

# NANOZETTE

*The official newsletter of Nanozen Industries*



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## ASSESSING TALC EXPOSURE RISKS

A peer-reviewed study published in October examined personal exposure to particles using real-time monitors. The study, supported by Health Canada and the Canadian National Research Council, explored the use and benefits of real-time direct monitoring devices for the characterization of airborne particulate emitted during application of cosmetic talc products. As reported in the International Journal of Environmental Research and Public Health authors Pat Rasmussen et al. set out to characterize the concentration, duration and particle size distribution of the talc cloud that forms in the personal breathing zone (PBZ) when certain cosmetic products were applied. Particle concentration and size distribution characterization was made possible by Nanozen's real-time personal wearable DustCount with a PM4 impactor as defined by NIOSH. The researchers also utilized laboratory particle instruments such as Aerodynamic Particle Sizer (TSP) as well as stationary monitors such as DustTrak DRX and DustTrak II aerosol monitors (TSP).

The study is packed with interesting findings. Rasmussen et al. identified gaps in prior studies which relied solely on gravimetric analysis such as particle size distribution of airborne talc particles. In addition, the authors noted analytical challenges posed by the short duration, and low concentration of particles produced during a single application of talcum powder in earlier studies.

The authors found the real-time personal samplers and area monitors used in their study were more sensitive and had a faster response time than previously available technologies. These advances permitted investigation into the changes in airborne particle concentrations over a short duration to capture short-term temporal variations in respirable particle concentrations (PM<sub>4</sub> in mg/m<sup>3</sup>) during talc application. The authors goal was to collect more samples, and at level of detail previously not possible, which would assist in the design of future exposure studies.



Dr. Rasmussen's exposure measurements utilized human subjects, specifically three adult volunteers. PM<sub>4</sub> concentrations were monitored at three distances from the face (0, 30 and 53 cm) during product application. Each subject wore a DustCount personal monitor (5s logging period) attached to a belt on their waist, and the unit was equipped with flexible graphite-impregnated silicon tubing to position the air intake between the subject's nose and ear. A DRX monitor was affixed in a stationary position 1.1 m above the floor and within 30 cm of the subject's face. Data obtained from Nanozen DustCount and TSI were tested and confirmed to be very similar.

The study concluded that as direct-reading monitors can capture short-term temporal variations, they are useful for augmenting filter-based approaches which require an extended sample collection period. Direct-reading measurement technologies are therefore recommended to assist in the evaluation of short duration inhalation exposures, required to address existing uncertainties in the evaluation of risk to talc exposure. By determining the particle size distribution of cosmetic talc products currently in-use, and by characterizing the duration and concentration of the talc cloud that forms during real-life application conditions, this pilot study provides additional information for the assessment of risk associated with inhalation exposures of powder-based cosmetics.

It was rewarding to have Nanozen's DustCount utilized in this study, and to see the authors wrapping up their report with :

*“As direct-reading monitors can capture short-term temporal variations, they are useful for augmenting filter-based approaches which require an extended sample collection period (to exceed detection limits of gravimetric analysis). Averaging measurements over a longer time period, than the actual duration of the talc cloud, can result in a significant underestimate of airborne talc concentrations. Direct-reading measurement technologies are, therefore, recommended to assist in the evaluation of short duration inhalation exposures, required to address existing uncertainties in the evaluation of risks to talc exposure.”*

The study is well worth reading. All monitors in this study were calibrated with Arizona road dust which is acceptable since Arizona Road dust density (2.5 – 2.7 g/cm<sup>3</sup>) is similar to the particle of study ; Talcum powder (2.6 to 2.9 g/cm<sup>3</sup>). In a future issue of Nanozette we will discuss the application and consequences of using Arizona road dust calibrated instruments to measure particles of interest which have very different density than the calibration dust.

A copy of the Dr. Rasmussen's study can be found [here](#).

## SAIOH ANNUAL CONFERENCE RECAP

South Africa is a vibrant and exciting country and Nanozen recently participated in the Southern African Institute for Occupational Hygiene's (SAIOH) annual conference. Held in the middle of October, the conference's theme was “Occupational Hygiene and the 4th Industrial Revolution”. Congratulations to the event organizers including Cas Badenhorst on a terrific event! The venue was beautiful, the educational sessions terrific and the event staff were exceptional!

Dr. Winnie Chu, Nanozen Founder and CTO, presented and Nanozen's DustCount® 9000 intrinsic-safe



Dr. Chu presenting to a packed audience at SAIOH

dust monitor was on display in our partner Sedulitas' booth. Winnie's speech began by quickly exploring the impact technology has had on other industries, and offered an entertaining look back at the evolution and pervasiveness of computing and communications technology advances over the past 100 years. Winnie then explored the state of aerosol monitoring practices and examined how the Industrial Internet of Things (IIoT) and real-time, direct reading monitors, with wireless connectivity and integrated sampling filters, were being used to maximize the accuracy of aerosol measurement and dramatically reduce assessment and remediation efforts. Her talk also compared and contrasted Optical Particle Counter (OPC) vs Photometer (Nephelometer) technology with a focus on accuracy and calibration requirements of the two technologies. Dr. Chu's speech was very well received and led to many interesting side conversations with industrial hygienist seeking to identify and mitigate high exposure scenarios. Please email [moreinfo@nanozen.com](mailto:moreinfo@nanozen.com) if you would like a copy of Winnie's presentation.

## PARTNER SPOTLIGHT - SEDULITAS

A strong ecosystem of partners is essential to help companies like Nanozen broadly reach into many markets and geographies. In this issue of Nanozette we highlight one of our oldest partners, **Sedulitas**.

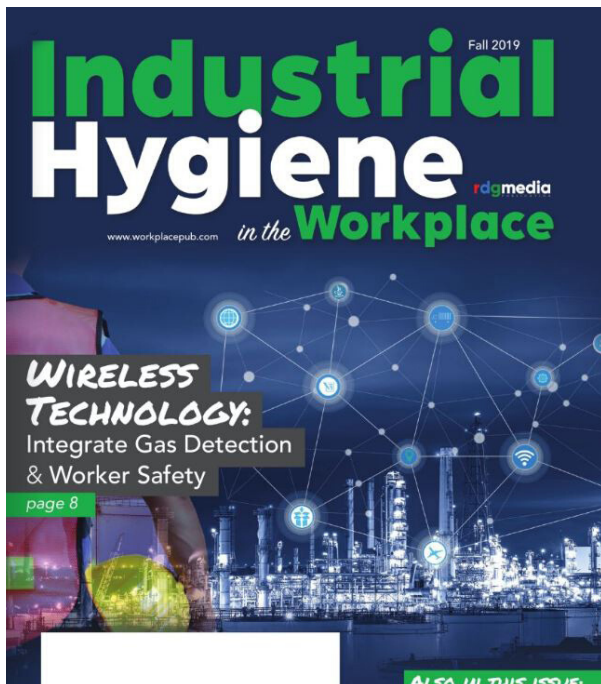
Based in South Africa Sedulitas provides innovative HSE solutions to improve their customers bottom line - with the view that a healthy worker is a productive, happy worker - and happy workers help to ensure long term business viability and sustainability.



Nanozen CEO Peter Briscoe at SAIOH 2019

Sedulitas, an authorized reseller of Nanozen's DustCount products also offers a wide range of other real-time monitoring instruments including radon gas detectors, wireless WBGT meters and temp/pressure/humidity data loggers, as well as sound level meters to name just a few. In addition to their products, Sedulitas offers a full range of services including exposure assessments, auditing and risk assessments. Founded in 2017 by Peter-John "Jakes" Jacobs who holds a Master of Public Health & Occupational Hygiene, and has been a practicing Industrial Hygienist for many years, Sedulitas is one of Nanozen's valued partners. Click [here](#) to learn more about Sedulitas.

# NEW MAGAZINE FOCUSED ON INDUSTRIAL HYGIENE



We are always on the look out for new industry resources to share with our friends and think this one is a winner. RDG Media, perhaps best know for their Workplace Material Handling and Safety Magazine, has just launched a new publication focused solely on Industrial Hygiene. The publication, aptly named "Industrial Hygiene in the Workplace" debuted in October and will run quarterly in 2020. The article entitled "Wireless Gas Meters" as well as "Evaluating Dust Hazards" were our favorites in this issue. Congratulations to Randy, Barbara and the whole team involved in this new and exciting publication. Visit **RDG** if you are interested in obtaining your own print or electronic copy of the magazine. It is free!

## UPCOMING EVENTS

Join us in Australia at the Australian Institute of Occupational Hygienists Annual Conference in December. We will be exhibiting as will our partner **Breathe Safe Intelligent Cabin Air Filtration**. If you are attending the conference please stop by and see the new intrinsically safe DustCount® 9000, and be sure to catch Peter Briscoe's Excite presentation on Monday Dec 2nd at 1 pm!



## LET'S KEEP IN TOUCH!

We hope you enjoyed this issue of Nanozette. Please let us know how we can improve this newsletter and make it even more relevant to your interests and needs. And of course please feel free to pass along to your colleagues! Also if you want all the breaking news, consider following us on LinkedIn and Twitter. If you would like to unsubscribe, we are sorry to see you go but simply click the unsubscribe link in the newsletter email.



# nanozen

know the air you breathe<sup>®</sup>

## FRUSTRATED BY SLOW GRAVIMETRIC TESTING RESULTS?

**INTRINSIC  
SAFE**



CUT DUST EXPOSURE ANALYSIS AND  
REMEDiation EXPLORATION FROM WEEKS TO MINUTES

Nanozen's DustCount<sup>®</sup>, the industries smallest and lightest optical particle counter, offers accurate real-time personal dust monitoring which helps shave days and weeks off your current assessment and remediation efforts.

To learn more visit

[www.nanozen.com/speedmatters](http://www.nanozen.com/speedmatters)

- PM 2.5, PM 4, PM 10 & Inhalable
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- No cyclone required
- Built-in sampling filter
- Selectable dust types
- Integrated wireless control/data

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