

## ExIS Newsletter, April 2009

### Pegasor PPS sensor launched

The Pegasor Particle Sensor (PPS) has been launched. Production started in March and the first batch of some 10 sensors was delivered to various customers at end of March. Demonstrations at customer sites have already been made and will come during spring/summer 2010. Please contact us if you are interested in a demonstration.

The Pegasor Particle Sensor (PPS) monitors fine particles for extended periods without costly user maintenance or expensive consumables. PPS measure directly in raw exhaust and thus, it needs no external sampling and dilution. The simplicity and robustness of the PPS has been specifically designed to facilitate for environmentalists, hygienists, and authorities to develop realistic management strategies. At a sampling rate of up to 100 Hz, PPS provides an exceptional time response.

Pegasor's unique sensor technology measures fine and ultrafine particles in a variety of often harsh environments and permits long term monitoring of these ubiquitous pollutants. For the industrial customers PPS offers superior time resolution and sensitivity. Along with the user friendliness, PPS is the most powerful tool e.g. for monitoring of automotive emission and stack emission in real world conditions.

In short, PPS offers:

- Real time and continuous operation
- High sensitivity to fine and ultrafine particles
- Measurements are unaffected by flow rate, pressure and temperature changes in the sample
- No dilution needed
- Highly flexible "plug and play" system
- Robust stainless steel construction for maintenance free operation

This unique development from Pegasor enables the sensor to report reliable data on both particle mass and particle number concentrations in real time. Highly integrated data logging software produces ASCII format files for real time and post processing. Up to 8 sensors can be connected to the data logging system in the PC via a data bus. This is ensured by, among other things, providing waterproof connectors and a sensor bus cable with up to 50 m length via the USB interface to the host computer.

The Pegasor particle sensor operates by electrostatic charging of particles passing through the sensor and then measuring the current caused by the charged particles leaving the sensor. The flow-through design keeps the sensor clean for extended operation and low maintenance. The particle charger is only exposed to clean air.

[PPS brochure](#)



## New instrument from Matter Engineering

Instruments for particle number (PN) measurements in the automotive industry have been around for a while now. These instruments rely on number counting using a condensation particle counter (CPC) that require the use of butanol, which pose some inconvenience in operation and handling. Furthermore, these instrument systems are built into relatively large instrument racks that have limited mobility.

Matter Engineering has developed a new instrument, the NanoMet III, which overcome some of the drawbacks of conventional instruments in this field. The use of a counting instrument that uses electrical charging of particles reduced both cost and enhances user friendly operation. All issues linked to the use of butanol working fluid are avoided. The instrument is also much more compact and might even be used for on-board applications.



The NanoMet III solid particle counter is based on patented diffusion battery technology. The counter is coupled to a raw gas diluter and a thermodiluter that guarantees a PMP (R83) compliant volatile particle remover (VPR).

In short, the features of the NanoMet III instrument are:

- Patented all electric counting technology
- No CPC needed
- Easy handling
- Compact instrument

More information about the NanoMet III instrument can be found in the brochure via the link below. An updated data sheet on the new MD19-3E rotating disk diluter is also provided via the link below.

[MD19-3E brochure](#)

[Nanomet III brochure](#)

Some product information about the NanoMet III including advertisement is provided in the latest issue of the Automotive Testing magazine:

<http://viewer.zmags.com/publication/a003c0bd#/a003c0bd/82>

<http://viewer.zmags.com/publication/a003c0bd#/a003c0bd/78>

## Product news from Dekati

### Update on DEED

The offer of accessories for the Dekati DEED-100 dilution system for automotive particle number measurements according to the PMP protocol (R83) has been updated and extended. The list now comprises the following items:

- DEED-150 post-DPF sampler
- DEED-300 pre-DPF sampler

- DEED-400 Stack sampling accessories for stationary source emission measurements
- DEED-500 PMP compliant cyclone
- DEED-900 AK-protocol software
- FPS-4001 Pressurised air filtration and drying unit

More information about the accessories can be found in the DEED documentation, which is accessible from the links below. Further comments that can be added are: The price for the DEED-300 pre-DPF sampler has been reduced by 35 % since last year, a cyclone specially adapted for DEED has been added and the air-cleaning FPS-4001 unit is sourced from a new supplier.



It is of interest to note that the DEED-150, which uses a heated stainless steel sampling line, can be combined with other equipment to create a “PMP-like” sampling and dilution to be used for instruments (e.g. ELPI, DMM, etc.) that should have a lower dilution ratio than particle counters, particularly in applications where the particle level is very low. For example, DEED-150 and DEED-300 can be combined to enable “PMP-like” sampling before exhaust aftertreatment in engines with low engine-out particle levels, where normal PMP sampling systems (as DEED-100) would give too high dilution levels for the mentioned instruments. Similarly, a solution for tailpipe sampling at low dilution ratio is available by combining DEED-150 with the ejector diluter from DEED-300. In this setup, the influence of temperature and pressure is eliminated by use of the heated sampling line and by pressure balancing of the ejector diluter (diluter exhaust is connected to the tailpipe downstream of the sampling point).

It has come to our attention that some customers have the impression that the DEED-100 does not comply with the PMP regulations. This is not true. DEED-100 is fully PMP compliant. A confirmation of that statement is that DEED has been chosen by JRC as the “golden” standard for the round robin calibration exercise in the UN-ECE Particulate Measurement Programme (PMP).

Note that the accessories for DEED are also available for our complete PMP measurement system from Ecomesure (link below).

The low particle loss of the DEED in comparison to all other dilution systems is a significant advantage. A summary of the VPR test results from the draft heavy-duty PMP report is provided by ExIS via the link below.

[DEED brochure](#)

[DEED accessory note](#)

[DEED-300 description](#)

[ExIS summary of VPR results](#)

[Ecomesure RS PMP brochure](#)

## Collection foil transport cassette

A rather insignificant-looking accessory has become one of our top selling products regarding the number of units sold. This is the collection foil transport cassette, CFC-250. This is a practical solution for transporting impactor substrates without spoiling them.

The CFC-250 collection foil transport cassette is made of static-dissipative



plastic in a clamshell design that locks the periphery of the foil into place several millimetres from any surface. This way, the particle losses due to shifting and static build-up are prevented. Each foil cassette has an area for labelling the sample.

The transport foil cassette is intended for collection foils used in the Dekati® Low Pressure Impactor (DLPI), ELPI™ impactor and Dekati® PM10 impactor. All these impactors use substrates of 25mm in diameter.

[Transport foil cassette accessory note](#)

### High-temperature Apiezon grease

Since the maximum temperature of Apiezon-L grease is around 150°C, it is not suitable for high temperature measurements. An alternative for Apiezon-L is Apiezon-H grease which is also suitable for impactor measurements. The maximum temperature of Apiezon-H is 240°C.

### ELPI software update

ELPIVI 4.0 software has been tested in Windows 7 environment. The operation requires installation of additional components. These together with detailed instructions on the installation are now available in Dekati customer pages section at the Dekati website.

ELPIxls and ELPI charge data processing spreadsheets have been modified for better compatibility with Office 2007. Mass median diameter calculation has also been added in both versions of the ELPIxls.

New official version of ELPIVI software is ELPIVI4.0 rev 615b. With the previous version, rev 615, a problem was noticed in the displayed data when using different density values. The saved data measured with rev 615 had no problems and no changes have been made to that in rev 615b.

If you have not yet registered to get access to the customer pages to download the software mentioned above, you can do so at the Dekati website ([www.dekati.com](http://www.dekati.com)).

### Dekati CRC presentation

At the recent CRC On-Road Vehicle Emission Workshop in San Diego (see link below), USA, Erkki Lamminen had a presentation titled:

*PMP Compliant Particle Number Measurement Systems Using Ejector Diluters and Thermodenuders*

[Dekati CRC presentation](#)

[CRC workshop](#)

## New products from Topas

Three new products from Topas have recently been introduced on the market. A short description of each of them is included below.

### PAP 610, Process Aerosol Photometer

The Process Aerosol Photometer Topas PAP 610 was developed for in-situ-concentration measurement of blow-by aerosols. This measuring instrument is an addition to the Gravimetric Measurement System GMS 141, which is also provided by Topas. The GMS 141 is used for calibrating the PAP 610. In short, PAP 610 offers:

- In-situ-concentration measurement of blow-by aerosols
- Additional particle size information by use of two wavelengths
- No condensation due to heatable measurement chamber
- Integrated sheath air



## [PAP 610 brochure](#)

### **GMS 141, Gravimetric measuring system**

Decrease of oil consumption as well as reduced component abrasion is of utmost importance to help realize sophisticated exhaust standards for piston engines. Oil mist separators are basic components of a crank case ventilation system. They will be benchmarked after differential pressure and oil flow. The Topas gravimetric measurement system GMS 141 allows the comfortable detection of oil content in blow-by after oil mist separators with a filter blank sheet or filter cartridge directly on engines or engine test stands. The measuring device combines a simple and rugged assembly with an economic low-cost manual application and handling. The device is controlled via visualisation in a web browser. Features of GMS 141 are:

- Time-saving reproducible detection of oil content after oil mist separator in blow-by of combustion engines
- Installation of two different absolute filters possible.  
Selection by flow rate and filter charging:
  - Filter blank sheet with 110 mm diameter or
  - Filter cartridge with 65 mm diameter, L = 93 mm
- Two independent sections: bypass and measuring. Running up to the working point over bypass section and measuring over measuring section. Prevention of undesirable filter charging.
- Switching between both sections with pneumatic ball valves;
- feature: manual or automatic switching (by default time or differential pressure)
- Heatable absolute filter box in order to avoid condensation (up to 110 °C)
- Display for differential pressure at absolute filter (information about filter charging)
- Display for blow-by-temperature and absolute filter temperature
- Convenient device control with web browser
- Easy to use, rugged, space-saving design



## [GMS 141 brochure](#)

### **MBP 116, Manual Filter Media Test Rig**

Performance of filter media is essentially defined by parameters such as differential pressure, gravimetric filtration efficiency and dust holding capacity. The Topas Manual Filter Media Test Rig MBP 116 can be applied to determine these filter parameters at flat sheet materials. This test rig has

been designed as universal testing equipment. It combines a simple and robust setup with a manual and therefore cost efficient handling and operation. Features of the MBP 116 are:

- Reliable timesaving testing of gravimetric filter efficiency, dust holding capacity, differential pressure and fractional filter efficiency
- Simple operation in combination with a robust, space saving design, modular setup (benchtop model)
- Holders for test filter and backup filter separately removable, weighable without filter removal
- Adjustable flow rate from 0.5..15.5 m<sup>3</sup>/h, steps of 0.5 m<sup>3</sup>/h
- Backup filter for protection of the flow rate unit in case of a filter breakthrough
- Integrated solid aerosol generator SAG 410/U (new development of Topas) for smallest feeding rates starting at approximately 70 mg/h
- Port to connect a vacuum cleaner
- Customized test rig specification



[MBP 116 brochure](#)

## Update on the progress of standardisation

### CEN standard for ambient air measurements

The CEN standard for the measurement of particle concentration and size distribution in ambient air progresses. ELPI will be included in the standard as a particle size distribution measurement instrument. The standard is based on the already released VDI guideline 3867, in which ELPI is described in blatt (part) 6. We will update with information on the progress of this working group in later newsletters and on our home page.

### European standard for measuring PM from small fireplaces

A new European standardisation group started working in March on defining a method to measure PM from small fireplaces. The working group is called CEN TC 295 WG 5. The aim of Dekati is to include the Dekati® PM10 impactor with an optional dilution system as the standard method for measuring PM from small scale combustion processes. We will update with information on the progress of this working group in later newsletters and on our home page.

## Conferences, exhibitions and workshops

### Documentation from Topas customer seminar, April 13

The Topas customer seminar was held in Stockholm on April 13. Documentation from the seminar is now available. By clicking on the link below, you can send an e-mail and ask for the documentation.

[Documentation from the Topas seminar](#)

### Grimm customer seminar on April 27 in Stockholm

Our yearly customer seminar with Grimm is to be held on April 27 in Stockholm. In case of unexpectedly many participants we will also lecture on April 28.

Grimm has a strong position on the market and technically leading and versatile instruments for the measuring of particles in air and other gases in the environment, in work places and for research. With the nano instruments, the measuring range is extended to below 3 nm in real time.

The seminar will cover all these areas with Dr. Friedhelm Schneider as lecturer and instruments will be demonstrated. Case studies will be presented by users. Instruments that will be presented are among others #180 for the environment, #1.108 and #1.109 for internal air quality and complements for the registration of weather data (#365), for PAH, for biologically active substances and for nano particles (SMPS+E and WRAS).

A detailed programme will be issued well before the seminar. There is no seminar fee. Questions could be mailed or communicated on phone +46-8 6474599.

[Registration to the Grimm seminar](#)

### Dekati customer seminars 2010

Our yearly customer seminars with Dekati will be held in May on the following locations/dates:

- Gothenburg: May 24
- Stockholm: May 26

We will provide more information on this seminar later. You can register for the seminar by using the link below. Latest date for registration is 10 May.

[Registration to the Dekati seminars](#)

### ELPI Training/workshop

Many of our customers have expressed interest in training on the ELPI instrument and we are now able to provide this service. The training will be held at ExIS premises in Älvsjö (Stockholm) on May 27 with Henna Isherwood from Dekati as lecturer. Selected customers will also highlight specific applications of the ELPI instrument. An invitation with the preliminary programme is available on ExIS home page. The training will be held in English but with option for questions and discussion in Scandinavian languages. A prime cost of maximum 100 € will be charged for the training. Lunch and coffee is included in this cost.



In conjunction with the ELPI training, we will also organize a seminar on May 26 for demonstrating Dekati products (see above).

[Registration for ELPI training 2010](#)

### **Grimm workshops in 2010**

The schedule for the Grimm workshops in 2010 has now been posted on the Grimm website. More information on the content of these workshops will be provided later.

It is also of interest for you to note that if you have purchased a Grimm instrument during the last year, you are entitled to one day of training at Grimm premises in Germany (Ainring or Pouch). This training is free of charge. Hotels can be booked with Grimm's discount.

[Grimm workshops, schedule](#)

[Grimm training](#)