI, USA
2:20**

**Introduction to the NEW AFS Test Standards Database, Gerard J. Lynch, International Filter Testing Services Inc. (IFTS) Martinsville, NJ, USA
2:45**

**TESTING OF ENGINE FILTERS -
Dr. Martin Schmidt, Palas GmbH,
3:25 - 5:05 T1.4**

**Initial Fractional Efficiency Measurements of Filter Media in Accordance with Standards ASHRAE 52.2/EN779, ISO 11155-1, ISO CD 19713, Dipl.-Ing. Martin Schmidt, Palas GmbH, Karlsruhe, Germany
3:25**

**Test Rig for Characterisation of Oil Separators, Reproducible, Reliable and Quick Measurements and Thus Economic, Dipl.-Ing. Martin Schmidt, Dipl.-Ing. Sven Schütz, Palas GmbH, Karlsruhe, Germany
3:50**

**About Standard Test Fluids to Measure Water Separation Efficiency of Diesel Fuel Filters, C. Peuchot, N. Petillon, G. J. Lynch, International Filter Testing Services Inc., Martinsville, NJ, USA
4:15**

**Diesel Exhaust Emission Control - DPF and SCR Systems, Mr. Mehboob Sumar, Bodycote Testing Group, Ontario, Canada
3:25 - 5:05 T2.4**

**Integration of an SCR System on an engine dynamometer for a MD-HD US 2010 application, Shyam Santhanam¹, Vadim O. Strots¹, Sean C. Wyatt¹, and Chengke Liu²
¹International Truck and Engine Corporation, Warrenville, IL 60555, USA, ²Engine Technologies, Bodycote Testing Group, Mississauga Ontario, Canada
3:25**

**Solutions to Nanoparticulate Emissions in Transportation, S. K. Kawatra, Department of Chemical Engineering, Michigan Technological University, Houghton, MI, USA
3:50**

**Simulation of Diesel Particulate Filtration Equipment, Cornel Mueller, CD-adapco, Plymouth, MI, USA
4:15**

WEDNESDAY, 17.10.2007

**Plenary Session
7:55-8:30 TRACK 1 AND 2**

**Plenary Lecture – CARB'S STRATEGIC VISION ON AIR QUALITY AND EMISSIONS –
Mr. Erik White, California Air Resources Board**

**FILTER MEDIA IN ENGINE FILTRATION -
Dr. Christine Stanfel, Ahlstrom Engine Filtration, Madisonville, KY, USA
8:40-10:20 T1**

**Porous Media of Micro Fibers and Spheres, R. Bharadwaj and G.G. Chase, Microscale Physicochemical Engineering Center, The University of Akron, Akron, OH, USA
8:40**

**Nanofiber Layer Morphology and its Role in Air Filter Applications, Miroslav MALYx – Stanislav PETRIKx – Jiri DUCHOSLAVx – Lukas PLISTILx, – Jakub HRUZAXx, x Elmarco Ltd., Liberec, Czech Republic, Technical University of Liberec, Czech Republic
9:05**

**Ceramic Nanofiber Filter Media for Hot Gas Filtration, B. Raghavan and G.G Chase, The University of Akron, Akron, OH, USA
9:30**

The Impact of Ultra-Fine Bypass Filtration on Extended Drain Intervals, *Ritchie C. Russell, CFO, Cleantechnics International, Inc., High Point, NC, USA and Terry Gilbert, Mechanical & Aerospace Engineering, NC State University, Raleigh, NC, USA* 9:55

Cabin Filtration - Dr. Pius Trautmann, MANN+HUMMEL, Germany 8:40-10:20 **T2.1**

Hybrid Membrane Technology for Cabin Air Filtration, *Hank Chi and Hyun Lim, DuPont, Richmond, VA, USA* 8:40

On-Road and Laboratory Evaluations of Cabin Air Filters using Integral Number and Surface Area Concentration Monitors, *Chaolong Qi, Nick Stanley and David Y. H. Pui, University of Minnesota, Minneapolis, MN, USA* 9:05

Nanoparticle Filtration, Clean Air in Vehicles and Homes, *Andreas Mayer, Technik Thermische Maschinen, Niederrohrdorf, Switzerland* 9:30

Nanoparticle Agglomerates Penetration: Effect of Agglomerate Structure on Filtration Efficiency, *Seong Chan Kim¹, Jing Wang¹, Mark S. Emery¹, George Mulholland², *David Y.H. Pui¹, ¹University of Minnesota, Minneapolis, MN, USA; ²University of Maryland, College Park, MD, USA* 9:55

Crankcase Coalescing Filtration - Dr. Christopher E. Holm, Cummins Filtration - Stoughton, WI, USA 10:35 - 12:15 **T1.2**

Effect of Gravity on Coalescence Filtration, *S. U. Patel & G.G. Chase, The University of Akron, Akron, OH, USA* 10:35

Performance of Metalworking Fluid Mist Collector Elements Over Time, *Peter Waschitz, Wilhelm Höflinger, Vienna University of Technology, Institute of Chemical Engineering, Vienna, Austria* 11:00

Crankcase Ventilation Systems, *Priya Srinivasan, Tom Tomchak, Wally Stone, Racor Division, Parker Hannifin, CA, USA* 11:25

Coalescing Crankcase Ventilation Systems for 2007 On-Hwy Engines, *Brian W. Schwandt and Christopher E. Holm, Cummins Filtration, Stoughton, WI, USA* 11:50

Specialty Filter Media and Special Methods for Emissions Reduction - Edward Gregor, Edward C. Gregor & Associates, LLC, Charlotte, NC, USA 10:35 - 12:15 **T2.2**

Hydrated Cooled-Filtered-EGR-FBC-OBC-DPF system Reduces NOx-PM to Meet Euro-5 Now with Fuel Saving, *Dr. Julius Rim, President, Greenpower Div., Intermet, Ltd., Northville, MI, USA; N. Yoshikawa, O. Kubota, S. Science, Co., Ltd., Tokyo, Japan* 10:35

Next Generation Phenolic Resin Systems for the Changing Engine Filter Media Market, *Dr. Anthony Lawson Group Leader Cellulose Advanced Media Technology Hollingsworth and Vose, Hatzfeld/Eder, Germany* 11:00

Characterization & Integrity Testing Of Filtration Media Utilizing A Unique Corona Beam Technology Compressed Natural, *Gregory J. Gormley, President, ConverTec Corporation, Newtown, PA, USA* 11:25

From Disposable to Regenerative DPF Media- Novel approaches with Fibrous Media, *Francesca Montefusco, Ina Parker, Ashish Mathur, Research & Technology Development, Ahlstrom Filtration, Madisonville, KY, USA* 11:50

Emission Measurement and Reduction, *Dr. Manijeh Razeghi, Northwestern University, Director of Center for Quantum Devices, Evanston, IL, USA* 1:30 - 3:10 **T1+T2**

VERT-Principles of Particle Filter Verification based on Health-affecting Parameters like Solid Particle Size and Secondary Emissions, *Andreas Mayer, Technik Thermische Maschinen, Niederrohrdorf, Switzerland* 1:30

New Methods for Conformity-of-Production and In-Use-Compliance Testing of Filters, *Dr. Markus Kasper, Matter Engineering AG, Bremgartenstrasse, Switzerland* 1:55

Investigations on the Influence of Higher Compression Ratio And Piston Crown Geometry On The Performance of Compressed Natural Gas Engines, *Rajesh C. Iyer¹Sagas Autotec Pvt Ltd, Mysore, India; Wg. Cdr. Mallikarjun Vaggar², Dr. T. R Seetharam² P.E.S Institute of Technology, Bangalore, India, Dr. S. A Channiwala³ Sardar Vallabhbhai National Institute of Technology, Surat, India* 2:20

IR-excited Fuel for Improved Engine Efficiency, *Albert C. Wey * Aldi Far-IR Products, Inc., Westmont, IL, USA; Rodney G. Handy, Yuan Zheng, and Chul H. Kim, Dept. of Mechanical Engineering Technology, Purdue University, Lafayette, IN, USA* 2:45

Emerging DPF Technologies for 2010, *Mr. Richard D. Nixdorf, Industrial Ceramic Solutions, Oak Ridge, TN, USA* 3:25 - 5:05 **T1+T2**

Development, Properties and Filtration Performance of Acicular Mullite as an Advanced Ceramic Material for Diesel Particulate Filter Application, *Michael Malanga*, Steve Martin, Jeff Montanye, and Frank Mao, *Advanced Technology at Dow Automotive, Auburn Hills, MI, USA* 3:25

Microwave-Regenerated Ceramic Fiber Diesel Particulate Filter, *Richard D. Nixdorf, Industrial Ceramic Solutions, Oak Ridge, TN, USA* 3:50

Advanced High Porosity Ceramic Honeycomb Wall Flow Filters, *Bilal Zuberi*, James J. Liu, Sunilkumar C. Pillai, Jerry G. Weinstein, GEO2 Technologies, Inc., Woburn, MA, USA; Athanasios G. Konstandopoulos, Souzana Lorentzou, Chrysa Pagoura, Aerosol Particle Technology Laboratory, CPERI/CERTH, Thessaloniki, Greece* 4:15

Effects of ULSD on Old and Modern Engine Emissions. Measuring the Chemical Species from Engine Exhaust Emissions, *Z. Gerald Liu and Victoria Vasys, Cummins Emission Solutions, Stoughton, WI, USA; and David Kittelson, University of Minnesota, Minneapolis, Department of Mechanical Engineering, Minneapolis, MN, USA* 4:40



THURSDAY, 18.10.2007

Plenary Session
7:55-8:30 TRACK 1 AND 2

PLENARY LECTURE – FUTURE LOW EMISSION DIESEL ENGINES –
Dr. Wayne A. Eckerle, VP-Research & Technology, Cummins Inc.

Engine Fuel Filtration -
Dr. Barry Verdegan, Cummins Filtration, Stoughton, WI, USA 8:40 - 10:20 **T1.1**

Adsorptive Desulfurization of Logistic Fuel, *Fan Shi, Brian Turk, Gupta Raghubir, RTI International Center for Energy Technology, Research Triangle Park, NC, USA* 8:40

Overcome Emulsified Water Filtration Problem in ULSD Through Stringent Test Methodology and New Media Design, *Chuanfang Yang, Ph.D., Donaldson Company, Inc, Minneapolis, MN, USA* 9:05

Fuel Water Challenges for High Pressure Common Rail Systems, *Barry Verdegan, Harold Martin, and Travis Goodlund, Cummins Filtration Inc., Stoughton, WI, USA* 9:30

Factors of Influence in Water Separation from Diesel Fuels, *Christine M. Stanfel, Ahlstrom Engine Filtration, Madisonville, KY, USA* 9:55

Engine Air Filtration -
Mr. Neville Bugli, Visteon Corporation, Van Buren Township, MI, USA 8:40 - 10:20 **T2.1**

Enhancing Automotive Air Filtration Systems, *C. Gutfinger, M. Fichman and L. Moldavsky, Technion - Israel Institute of Technology, Haifa, Israel* 8:40

Performance of Multi-Stage Engine Air Filter, *Tadeusz Jaroszczyk, Stephen L. Fallon, Thomas P. Sonsalla, and Jerald J. Moy, Cummins Filtration Inc., Stoughton, WI, USA* 9:05

Various Methods of Fibrous Filter Efficiency Calculation, *Anna Bałazy^{1,2}, Albert Podgórski², ¹ Cummins Filtration, Stoughton, WI , USA; , ² Warsaw University of Technology, Warsaw, Poland* 9:30

Theoretical Calculations of Filtration Efficiency of Aggregated Nanoparticles in Fibrous Filters, *Albert Podgórski¹, Anna Bałazy^{1,2}, ¹Warsaw University of Technology, Warsaw, Poland, ²Cummins Filtration Inc., Stoughton, WI, USA* 9:55

Expert Panel Discussion: Diesel Fuel Filtration for Emission Control - Issues, Challenges and Solutions, *Facilitation: Dr. Barry Verdegan, Cummins Filtration, Stoughton, Wisconsin, USA* 10:35 - 11:50 **T1.2**

Expert Panel Discussion - The Role of Nanotechnology in Emission Reduction in Transportation - Professor George Chase, Professor Sadhan Jana, Akron University, Akron, Ohio, USA, Professor Albert Podgorski, Warsaw University of Technology, Warsaw, Poland 10:35 - 11:50 **T2.2**