

An aerial photograph of a silver car driving on a road, surrounded by lush green trees. The car is positioned in the upper half of the frame, moving towards the bottom. The road has white dashed lines. In the top right corner, the word "pegasor" is written in a white, lowercase, sans-serif font, with a green circular logo element integrated into the letter 'o'.

pegasor

PEGASOR

PPS-G2

Industrial particle sensor for regulatory PTI testing

ENGINE EMISSION

MONITORING WITH PEGASOR G2



Ultra fine particles (UFP) in the air present a serious health risk to the people. Their source in ambient air is mostly traffic and energy related combustion sources.

Engine emissions are widely regulated and Pegasor technologies are globally well adopted by industry testing facilities. Today these state-of-the-art technologies are also being introduced to periodic technical inspection programs (PTI). More and more also ambient air quality and indoor air quality are gaining interest.

Pegasor G2 sensor is a new solution for real-time monitoring of Particle Number (PN). Sensor can be easily adopted to wide range of applications. It is the most capable and reliable source for demanding industrial measurement and monitoring of Ultra Fine Particles.

PROVEN TECHNOLOGY & RESULTS.

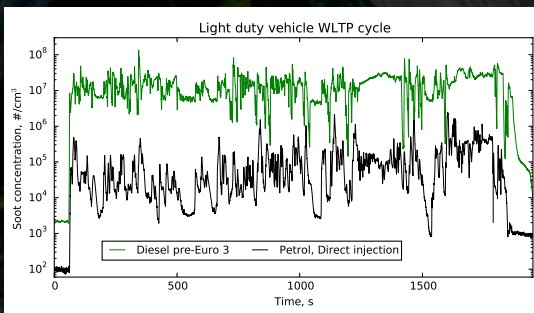
Proprietary and patented Pegasor sensor technology comprises diffusion charging with escaping current technology (extended diffusion charging, ExtDC)

Electrical measurement of particles has sufficient measurement range and sensitivity to support direct exhaust measurement. Dynamic range is also sufficient to cover air quality measurements.

Unique particle size detection with Pegasor dynamic trap function assures compliance with current and future performance requirements.

Integrated VPR (Volatile particle removal) and heated sensor provides several benefits that result in reliability and simple construction. Sample dilution is not needed.

Pegasor sensor technology is widely adopted by leading automotive & engine developers and has been subject to numerous scientific publications.



Pegasor G2 sensor used in GDI engine and pre-Euro3 diesel engine measurements demonstrates the wide dynamic measurement range and capability of the measurement technology.

EASE OF OEM INTEGRATION SENSOR

Pregasor G2 sensor has been specifically designed for easy OEM integration. Sensor can be widely adopted to different measurement needs. Required external components are inexpensive and system design is straightforward. Specific requirements for data acquisition can be flexibly met. (see detailed system description, next page)

G2 sensor meets the measurement requirements including the range and sensitivity, as well as hydrocarbon evaporation. The sensor supports dynamic trap sequencing function to fulfill the detection efficiency requirements today - and also for the future.

RELIABLE PN MONITORING

FOR INDUSTRIAL USERS

G2 sensor meets harsh industrial requirements for the use. There are no fragile parts or consumables and the sensor is insensitive to vibrations.

Measurement system does not require frequent attention or care from the user. Re-calibration is not needed and user does not need to play with flammable liquids. Annual downtime and cost of operation is minimal.

With direct measurement of raw exhaust uncertainties stemming from the complex and costly sampling system can be fully avoided.

Sensor also provides extensive self diagnostics for the user to secure reliable monitoring and data through use.



PPS-G2 sensor is designed to provide the sensing element e.g. for upcoming PN-PTI measurement devices.

As part of Capelec CAP-3070, Pegasor G2 is already NMI approved for the Dutch PN-PTI markets.

KEY FEATURES

- Direct measurement
- No dilution required
- Integrated VPR
- Flow-through design - no glogging
- Fast response time
- Simple and robust structure
- Low need of maintenance
- Easy OEM integration

TECHNICAL SPECIFICATIONS:

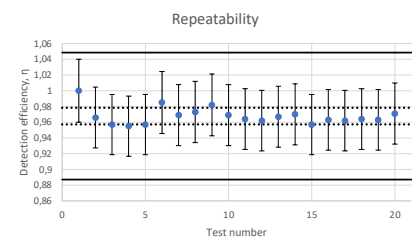
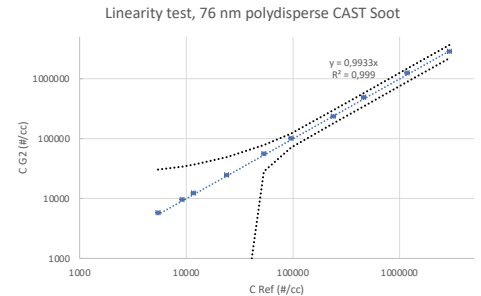
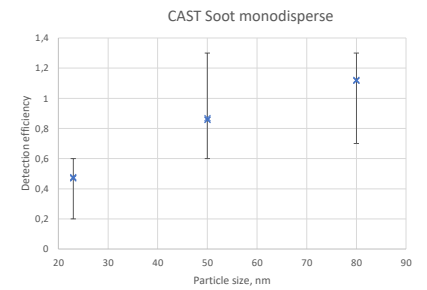
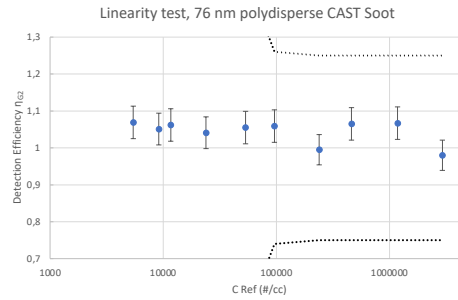
Concentration range:	1000 - 50 000 000 #/cm ³
Particle size range:	10 -300nm
Response time:	0.2s
Sample flow rate:	5.5 lpm
Data rate:	1-100Hz
Communication protocol:	serial
Sensor power:	5V DC
Heater	230V or 12/24V

G2 MEASUREMENT PERFORMANCE

PN measurement compliance testing has been conducted by independent laboratory Metas (SUI).

Metas conformity assesment:
Test Report No 235-11079)

Test	Criteria	Pass
Particle size; 2, 2.4.8	23 nm: $0.2 < CR < 0.6$ 50 nm: $0.6 < CE < 1.3$ 80 nm: $0.7 < CE < 1.3$	Yes Yes Yes
Linearity; Part 2, 2.1	MPE (Maximum permissible error): $\pm 2.5e4 \text{ cm}^{-3}$ or $\pm 25\%$ of reference value, whichever is greater	Yes
Repeatability; Part 1, 5.11	MPE standard deviation: 1/3 of the modulus of the MPE	Yes



SYSTEM REQUIREMENTS:

G2 sensor provides:

- Particle number (PN) count
- Sample pumping
- Volatile particle removal (VPR)
- Thermal insulator
- Heater (230V or 12/24V)
- Sensor diagnostics, including;**
 - Pump air T, RH, P
 - Ambient Pressure
 - VPR thermocouple
 - Corona, trap electronics, insulators
 - Maintenance counter

Sensor dimensions:

230mm x 110mm x 90mm.
(260x120x120mm with insulator mantle)

Weight: 1800g (with insulator mantle)

Air requirement:

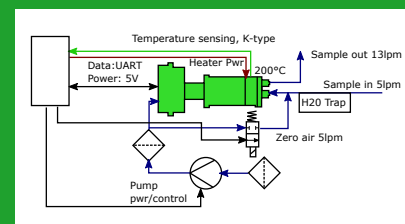
8lpm at 300mbar during measurement delivered with 6mm silicone-free tubing.

Sample inlet and outlet:

8mm od / 6mm id conductive tubings

External requirements:

- Filtered air, <8lpm@300mbar at operation (+possible zero air margin)
- Heater control
- Sensor power + data channel
- Sampling lines
- Zero air valve (or HEPA)
- Sample temperature, flow and moisture (if required)



Example of G2 integration to competitive PN-PTI system. For air quality monitoring application heating requirements are relaxed.

pegasor

sales@pegasor.fi | +358 10 423 7370

Hatanpään valtatie 34 c, 33100 Tampere, FINLAND