

Warehouse Workers Affected by Battery Charging Operations

P-TRAK™ Ultrafine Particle Counter Case Study #11

Background

At a manufacturing plant, several workers in the shipping warehouse complained of sore eyes and throats. The source of these complaints was a mystery. The complaints did not make sense because chemicals were not used in the facility and all forklifts were electrically operated.

Problem Assessment

Management requested an investigation into ultrafine particle levels to better understand conditions in the warehouse and, hopefully, to locate the source of the complaints. Also known as UFPs, ultrafine particles are less than 0.1 micrometer in diameter. The investigator relied on a P-TRAK™ Ultrafine Particle Counter to measure UFPs in real time and report levels in particles per cubic centimeter (cc).

When the investigator arrived, he first measured outdoor UFP levels to determine a background level. This level of 9,000

UFPs Tracked to the Source...

• Background (outside)	9,000
• Warehouse	30,000
• Outcome	<9,000

would be a benchmark to identify unexpected UFP levels during the investigation. The investigator then moved to the warehouse itself and immediately observed UFP readings exceeding 30,000. He quickly identified the battery charging area as the source. During the charging operation, refillable batteries were emitting higher than expected levels of UFPs, which were filling the warehouse.



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Outcome

The exact link between UFPs and IAQ complaints is still not clear. The complaints may stem from sheer quantity of ultrafine particles, their overall chemical makeup or some combination of both.

Current evidence shows that UFPs can trigger immune system reactions in susceptible individuals. Scientific and medical communities in concert with regulatory agencies believe the link between UFPs and human health is important. In support of that belief, they are committing significant resources towards understanding the exact mechanisms and effects of ultrafine particles on our health.



The P-TRAK™ Ultrafine Particle Counter from TSI...

Tracking UFPs with the P-TRAK™ Ultrafine Particle Counter is a new and effective method for identifying the root cause of problems. Targeting the true source, or sources, of unexpected ultrafine particle concentrations helps to clarify indoor air quality and other problems. Removing, repairing or controlling the source and shutting down pathways has been shown to effectively eliminate related complaints.



The P-TRAK™ Ultrafine Particle Counter uses fundamental measurement technology proven around the world in research and industrial applications since 1978. Its data logging feature allows the user to download field measurements for evaluation in TSI's TRAKPRO™ Data Analysis Software or in common word processing and spreadsheet programs, simplifying record keeping and reports.

See www.tsi.com for more information on the P-TRAK™ Ultrafine Particle Counter and TSI's full line of IAQ instruments.

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