DEKATI

Excellence in Particle Measurements

Dekati® eDiluter™
eDiluter™ Pro
eDiluter™ Pro 1200C

Portable sample conditioning and dilution system

Certified VPR for exhaust and non-exhaust measurements

Adjustable dilution temperature, sampling from up to 1200 °C

Adjustable dilution factor with automatic compensation for sample inlet pressure fluctuations

Optional integrated catalytic stripper and PCRF calibration

Dekati®
eDiluter™ & eDiluter™ Pro

Description

The Dekati® eDiluter™ is a portable dilution system that allows easy sample conditioning for a wide range of particle measurement applications. Its compact structure includes a two-stage dilution system. Each stage has an adjustable dilution factor ranging from 1:5 to 1:30, giving a total dilution factor range between 1:25 and 1:900. Diluted sample can also be extracted directly after the first dilution stage.

The dilution factor of the Dekati® eDiluter™ is fixed at factory, whereas the Dekati® eDiluter™ Pro models have an adjustable dilution factor that can be easily changed by the user.

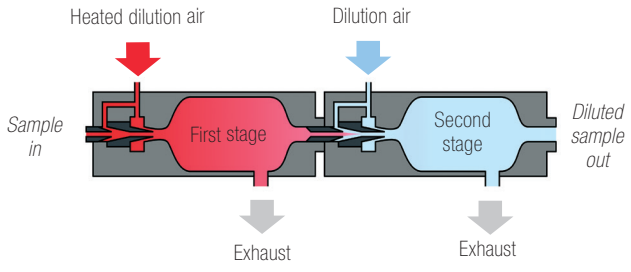
The Dekati® eDiluter™ is especially suitable for high temperature aerosol measurements with adjustable first dilution stage temperature and two additional temperature controllers for external heaters such as heated sampling lines and heated probes, also available from Dekati Ltd.

The dilution factor, dilution temperature and external heaters are all controlled via the front panel user interface where different dilution parameters can also be monitored during the measurement. The diluted sample output flow from the system is more than 50 lpm and it can be used as a dilution and conditioning system for all commercially available particle measurement instruments since the diluted sample is in stable ambient temperature and pressure.

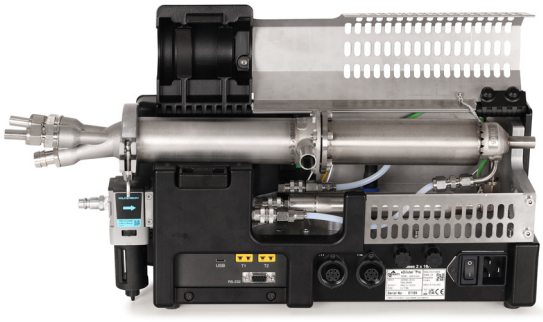
Operating principle

The operating principle of all Dekati® eDiluter™ models is based on two-stage dilution. The first stage is usually heated while the second dilution stage operates at room temperature, allowing the aerosol sample to cool down in a controlled manner. Both dilution stages consist of an ejector diluter with additional sheath air flow. The use of a large ejector nozzle and sheath air minimizes particle losses within the system and therefore reduces the need for cleaning the diluters.

The dilution factor in the eDiluter™ Pro is adjusted by changing the pressure of the dilution air. Furthermore, the eDiluter™ Pro models feature an innovative system that actively compensates the effects

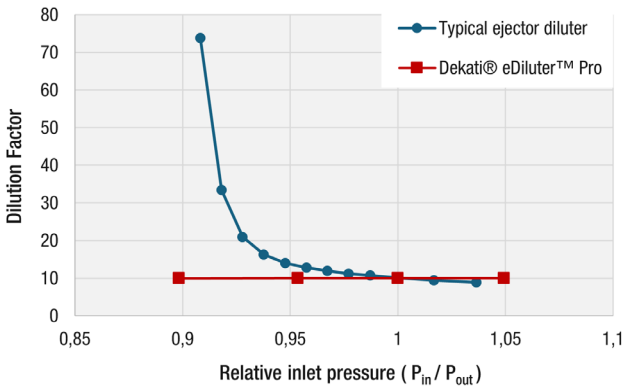


Operating principle of the Dekati® eDiluter™, showing the two dilution stages.



The two dilution stages of the Dekati® eDiluter™

of sample (inlet) pressure fluctuations on the dilution factor. Built-in sensors constantly monitor the dilution parameters including the inlet pressure, and the pressure of the dilution air is continuously and automatically adjusted to maintain constant dilution factor under all conditions. All these features guarantee repeatable and reliable measurement results even in variable sample conditions.

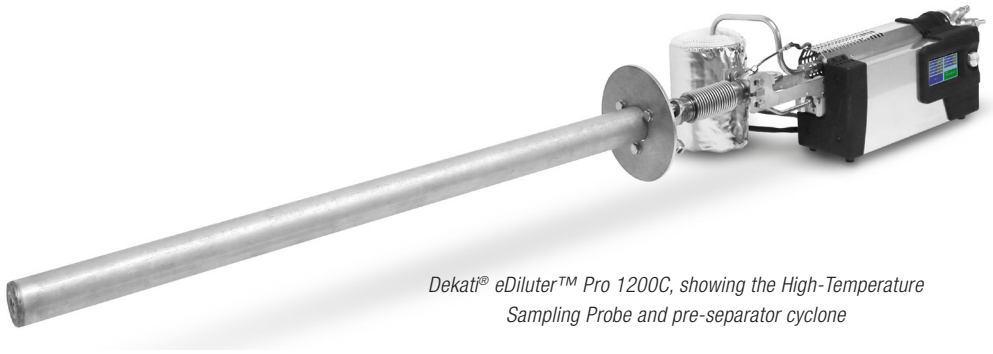


The dilution factor of the stages of the Dekati® eDiluter™ Pro remain constant in variable inlet pressure conditions.

Measurement applications

The Dekati® eDiluter™ is a flexible dilution system and with different accessories it can be used to dilute aerosol sample from practically any source. Typical applications for the Dekati® eDiluter™ Pro include:

- Stationary source emission measurements
- On- and Off-road engine emission measurements
- Brake and tyre wear emission measurements
- Blow-by gas emission measurements
- Aircraft turbine emission measurements
- Ship emission measurements



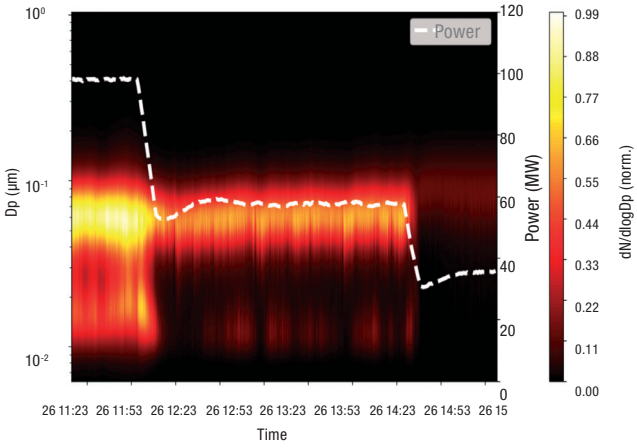
Dekati® eDiluter™ Pro 1200C, showing the High-Temperature Sampling Probe and pre-separator cyclone

Dekati®
eDiluter™ Pro 1200C

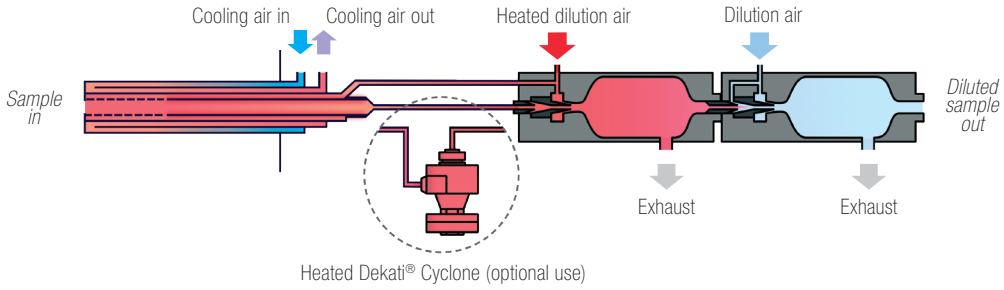
The Dekati® eDiluter™ Pro 1200C is a modified version of the eDiluter™ Pro dilution system specifically designed for particle measurements from extreme temperatures such as measurements directly from a combustion zone or flame.

The Dekati® High Temperature Sampling Probe is a heated dilution probe connected in front of the eDiluter™ Pro to take the sample from the high temperature source. The active cooling system built into the probe allows measurements from up to 1200 °C and direct aerosol sampling from a combustion zone or a flame. The High Temperature Probe includes a dilution stage where the sample is rapidly cooled to about 400 °C and a heated section to maintain stable sample conditions.

To minimize particle losses within the probe, the sample is diluted inside a porous type diluter where dilution air is introduced into the sample stream through small pores on the sample line walls.
The dilution air to the High Temperature Sampling Probe as well as the temperature of the probe are controlled via the eDiluter™ Pro unit that is connected at the outlet of the probe to further dilute the sample. An additional pre-separator cyclone is included in the setup and it can be installed between the High Temperature Probe and the eDiluter™ Pro to remove excess large particles from the sample.



HR-ELPI ®+ measurement results from a wood-pellet fired biomass powerplant with different power settings. Samples were taken directly after the combustion zone with sample temperatures ranging between 800-900 °C.



Operating principle of the Dekati® High Temperature Sampling Probe in connection with eDiluter™ Pro dilution stages

Model range overview

	Dekati® eDiluter™	Dekati® eDiluter™ Pro	Dekati® eDiluter™ Pro 1200C
Dilution factor range	1:25 - 1:900, Fixed at factory	1:25 - 1:900, Adjustable	1:25 - 1:900, Adjustable
Max. sample temperature	600 °C	600 °C	1200 °C
Inlet pressure compensation	No	Yes, active compensation control	Yes, active compensation control
Sampling line	Heated sampling line (option)	Heated sampling line (option)	253MA heat-resistant alloy steel Dekati® High-Temperature Sampling Probe with integrated heated Dekati® Cyclone pre-separator

Dekati® eDiluter™ / eDiluter™ Pro / eDiluter™ Pro 1200C

Specifications

Dilution factor	• 1:5 - 1:30 (single dilution stage) • 1:25 - 1:900 after both dilution stages
Max. sample inlet pressure	1.5 bar abs
Sample inlet/outlet pressure ratio	Min. 0.90
Max. sample temperature (inlet)	• 600 ºC (eDiluter™/ eDiluter™ Pro) • 1200 ºC (eDiluter™ Pro 1200C)
Sample flow rate (inlet)	~2 - 10 lpm, depending on the dilution factor
Diluted sample flow rate (outlet)	50 - 80 lpm
Heated stage dilution air temperature	Adjustable, up to 450 ºC
Pressurized air requirements	• Cleaned and dried pressurized air • Min. 4.5 barg (gauge pressure) • Max 8.0 bar abs • 80 - 200 lpm (depending on dilution factor and sample pressure)
Power requirements	• 110 - 230 V • Max. 600 W with heated dilution • Max. 2.6 kW in case of connecting 2 external 230 V heaters • Max. 1.6 kW in case of connecting 2 external 110 V heaters
Dimensions	H205 x W168 x D520 mm
Weight	7.3 kg (without probe)
Dilution stage material	Stainless steel, AISI 316
High temperature sampling probe	• Heat resistant stainless steel 253MA • Probe length: 1 - 2 m (custom lengths up to 6 m) • Probe diameter: 60.3 mm • Probe flange diameter: 200 mm (custom flanges upon request)

Features

- Two-stage dilution system for particle measurement applications
- Stable dilution factor in variable sample pressure conditions. Sophisticated dilution stage design, optimized for minimal particle losses. Particle penetration >90% for particles below 200 nm
- Independently certified VPR (Volatile Particle Remover) according to UN/ECE-R83 (Rev.5), UN/ECE-R49 (Rev.6) 2017/1151 and 2017/1154 (RDE). Compliant with SAE AIR 6241 and UN GTR-24 with optional catalytic stripper element
- High diluted output sample flow, up to 80 lpm; Dilution factor not affected by the sample flow rate of the measurement instruments
- Built-in, integrated dilution air heater for first dilution stage
- Two additional, integrated temperature controllers for controlling temperatures of external heaters such as heated sampling lines and heated sampling probes
- Sampling from up to 10 bar possible with accessories
- Instrument control via integrated display user interface
- Data output via USB-C and RS-232 ports
- Provided with communication protocol that enables remote control via terminal software. Compatible with AK protocol.
- Each unit individually calibrated and provided with a calibration certificate. Optional PCRF calibration available upon request.

Accessories

- Pressurised air cleaning and drying units for dilution air
- Heated sampling lines, sampling probes and isokinetic sampling nozzles
- PM10 and PM2.5 sampling cyclones
- Dekati® High Pressure Diluter DEED-300 for sampling from up to 10 bar sample pressure
- Integrated catalytic stripper
- GTR-24 compliant sampling setup for brake wear emission measurements

The eDiluter™ can be directly connected to a heated sampling line.

For more information, please contact:
sales@dekati.com

DEKATI Since 1993

Dekati Ltd. is a world leader in designing and manufacturing innovative fine particle measurement solutions. We have more than 30 years of experience in providing measurement instruments and complete measurement solutions to a wide variety of environments and sample conditions. All Dekati® Products are developed and manufactured in Finland and are available with up to five-year warranty.

CERTIFIED ISO 9001 BUREAU VERITAS

07/2025