

Seta AvCount2 Laser Particle Counter

ASTM D7619; ASTM D975; Defence Standard 91-86; Defence Standard 91-91; IP 565; IP PM FA

AS 4059; ASTM D7647; GB 5930; GJB 420-1987; GJB 420-A-1996; GJB 4208-2006; GOST 17216; ISO 4406:1991; ISO 4406:1999; NAS 1638; SAE A6D; SAE 749D



- Cumulative & distributive particle numbers
- Particle count and cleanliness code
- Precise & reliable results
- Portable
- Colour touch screen

Particulates in Jet Fuel

Sediment contamination originates from tanks, pipelines, hoses, pumps, people and even the environment. The most common particulates that have potential to contaminate aviation fuels are rust, paint, metal, rubber, dust and sand. For quality control purposes sediment is classified by particle size.

Why is measurement so important?

Particle content can have an impact on the efficiency of the fuel distribution system from refinery to the wing tip. Monitoring the particulate content allows prediction of the filter and coalescer element blockage.

Small particles of sediment present in jet fuel can agglomerate to form scales that may affect or wear nozzles and ducts within the engine; in addition particulate contamination in the fuel may affect the quality of spray produced by the fuel injection system reducing combustion efficiencies. It is therefore important to identify and remove particulate before the fuel is pumped onto an aircraft.

Industry Specifications

IP 565

The laser based Particle Count test for aviation fuels (IP 565) was introduced to replace the traditional filtration test (IP 423/ASTM D5452) in 2008.

The inclusion of the laser particle test was as a result of the Aviation industry's ongoing efforts to enhance fuel quality and safety, increase engine reliability and reduce maintenance costs.

IP 565 which is included in DEF STAN 91-91, provided fuel suppliers and engine manufacturers with a more objective, quantitative assessment of the cleanliness of aviation fuel than had previously been practical.

Testing using laser based technology in accordance with IP 565 can be achieved using the Seta AvCount.

DEF STAN 91-91

The current DEF STAN 91-91 specifies a contamination limit of 1mg/l at point of manufacture. With the introduction of IP 565, a reporting requirement is now included at point of manufacture for individual channel counts and ISO codes.



Who should use AvCount?

- Refinery fuel quality
- Laboratory personnel
- Aviation fuel QA personnel
- Fuel suppliers
- Fuel filter maintenance personnel

How does IP 565 differ from other testing?

Alternative testing methods include filtration tests in accordance with IP 423 or ASTM D5452 to determine particulate contamination at point of manufacture.

Field based testing is based around the traditional 'clear & bright' or the 'line sampling method' (IP 216 or ASTM D2276). 'Clear & bright' is a simple visual test but can be time consuming and very subjective and is limited by the ability of the human eye to only detect particles greater than 40 microns.

Laser based testing in accordance with IP 565 provides users with a simple and precise, non subjective test. Particle detection ranges exceed 40 microns and therefore provides a more expanded range than traditional methods.

Applications

- Aviation turbine fuels (Jet A/A1 & AVGAS)
- Heating oil, gas Oil
- Diesel - automotive & marine
- Biofuels & biofuel blends
- Hydraulic and lubricating oil
- Gasolines & kerosine



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AvCount2 is a laser based particle analyser used for determining the particle concentration in liquid fuels and oils. It can be used throughout the distribution network and in the laboratory. In fact anywhere that requires accurate determination of particle distribution in a liquid sample. Whether checking the quality of fuel, filter systems, hydraulic fluids or in service lubricants, AvCount2 provides fast and precise results.

Key Features

- Particle size ISO 11171;
- Cumulative & distributive particle counts
- Particle count and cleanliness code reporting
- Uses 'straight from the bottle' samples
- Precise & reliable results
- Rugged case suitable for laboratory or portable use
- Typical test time of less than 5 minutes
- 15 fixed measuring channels
- An upper and lower limit value can be set for each of the first 8 counting channels
- Data storage for up to 2300 measurements across 64 memories
- Internal double pump system downstream of measurement cell
- Optional in-line high pressure testing up to 315 Bar

Principles of Operation

AvCount2 is fully automatic once the particle count test sequence has started.

The instrument flushes the cell with sample prior to commencing the measurements.

The flushing/sample analysing sequences are automatically repeated in accordance with the selected test method.

Results are displayed on the LCD screen in real time and printed out on the integral printer as the test progresses.

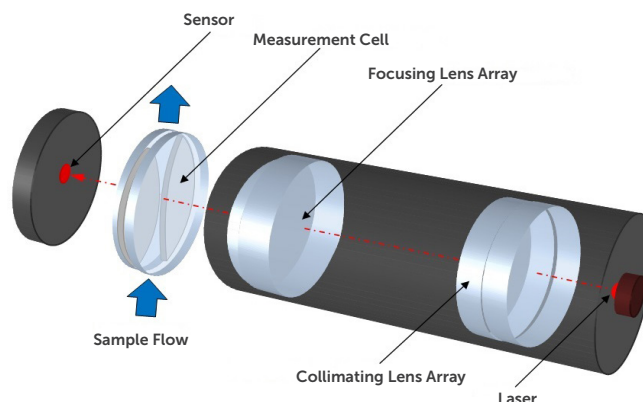
The results are shown for 6 particle size bands in Particles/ml and ISO Code.

Results can be saved to memory for trend analysis of samples, printed out on the integral printer or downloaded to a PC or external printer.



Laser Particle Count

Laser particle counting uses the light emitted by a laser to illuminate a cell through which the sample is passed. Particles present in the sample cast a shadow onto the sensor within the cell and as the particle passes across the cell the voltage output of the sensor drops. The voltage drop is proportional to the area of the shadow. AvCount2 calculates the size of the particle as the diameter of a circle of equivalent area.



Calibration & Verification

AvCount2 utilises 16 point calibration and results are easily verified/ recalibrated using NIST traceable standard solutions. Calibration can be checked at a user site or at our authorised regional laboratories.

Users are also able to verify their AvCount2 using the AvCount Verification Fluid (SA1006-0). The material is a suspension of a NIST traceable medium test dust in a super-clean clear, mineral based, technical oil.

AvCount Instrument Options

AvCount2:	SA1000-2	Suitable for users testing a range of middle distillate fuels or wishing to use multiple test methods.
AvCount2 Skydrol:	SA1250-2	Designed for use with Skydrol Hydraulic fluid. due to the highly corrosive nature of this material the AvCount is fitted with Isolast seals and a protective inner case

Technical Specification

	AvCount2 (SA1000-2)
Particle size range:	ISO 11171: 4µm(c) to >200µm(c); ISO 4402: 2µm to >100µm; GOST 17216-71: 2µm to >200µm
Measuring Channels:	15
Sample Viscosity (max):	68mm ² /s (from sample bottle) 200mm ² /s (@ 10 bBarG)
Sample Temperature Range:	0 to 80°C
Test Duration (IP 565):	Less than 6 minutes
Size bands reported during test:	As specified in Test Method
Size bands reported on recall:	All channels
Results:	Particles/ml or Particles/10ml (Test Method dependant) Cumulative & distributive cleanliness codes, cumulative or distributive (Test Method dependant)
Cell volume @ flow rate:	10ml @ 30ml/min
Total sample volume used (typ):	80ml (includes rinse cycles) for IP 565 & ASTM D7619 20ml other methods
Voltage / Power:	100/230 Vac, 50/60Hz, max 30W or 24 Vdc
Size (HxWxD) / Weight:	24 x 33 x 24cm / 12kg