AROSA INSTRUMENTS

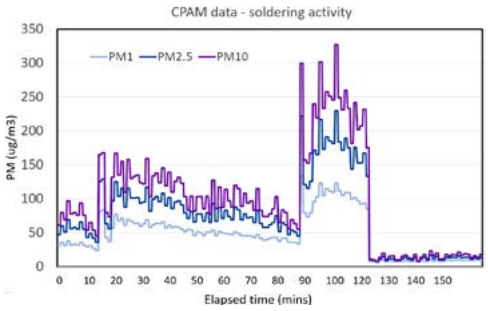
COMPACT PERSONAL AEROSOL MONITORS FOR WORKPLACE DUST

CPAM

Real-time capability integrated with compliance sampling

The CPAM monitor provides an innovative extension to the capability of standard personal samplers by including a real-time aerosol sensor to give instantaneous information on respirable dust levels as well as taking workplace dust exposure samples according to MDSH 14/4. The respirable dust levels are based on direct measurement PM1 and PM2.5, whilst PM4 and PM10 estimates are extrapolations based on typical aerosol profiles. The sensor can provide an instant indication of hotspots of dust exposure (alerted by flashing LEDS) and provide a download of the temporal record profile of dust exposure during a worker's day. This real-time data is therefore complementary to the compliance sample made by the same instrument and can help identify the periods of maximum exposure, thus helping to inform mitigation plans to minimise and control dust levels.

Figure : CPAM measuring PM1, PM2.5 and PM10 during a period of indoor electronics soldering activity.



Key features of CPAM for Real-time aerosol measurement and sampling

- Simultaneous Real-time OPC (optical particle counting) monitoring of dust and personal sampling of inhalable dust
- Compact design integrates sampling head, filter cartridge, real time optical sensor and pump in a single palm sized sampling unit (112g)
- Dust concentration (mg/m3) monitored in four particle size fractions (PM1, PM2.5, PM4, PM10)
- PC access to record of dust levels (10 second averages) and sampling data
- Instantaneous warning of hotspots during workplace surveys
- Personal sampling of inhalable dust according to HSE's requirements (MDSH 14/4)
- Attaches to an individual's lapel with no separate external pump/battery or tubing required, thus avoiding snag hazards.
- Convenient, unobtrusive and light-weight alternative to the traditional IOM sampler for the personal sampling of Inhalable dust

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Benefits of real time monitoring

The CPAM gives its wearer instantaneous information on the changing nature of their exposure, thus enabling that person to take evasive action to minimise their own dust exposure. This is of real value in cases where workers have a varied work pattern and their surroundings can change in terms of risk of exposure (eg demolition sites, or welding). No longer is it necessary to use separate hand-held dust survey monitors to understand the dynamics of dust levels to which a worker is exposed during a day. Instead, this information is recorded by the sampler together with data on sampling duration and sampling flowrate and may be transferred to a PC via mini-USB connection for full analysis and reporting.

REQUIREMENT	CPAM SPECIFICATION
Performance	Realtime monitoring of PM1. PM2.5, PM4 and PM10 Parallel sampling of inhalable dust according to HSE's MDSH 14/4
Total weight	112g
Size	97x44x44mm withcartridge fitted
Sample flow rate to filter	2 l/min +/- 2.5% with inbuilt-auto-adjustment
Flow rate calibration	With external flow meter. FIN adaptor also required for high pressure drop flow meters (please contact Arosa)
Sampling period	4 hours between recharge of removable Li ion battery Extended to 8 hours operation when intermittent PM measurements are made (20s in every minute)
Filter media	Removable Stainless Steel cartridge with 37mm HEPA suitable for gravimetric analysis or particulate content analysis
Data recording	PM1,PM2.5 & PM10 @ 10seconds for 8 hours Flow rate, battery level, sampling start and stop time

Arosa's license with Ploughshare Innovation ltd. for a range of aerosol monitors

Arosa Instruments Ltd has a license agreement from Ploughshare Innovations Ltd to intellectual property generated through a collaboration between Dstl, a part of the UK Ministry of Defence, and the University of Hertfordshire. This licence grants Arosa the rights to develop and manufacture a range of revolutionary aerosol instruments for **workplace exposure assessments** and **air quality studies** using DSTL's patented low flow impedance sampling technology.

- **The CPAS combines a sampling head, sample cartridge and airflow management system within an integrated package which is both light-weight and convenient to wear.**
- **In the CPAM personal monitor, this capability is extended by addition of a real-time aerosol measurement sensor to allow a temporal record of respirable dust mass concentrations (four separate particle sizes including PM2.5) over periods up to 8 hours.**