

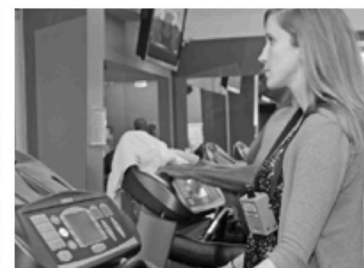
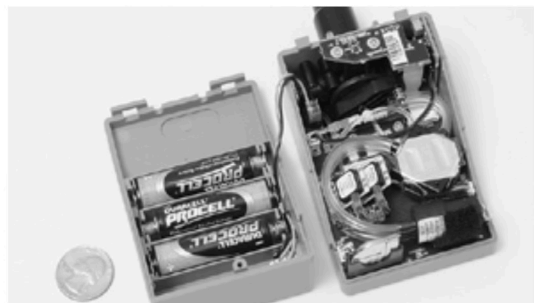
# MicroPEM™ Personal Exposure Monitor

DESKTOP INSTRUMENT PERFORMANCE IN A MINIATURIZED, WEARABLE FORM

RTI International's world-renowned research scientists in particulate matter (PM) detections have developed a personal PM exposure monitor—MicroPEM. MicroPEM is a significant advancement in personal PM exposure assessment that approaches analytical desktop instrument performance in a miniaturized, wearable form factor. An onboard pump fixes sample flow at a continuous rate, and interchangeable impactor stages provide PM<sub>2.5</sub> or PM<sub>10</sub> cut-points to match U.S. Environmental Protection Agency (EPA)–defined particle fractions. Particles are detected using a nephelometer, which records real-time PM concentration data at 1-second intervals. A user-replaceable filter is also available for sample collection, allowing gravimetric analysis and speciation studies of the collected sample. MicroPEM allows the real-time and gravimetric measurement of a person's exposure that is essential to understanding the causes of adverse health outcomes.

**MicroPEM is easy to use and produces reliable real-time data identifying PM exposure levels and patterns.**






**MicroPEM is small enough to be worn on an individual's body while performing different tasks. In addition, it can also monitor the person's activity levels via built-in accelerometers.**








## MICROPEM FEATURES

The MicroPEM offers 15 critical features in a single package that benefit occupational exposure assessment. The small, lightweight, quiet form factor does not interfere with job duties—thus enabling representative measurements of exposure for the entire work shift. The real-time PM exposure concentration and accelerometer data wirelessly transmitted to a worker provide instantaneous situational awareness of exposure risks in the workplace. The aggregation of MicroPEM data transmitted to a central computer provides a complete spatial-temporal map of PM exposures across the workplace.






### GENERAL FEATURES

<b>Lightweight</b>  Weighs < 240 g Wearable	<b>Battery Life</b>  48–176 hours Uses 3 AA batteries	<b>PM Breakpoints</b>  Three PM settings: PM <sub>10</sub> , PM <sub>4</sub> , PM <sub>2.5</sub>	<b>Temperature</b>  Works from -10°C to 35°C Humidity up to 90%	<b>Flow Control</b>  Stable flow control to 10 inches of H <sub>2</sub> O
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### PARTICLE DETECTION

<b>Dynamic Range</b>  Range of 1 mg/m <sup>3</sup> to 10,000 mg/m <sup>3</sup>	<b>Accuracy</b>  Accuracy greater than 90%	<b>Resolution</b>  1- second data resolution	<b>Precision</b>  Precision greater than 90%	<b>Speciation</b>  Particle speciation from integrated filter
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### DATA COMMUNICATIONS AND QUALITY

<b>Networking</b>  Connect multiple devices	<b>Accelerometry</b>  Integrated 3-axis accelerometer	<b>Location-aware</b>  Use external GPS or RF identification	<b>Wireless</b>  Wireless data transfer	<b>Software</b>  Software for set-up and data download
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## MORE INFORMATION

The MicroPEM has a broad range of potential applications involving real-time measurement of personal exposure levels and patterns.

RTI Commercialization invests in new technologies emerging across the research institute and facilitates industry partnerships to advance these technologies to the marketplace.

To explore partnership opportunities, contact [partner@rti.org](mailto:partner@rti.org).

RTI International is an independent, nonprofit research institute dedicated to improving the human condition. We combine scientific rigor and technical expertise in social and laboratory sciences, engineering, and international development to deliver solutions to the critical needs of clients worldwide.

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