

# Intermittent Headaches Tracked to Hospital's Loading Dock Activity

P-TRAK™ Ultrafine Particle Counter Case Study #1

## Background

Every morning and especially on Mondays, a doctor at a large metropolitan hospital complained about vehicle exhaust odors in his second floor office and the headaches that often resulted. Only this occupant complained of the odor; occupants of adjacent offices served by the same air-handling unit had no complaints.

Management investigated the doctor's complaint but could not find evidence of exhaust. Building maintenance personnel made several unsuccessful attempts to eliminate an odor they could not detect. They were unable to placate the doctor by showing him that his office area and the loading dock were serviced by separate air systems. The doctor was labeled a "chronic complainer."

## Problem Assessment

Building maintenance authorized a new investigation that would measure ultrafine particle (UFP) levels, expecting to confirm the absence of exhaust in the doctor's office and put an end to his "imaginary" problem. The investigator used a P-TRAK™ Ultrafine Particle Counter to measure UFP levels in the doctor's office and compare them to levels in supply air, adjacent offices and outside air. All readings were taken in particles/cc.

The UFP levels, all recorded within 20 minutes of each other, provided some very interesting results.

The average outside reading, taken at ground

level and upwind of the hospital, was 20,230. As expected, the building's 95 percent efficient filtering system reduced UFP levels to 910 in both the supply air and adjacent offices. Surprisingly, the average reading in the doctor's office was 8,320—nearly 10 times the readings in adjoining areas.

### UFPs Tracked to the Source...

• Background (outdoors)	20,230
• Supply air and adjacent offices	910
• Doctor's office	8,320
• At wall outlet in doctor's office	15,400
• Doctor's office after repair	910



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The investigation then focused on the doctor's office. Using the P-TRAK™ Ultrafine Particle Counter, maintenance quickly discovered UFP concentrations as high as 15,400 at an AC wall outlet. After covering the outlet with duct tape, the UFP reading in that office quickly dropped to match the adjacent offices.



## 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.



## Outcome

Knowing that the electrical outlet was the source of the UFPs, building maintenance examined the building blueprints and found that the electrical conduit from the doctor's office led to a junction box, which then connected to a conduit that led to the loading dock. The early morning complaint could be easily correlated to vehicle activity in the loading dock. Maintenance sealed the ends of the conduits and the doctor's complaints ended.

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](http://www.tsi.com) for more information on the P-TRAK™ Ultrafine Particle Counter and TSI's full line of IAQ instruments.

**TSI Incorporated** - 500 Cardigan Road, Shoreview, MN 55126-3996 USA

<b>USA</b>	Tel: +1 800 874 2811	E-mail: <a href="mailto:info@tsi.com">info@tsi.com</a>	Website: <a href="http://www.tsi.com">www.tsi.com</a>
<b>UK</b>	Tel: +44 149 4 459200	E-mail: <a href="mailto:tsiuk@tsi.com">tsiuk@tsi.com</a>	Website: <a href="http://www.tsiinc.co.uk">www.tsiinc.co.uk</a>
<b>France</b>	Tel: +33 491 11 87 64	E-mail: <a href="mailto:tsifrance@tsi.com">tsifrance@tsi.com</a>	Website: <a href="http://www.tsiinc.fr">www.tsiinc.fr</a>
<b>Germany</b>	Tel: +49 241 523030	E-mail: <a href="mailto:tsigmbh@tsi.com">tsigmbh@tsi.com</a>	Website: <a href="http://www.tsiinc.de">www.tsiinc.de</a>
<b>India</b>	Tel: +91 80 41132470	E-mail: <a href="mailto:tsi-india@tsi.com">tsi-india@tsi.com</a>	
<b>China</b>	Tel: +86 10 8260 1595	E-mail: <a href="mailto:tsibeijing@tsi.com">tsibeijing@tsi.com</a>	



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