ExIS Newsletter, December 2014

Preamble

In continuation to our earlier newsletters, now we would like to give you some update on our products, trends and general news in the field. The most significant message in this newsletter is the launch of Dekati DLPI+ gravimetric impactor.

(Tips: Click on the headlines below to navigate to the section of interest in the document. If you are reading the newsletter in a smartphone, you may have to download the whole e-mail before the links in the document work properly.)

Headlines

ExIS, Exhaust Instruments ScandinaviaAB
Varuvägen 9
SE-125 30 Älvsjö
SWEDEN

Phone +46-8-647 45 99
Phone +46-739-44 34 01
Phone +46-705-67 61 23
E-mail: info@exisab.com

Org.nr/Moms.nr 556655-2880
VAT.no SE556655288001
Bankgiro 5755-0170

New improved Dekati gravimetric impactor DLPI+ launched

Dekati has launched an improved version of their gravimetric low pressure impactor. This has been developed as a successor to the Dekati's existing gravimetric impactor DLPI. The most important upgrades to DLPI+ are the increased size fraction from 12 to 14 stages with improved size range from 16 Nm to 10 µm. DLPI+ is equipped with its own mounting base with an integrated pressure monitoring system (40 mbar) for ease of operation and better accuracy. Due to the significant redesign, the DLPI+ impactor can be readily used with an ELPI+ without any modification.

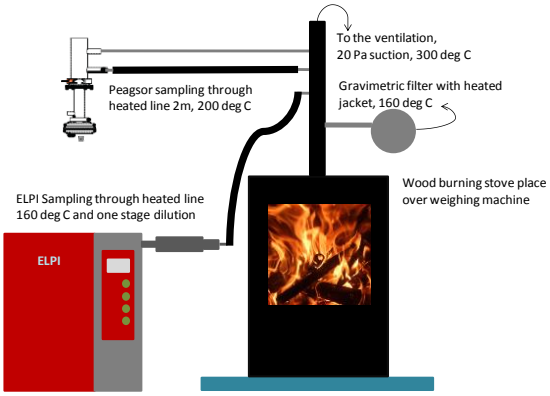
If needed DLPI+ can be heated up to 180°C using a high temperature up gradation kit, the standard DLPI+ can operate up to 50 °C. The diameter of the particle collection area in each collection stage is 25 mm and can be used for chemical analysis of the collected sample. The DLPI+ operates at a sample flow rate of 10 lpm. DLPI+ comes with the data processing spreadsheet for analysing the results.

DLPI+ brochure

Product demonstration videos - Grimm

Grimm has added a series of demonstration videos to their website. These videos can be accessed through the following link http://www.grimm-aerosol.com/en/service/grimm-tv.html. These videos vividly describe the functionality, operation and salient features of Grimm instruments.

New application for Pegasor M-Sensor, Soot measurement from small scale combustion



Through a series of experiments conducted by ExIS AB at a leading research institute in Sweden, Pegasor's M-Sensor proved its ability to measure soot from small scale combustion device effectively. Originally intended to be used for measuring particulate emission from automobiles, now particulate emission from small scale combustion devices such as wood burning stoves as well can be measured using the sensor.

Soot measurements on small scale combustion devices were executed without any physical modification to the sensor itself, although with a different trap voltage setting. A higher trap voltage was used during this experiment to have a higher cut point and to provide the best accuracy for PM measurement. The soot emission from small scale combustion device is expected to vary between different systems hence the M-Sensor should be calibrated for PM against gravimetric PM measurement specific to the system under measurement.

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Most of the contemporary small scale combustion devices are expected to emit soot within the limits tolerable to the stand-alone Pegasor M-Sensor. For small scale combustion devices with higher soot emissions, the Mi3 system with integrated dilution is recommended. A detailed summary of about measuring soot from small scale combustion device using Pegasor M-Sensor is provided via the link below.

Pegasor M-sensor in small-scale combustion, application note

Pegasor M-sensor brochure **Pegasor Mi3 brochure**

On-board particle emission measurement using Pegasor

ExIS AB in association with Pegasor, Finland has initiated a measurement campaign in Stockholm to measure particle emission from vehicles in real time. These measurements highlight the significance of measuring particle emission in real time driving condition. The preliminary tests covered on-board measurements on passenger cars, both diesel and gasoline with different engine technologies CRDI, MPFI, GDI, Flex fuel (E85) available in the market. The results indicate significant difference in particle emission from cars using different technology and different fuels. Similarly vehicle operation such as cold start, hard acceleration, coasting etc. as well has noticeable impact on the particle emission from the vehicles.

From the data gathered so far, CRDI car with DPF seems to be the least polluting in terms of particulate number and mass. Although this experiment was an inception study and did not follow the strictest scientific practice applicable, the data gathered in the experiment provides a candid snapshot of the level of particulate emission from passenger cars. A detailed summary of the tests can be provided on request.

In this context, some of you might ask for the report from JRC about on-board PN instruments, such as e.g. Pegasor Mi3 and NanoMet3 from Matter Aerosol (see below). Unfortunately, this report, which was available in draft version already in the spring, has not yet been published. We will post news on this topic at our home page as soon as we know more.

Real-life nanoparticle measurement with the NanoMet3 instrument from Matter aerosol

An update on the NanoMet3 instrument for on-board measurement of solid particle number is provided in the latest issue of Automotive Testing Technology (ATT) magazine.

The new portable emission measurement system (PEMS) measures the concentration and average diameter of solid particles in the size range of 10-700nm under real driving conditions. It performs highly accurate measurements with online response over a wide range of concentrations. To measure only the solid particle fraction, it is necessary to condition the sample thermally to eliminate the volatile fraction. NanoMet3 features a conditioning of the exhaust probe according to Matter's patented ThermoDilution principle, which is fully PMP compliant. Measurements on chassis dynamometers have shown correlation factors >95% for particle number compared to PMP benchmark systems.

Article and ad in ATT

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Topas aerosol generator FCS 248

Topas has introduced a new aerosol generator FCS 248 intended as a calibration system for aerosol photometers and particle counters. FCS 248 can consistently produce aerosol with similar characteristics in the size range of 0,1 to 0,5 µm and can produce a maximum mass flow rate of 1 g/m^3. This device has compact dimensions, weighs 15 kg and can be operated using battery making it convenient to handle. Three instruments can be attached to it at the same time for calibration; the calibration is effected by means of the comparison between the three attached instruments. At the moment, the brochure is only available in German.

FCS 248 brochure (in German)

Proposed Stage V emission standard for Non-Road Mobile Machinery

European Union has adopted a proposal to further tighten the emission limits for Non-Road Mobile Machinery (NRMM). Several categories of mobile machinery using fossil and similar bio fuels are covered under this proposed legislation, including rail engine, inland waterway vessels, hand held devices, farm equipment, snow mobiles, all-terrain vehicles etc. This legislation is scheduled to be enforced by the beginning of 2018 for certain categories of machinery, extended to the rest of the categories by the beginning of 2020. Compared to the existing Stage IV legislation PN count of 1 x10^{12}/ kWh has been introduced for engines with power output ranging from 19 – 560 kW, the PN count is substantiated by a PM limit of 15 mg/kWh for the same class of engines. Similarly all the inland waterway vessels with more than 300 kW power output are covered with a PN limit. However no PN limit has been recommended for engines with more than 560 kW power output. NO_X limits are similar to the Stave IV legislation for engines with less than 560 kW power output and for engines with higher output a limit of 3.5 g/kWh has been proposed. Military and similar vehicles operating in explosive environment are exempt from Stave V legislation.

Conferences, exhibitions and workshops

An updated list of conferences, exhibitions and workshops where we will participate is provided.

Demonstration of new Grimm instruments in Stockholm, November 26, 2014

The new Grimm instruments, 11-R, 11-E and 1371 (Mini-WRAS) were demonstrated at ExIS premises in Älvsjö on November 26, 2014. If you are interested in the documentation from this event, just send us an e-mail and ask for whatever you are interested in.

For registration to the demonstration, send an e-mail with your name and contact information.

11-E brochure **11-R brochure** **Mini-WRAS brochure**

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ExIS news, December 2014

We wish you a Merry Christmas and a Happy New Year

During the days between Christmas and New Year, the staff at ExIS will be on vacation. We will continuously follow e-mail and answer the phone most of the time during this period but we may not always be able to respond as promptly as we would wish.

You are always welcome with questions and we are happy to send you our newsletter.

E-mail: info@exisab.com
Peter Ahlvik
phone: +46-739-44 34 01

Internet: www.exisb.com
Staffan Larsson
phone: +46-705-67 61 23

Rajagopal Vijayaraghunathan
phone: +46-764-09 83 06

Best regards,

Peter Ahlvik, Staffan Larsson and Vijayaraghunathan Rajagopal

ExIS AB

ExIS represents the Finnish company PEGASOR, the German company TOPAS, the Swiss company MATTER AEROSOL and the French company ECOMESURE in the Scandinavian and/or Nordic countries. We also represent the Finnish company DEKATI in Sweden and Norway and the German company GRIMM AEROSOL TECHNIK in Sweden. Detailed information about these companies and their products can be found at our **home page**.

ExIS provide equipment and instruments for sampling, dilution and measurement of particles in air, exhaust and other gases. Our customers are at universities, research institutes, municipalities, hospitals, automotive industry, shipping companies, combustion applications, electronic industry, mechanical industry, metallurgical industry, process industry, pharmaceutical industry and filter manufacturers.

More information

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Do you have questions or comments? Send an e-mail to: info@exisab.com or phone +46-739-44 34 01