DUSTCANARY™

WEARABLES THAT DETECT

DUSTCANARY

Alarm Settings
Warn 0.40 mg/m³
High 1.00 mg/m³

DustCanary™ **TREND 420**
Personal real-time respirable dust detector

PROTECT YOUR STAFF
YOURSELF

Help **safeguard respiratory health** in the workplace

DustCanary **recognise the importance** of long-term real-time dust measurement, particularly where the **health and safety** of workers is at stake.
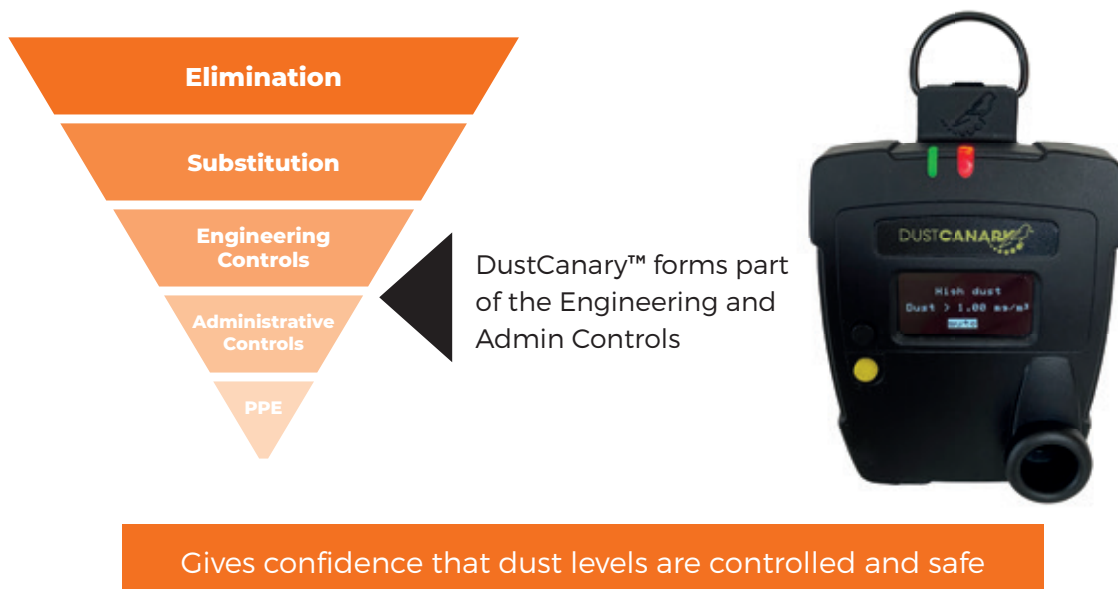
Airborne dust particles in the workplace pose **significant risks** to human health, and monitoring their levels is key to helping **prevent respiratory issues**, allergies, and occupational diseases.

Reduce respirable dust exposure risk – Support control measures

The hierarchy of controls methodology for reducing dust exposure focuses efforts on elimination and controls ahead of the use of PPE as the final option to protect against risks.

In well controlled workplaces, real-time qualitative and indicative respirable dust monitors can form part of the Engineering and Administrative Controls. Instant data availability demonstrates that these controls, including local exhaust ventilation (LEV), are working as designed and reduce the risk of an undetected incident which would otherwise increase worker exposure.

Elimination

Substitution

Engineering Controls

Administrative Controls

PPE

DustCanary™ forms part of the Engineering and Admin Controls

Gives confidence that dust levels are controlled and safe

Practical, continuous personal dust monitoring

The DustCanary™ **TREND 420** wearable dust detector provides **protection to workers** in industrial and construction settings from inadvertent exposure to respirable dust.

It provides visibility to the variability and hotspots of **dust exposure** and a record of the temporal record profile of dust exposure during a worker's day.

Instant **visual and audible alarms** alert when workers are exposed to increased respirable dust including respirable crystalline silica (RCS) so that action can be taken to **minimise exposure**.

Being compact, lightweight with no sampling tubes or waist worn pumps as catch hazards, the DustCanary™ **TREND 420** gives **continuous protection** without effecting worker productivity or work patterns.
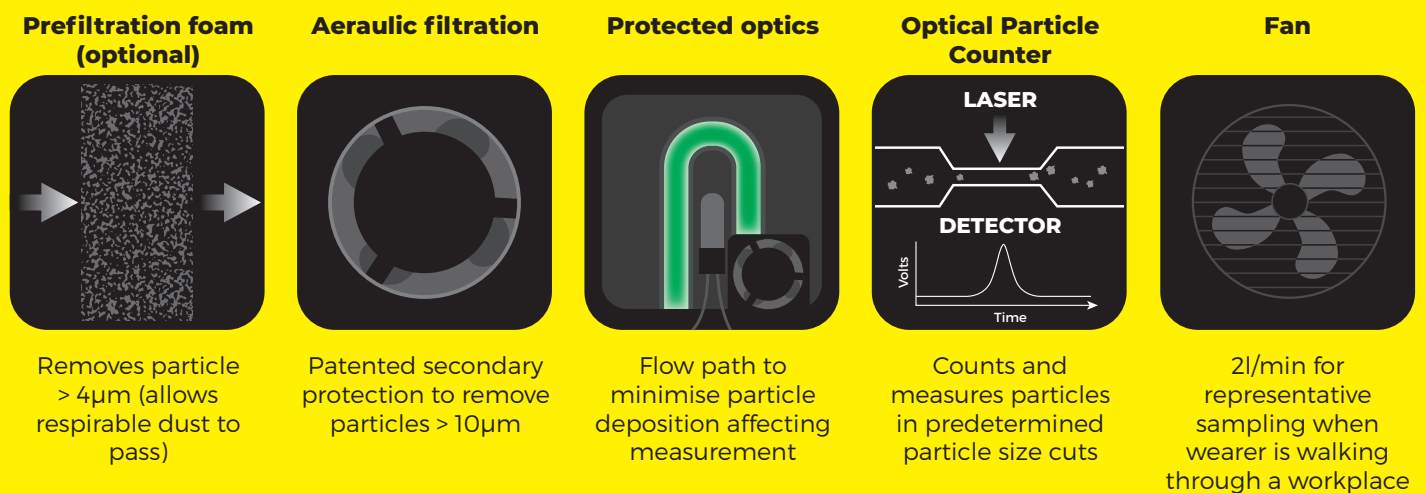
DustCanary™ **TREND 420** benefits

- Create visibility to changes in dust levels and dust hotspots to help minimise personal exposure

- Discover what is happening between periodic compliance dust sampling

- Empower employees to help manage risk around their dust exposure

- Support control measures by providing actionable alarms as soon as local exhaust ventilation (LEV) and other controls are not working adequately

- Protects wearers by warning them when to fit respiratory protection equipment or move away from a location with elevated dust levels

Advanced detection method

At the heart of the DustCanary™ **TREND 420** is the high quality **Next-PM** sensor module. The design has been optimised to provide **robust measurement** for workplace applications.

Prefiltration foam (optional)	Aeraulic filtration	Protected optics	Optical Particle Counter	Fan
Removes particle > 4µm (allows respirable dust to pass)	Patented secondary protection to remove particles > 10µm	Flow path to minimise particle deposition affecting measurement	Counts and measures particles in predetermined particle size cuts	2l/min for representative sampling when wearer is walking through a workplace

These innovations provide:

• A serviceable prefiltration option stage to remove particles larger than the respirable dust fraction and reduce dust contamination on optical surfaces

• Focused OPC measurement on a single size fraction (respirable dust) as a representative control and alarm activation measure while still having capability to measure multiple size fractions

• Wide dynamic range from 0.005 to 10mg/m^3

• Cumulative dust measurement to trigger sensor maintenance

• A configurable dust protection mode to protect sensor when exposed to elevated dust levels for extended periods of time

The dust sample is drawn into the DustCanary™ **TREND 420** through the front of the device which enhances representative dust measurement and is consistent from the Health and Safety Executive's guidance MDHS14/4 to be 'away from obstructions' (such as clothing).

2l/min flow from the front of the device for representative dust measurement

Protect from respirable dust across construction and industrial processes

Respirable Crystalline Silica (RCS)
In the construction and minerals industry, ensuring exposure to respirable crystalline silica (RCS) is minimised and below the long-term Workplace Exposure Limit (WEL) of 0.1 mg/m³, is a primary safety objective due to the carcinogenic classification of the crystalline particles. These particles are created when construction and industrial materials containing silica are fractured by drilling, cutting, sanding, abrasion or blasting.

The DustCanary™ **TREND 420** has the resolution to measure respirable dust to below 0.005 mg/m³. While not measuring RCS specifically, it provides a practical tool for alerting workers when there are dangers in overall respirable dust levels and when controls are no longer working as designed.

The DustCanary™ **TREND 420** is applicable to all types of respirable dust and has relevance to applications where dust must be minimised due to the carcinogenic or long-term health impacts of exposure to dust. These include industries with exposure risks from the following dusts and aerosols:

- Oil mist
- Bioaerosols
- Welding fumes
- Flour and food dusts
- Wood and MDF dusts
- Metallic dusts

Secure configuration and convenient reporting

The DustCanary browser application provides a responsive, fresh, secure and private web experience for reporting dust exposure profiles recorded by the DustCanary™ **TREND 420** wearable dust monitor.

The software makes it easy for Health and Safety professionals to connect a DustCanary wearable device to a PC in order to configure the audible and visual alarms, download recorded sessions of the dust profile and produce reports of respirable dust exposure vs time.
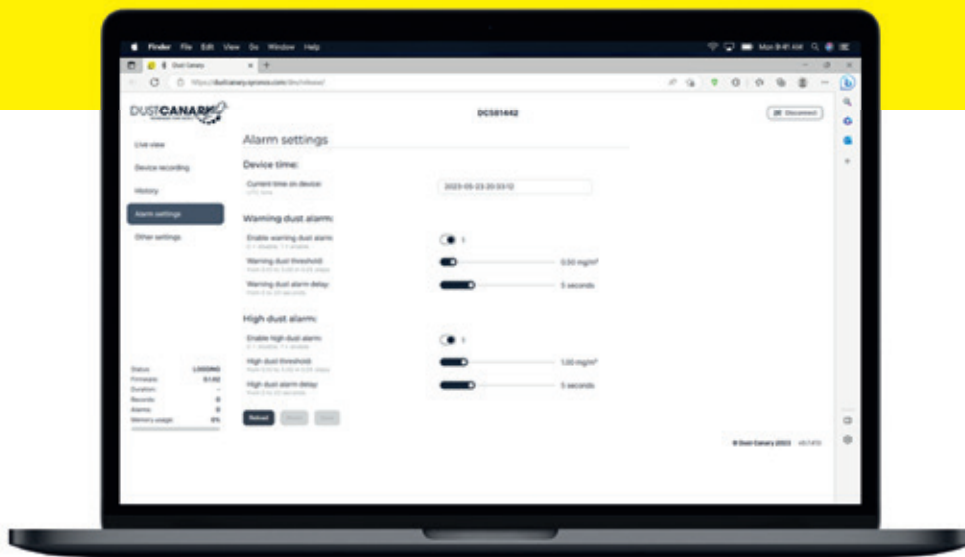
Bluetooth communication for wireless access to live data, alarms and dust logs

Graphs produce valuable insights to help diagnose the source of dust hotspots
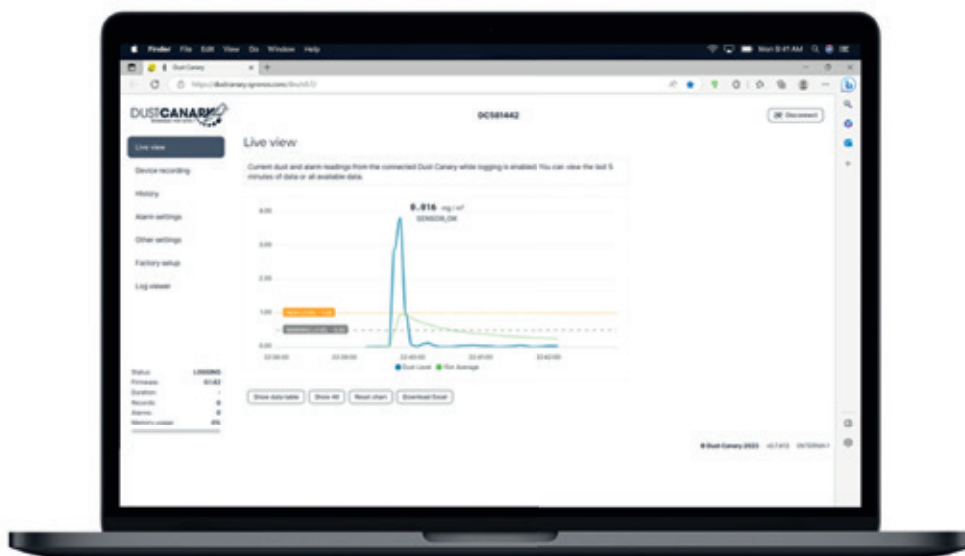
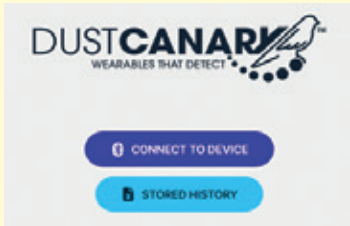**Once installed, can run 'off-line' – useful where internet access is not guaranteed**

App runs within a web browser – for enhanced IT security

Ongoing **Quality Assurance**

The instrument performs an **automatic self-check** cycle each time a monitoring session is started. In addition, the instrument **continuously monitors** for any changes in the Next PM (sensor module) error flags (flow rate, laser operation and valid reading) and alarms if any errors are detected.

For added **quality assurance**, users may perform a periodic response test with an externally applied test aerosol.

The sensor should be calibrated against a reference instrument once a year and provides an alarm/displayed message when this **calibration is due**. This service is provided by DustCanary or its service partners.

Specification/Function	Description/Performance
User interface	On instrument OLED display with scrollable menus for: • Current dust level (mg/m^3) • Battery level (%) and charge status (on recharge) • Alarm set points • Alarm condition • Bluetooth settings • Automatic self-check results Tilt switch to invert display when instrument viewed from above Visible LEDs and audible sounder to warn user of alarm conditions Browser app for configuration of device and alarm settings
Data recording	Recording of real time dusts levels (7 day capacity at recording interval of 1 second) Recording interval configurable from 1 second to 30 seconds Separate session of recorded data each time instrument is used (time stamped) Log of alarm events (time, type and alarm level)
External comms	Bluetooth wireless communication for connection to external devices Browser App for • Configuration • Live view of dust • Download and reporting of recorded sessions and alarms • Calculation of 15 minute and 8 hour average exposures Includes dashboard to chart data, summarise exposure by calendar day and produce external reports Supports export of results to external programs • XLXS for Microsoft Excel • CSV for NIOSH Evade (synchronises with video) • API for integration into Cloud reporting software

Specification/Function	Description/Performance
Measurement range	0.01 to 1mg/m^3 – Continuous qualitative monitoring of respirable dust 1 to 10mg/m^3 – Continuous indicative monitoring of respirable dust and configurable dust protection mode (intermittent measurements)
Real-time sensor	Next PM sensor module (OPC), with prefiltration and algorithm for Respirable dust Respirable dust reading updated every 1 second
Inlet sampling flow	2 liters per minute (permits representative measurement with moving wearer)
Concurrent functionality	Hi and warning dust alarms (can be enabled on or off) Dust Monitoring Automatic self-checks on sensor operation, hardware. and battery Data recording
Alarms	Hi dust alarm • Configurable alarm threshold of 0.1 to 5mg/m^3 • Configurable alarm delay of 1 to 30 seconds • Alarm can be enabled/disabled • RED visual LED (can be seen from top and front) • Audible alarm Warning dust level • Threshold and alarm delay can be configured • Yellow visual LED • Audible alarm Dust Protection Mode – intermittent mode on detecting elevated dust which can be overridden by wearer Non-conformance of automatic sensor checks on start of each new session Visual and Audible alarm (85dB at 10cm) on all alarm conditions
Ergonomics	Weight: 210g Size: 65 x 90 x 25mm plus external clothing clip with backup landyard loop Material: Polycarbonate
Rechargeable battery	IP44 Lithium Ion: 12.8 WHr. 3500mAHr capacity • 16 hour life between recharge (new) 12 hour life after 200 recharges • 3 hour recharge time with USB C cable (1Amp/hr)
Continuous operation	No time limit when powered permanently by USB C
Ambient conditions	-10 to 55°C (non-condensing)
Safety and EMC	CE and UKCA

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