

## Occupational Health and Safety Measurements

- Real-time monitoring of particle size distribution and concentration
- Detailed gravimetric size distribution and chemical analysis
- PM10, PM2.5, PM1.0 measurements
- High sample flow rate particle size distribution analysis



Excellence in Particle Measurements





## Occupational Health and Safety

Interest in health effects and risks associated with work has been growing in recent years as people spend a large part of their day in a workplace. Fine and ultrafine particles have been linked to health effects already decades ago and since different kinds of fine and ultrafine particle sources exist in workplaces, interest in characterizing these particles is increasing. Personal exposure to particles in workplaces depends largely on the nature and type of work in addition to any protective equipment worn. As the concentration of these particles may change significantly during different times of the day, measurements should be made in real-time to understand and assess personal exposure in greater detail. Particles in the workplace may also possess certain specific characteristics related to their size and/or composition that may be directly linked to toxicity. It is therefore important to characterize and understand these workplace aerosol properties in more detail through measurements of particle number concentration, surface area, size and composition.



## Dekati® Solutions

Dekati Ltd. has provided high quality instrumentation for fine particle measurements successfully for over 20 years. Our measurement solutions for workplace measurements include both air quality monitoring and research instruments. All our instruments are designed and manufactured in Finland with strict quality requirements and provided with a standard two year warranty.

### Dekati® particle measurement solutions for occupational health and safety measurements include:

- Real-time particle size distribution and concentration measurement with additional option for chemical analysis of the size classified particles
- Detailed gravimetric and chemical size distribution analysis
- High sample flow rate gravimetric sampling
- PM10, P2.5 and PM1.0 measurements
- Measurement of aerodynamic particle sizes, the metric used in measurement standards and determination of lung deposition of particles

Each and every Dekati® Instrument is thoroughly tested with traceably calibrated flow, pressure, temperature, voltage, current and particle measurements. Additionally, all Dekati® Instruments go through rigorous type-approval tests, including instrument response tests for changes in temperature, pressure and humidity. The robustness of our instruments is guaranteed through misuse tests making sure that the instruments are ready for any environment. These procedures ensure that every instrument shipped operates according to their specifications and the measurement data is reliable and reproducible.

### Dekati® Instruments

- All units original Dekati® design
- Over 20 years of experience in aerosol instrumentation
- All units manufactured and calibrated in Finland
- All units individually calibrated
- Provided with two year warranty
- Robust structure designed for use in field conditions
- Software and data processing spread sheet always included



## Dekati® Calibration Services

Dekati provides detailed and accurate calibration and maintenance services for all Dekati® Products. Our instrument calibration services include:

- Arrival inspection of the instrument in its arrival condition
- Cleaning and overhauling of the instrument
- Change of seals, filters and other aging parts
- Adjustment of electronics (if any)
- Calibration of the instrument
- Final operation and/or reference test
- Detailed report on the service
- New calibration data sheets





Dekati® ELPI®+



The ELPI®+ measurement setup for workplace measurements is both straightforward and simple requiring only a vacuum pump, also available from Dekati Ltd. If the sample is taken near an industrial process with high sample temperature or temporarily high particle concentrations, a dilution system can be applied at the ELPI®+ inlet. Dekati offers a broad range of dilution options including the Dekati® Diluter which is a widely used and recognised choice for many different environments and processes. Alternatively the High Temperature ELPI®+ can be used to sample hot aerosol directly into the ELPI®+.

## Real-time Size Distribution and Concentration

Dekati® ELPI®+'s wide particle size range makes it an ideal instrument for measuring both ambient workplace air quality as well as particles generated locally in an industrial process. The ELPI®+ gives information on several aspects of the aerosol including particle number, mass and surface area in different size fractions. ELPI®+'s unique feature to allow chemical analysis of the size classified particles after the real-time measurement is commonly used to identify the source and composition of the airborne particles in the workplace. Since the ELPI®+ gives real-time information on the size distribution of the particles it allows immediate analysis of particles and particle sources in different areas of the workplace.

## ELPI®+ Features

- Real-time particle size distribution and concentration measurement 6 nm – 10 µm
- Particle number, mass and surface area concentration measurement
- 10 Hz sampling rate for immediate and detailed detection of both short and long time-scale changes in the particle concentration and size distribution
- Wide operational concentration range allows ambient workplace air measurements as well as direct measurements from a local particle source e.g. point of welding or soldering
- Possibility for chemical and SEM/TEM analysis of size classified particles
- Fully functional standalone operation suitable for long term monitoring
- Together with Dekati® Sample Conditioning instruments, the ELPI®+ can be used to sample directly from any industrial process
- High Temperature ELPI®+ available for direct sampling of high temperature aerosols



## Particle Mass Size Distribution

DLPI+ (Dekati® Low Pressure Impactor) is a widely used and well characterized cascade impactor for detailed particle size distribution analysis. This impactor gives information on particle size distribution in 14 size fractions 16 nm – 10 µm. The size classified particles can be collected on different material substrates, such as aluminium or polycarbonate, for either gravimetric or chemical analysis. The DLPI+'s robust construction makes it a reliable choice even for long term monitoring in different environments.

Each individual DLPI+ impactor unit is calibrated for exact flow rate and impactor stage cut points to ensure accuracy of the measured data. The DLPI+ design is the same as in the impactor used in the ELPI®+ (Electrical Low Pressure Impactor) enabling an easy upgrade from DLPI+ into a full ELPI®+ system for real-time particle size distribution measurements.

## DLPI+ Features

- Wide particle size range; 16 nm – 10 µm
- Particle size distribution in 14 size fractions
- 10 lpm sample flow rate, Classic DLPI available for 30 lpm
- Integrated impactor low pressure measurement and adjustment
- Gravimetric, chemical, SEM/TEM analysis of size classified particles
- Stainless steel stages for operation even in harsh environments
- Sampling from up to 180 °C with High Temperature DLPI+
- Excellent calibration data
- Can be upgraded into a full ELPI®+ system for real-time data
- Complete measurement solutions for different types of measurement applications available from Dekati Ltd.

Dekati®  
Low Pressure  
Impactor  
DLPI+



## DLPI+ Setup

- DLPI+ Impactor
- Vacuum pump, no additional flow control needed
- PM10 inlet





## High Sample Flow Rate Size Distribution Analysis

DGI-1570 (Dekati® Gravimetric Impactor) is a high sample flow rate cascade impactor designed for measuring gravimetric particle size distribution of particles  $< 2.5 \mu\text{m}$ . In a standard DGI setup particles are size classified into 5 size fractions with impactor stage cutpoints of 2.5, 1.0, 0.5 and  $0.2 \mu\text{m}$ . If detailed information on the size distribution is not needed, the versatility of the DGI-1570 allows removal of some impactor stages from the DGI assembly. The nominal sample flow rate through the DGI is 70 lpm enabling high sample yield even during short measurement periods and in low concentration areas such as workplaces.

## DGI Features

- Particle size distribution in five size fractions  $< 2.5 \mu\text{m}$
- High sample flow rate: each unit is calibrated for 50, 60, 70, 80, 90 and 100 lpm
- Gravimetric, chemical or SEM/TEM analysis of size classified particles
- Robust stainless steel construction
- Complete measurement solutions available from Dekati Ltd.



*Dekati® DGI*

## PM10, 2.5. and 1.0

Dekati® PM10 Impactor is an ideal tool to measure PM10, PM2.5 and PM1 mass concentrations both in outdoor and indoor air. The Dekati® PM10 Impactor size classifies and collects different sized particles on filters analyzed after the measurement for gravimetric mass size distribution and/or chemical composition. The unit is manufactured from stainless steel to ensure reliable operation in long term use and even in harsh environments. Aluminium or polycarbonate substrates can be used on the impactor stages as a particle collection surface depending on the preferred particle analysis method. The required sample collection times depend on the PM levels in the air and the sensitivity of the particle analysis method. Typical sampling times range from approximately 1 to 7 days.



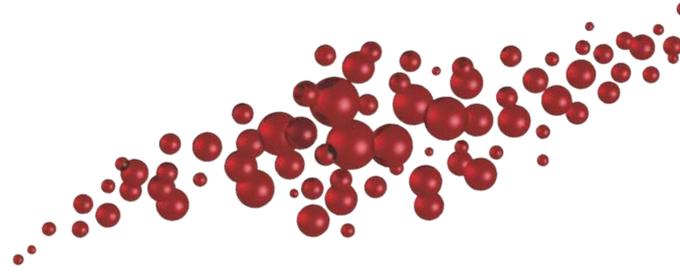
*Dekati® PM10 Impactor*

## Dekati® PM10 Impactor Features

- PM10, PM2.5 and PM1.0 detection
- Gravimetric, chemical or SEM/TEM analysis of size classified particles
- 10 and 30 lpm flow rate versions available
- Robust stainless steel construction
- Can be heated up to 200 °C
- Complete measurement solutions available for different applications
- Calibrated with aluminium and quartz fiber filters

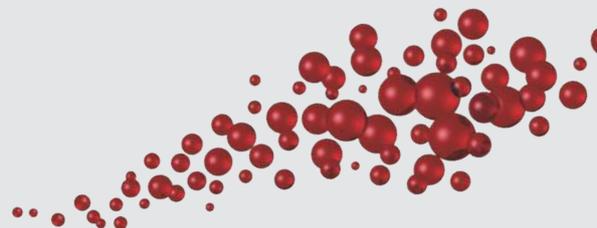
## Dekati® PM10 Impactor Setup

- Dekati® PM10 Impactor
- Pump with flow control



	Dekati® ELPI®+	Dekati® High Resolution ELPI®+	Dekati® DLPI+	Dekati® PM10	Dekati® DGI
<b>Size range</b>	6 nm – 10 µm	6 nm – 10 µm	16 nm – 10 µm	<10 µm	<2.5 µm
<b>Number of size fractions</b>	14	100 or 500	14	3	4
<b>Analysis</b>	Real-time, 10 Hz (also option for gravimetric)	Real-time, 1 Hz (also option for gravimetric)	Gravimetric	Gravimetric	Gravimetric
<b>Option for chemical analysis</b>	Yes	Yes	Yes	Yes	Yes
<b>Sample flow rate</b>	10 lpm	10 lpm	10 lpm*	10 or 30 lpm	50-100 lpm

\* Classic DLPI available with 30 lpm sample flow rate



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Dekati Ltd. is specialized in the design and manufacture of innovative fine particle measuring and sampling devices. Since its founding in 1993, Dekati has become the technological market leader in producing high-class fine particle measurement instrumentation for various applications and thousands of customers.

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Excellence in Particle Measurements



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