

Dangerous laser printer particles identified

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The identity and origin of tiny, potentially hazardous particles emitted from common laser printers have been revealed by a new study at Queensland University of Technology.

Professor Lidia Morawska from QUT's International Laboratory for Air Quality and Health lead the study to answer questions raised by earlier findings that almost one third of popular laser printers emitted large numbers of ultrafine particles.

These tiny particles are potentially dangerous to human health because they can penetrate deep into the lungs.

Professor Morawska said the latest study found that the ultrafine

particles formed from vapours produced when the printed image is fused to the paper.

"In the printing process, toner is melted and when it is hot, certain compounds evaporate and those vapours then nucleate or condense in the air, forming ultrafine particles." she said

"The material is the result of the condensation of organic compounds which originate from both the paper and hot toner."

The study compared a high emitting printer with a low emitting printer and found that there were two ways in which printers contributed to the formation of these particles.

"The hotter the printer gets, the higher the likelihood of these particles forming, but the rate of change of the temperature also contributes," Professor Morawska said.

"The high emitting printer operated at a lower average temperature, but had rapid changes in temperature, which resulted in more condensable vapour being emitted from the printer.

"The printer with better temperature control emitted fewer particles"

Professor Morawska said this research provided information which would help consumers better understand the risks of laser printers and would help the printer industry to design low or no emission printers.

More information: An Investigation into the Characteristics and Formation Mechanisms of Particles Originating from the Operation of Laser Printers, *Environ. Sci. Technol.*, Article ASAP, DOI: 10.1021/es802193n, pubs.acs.org/doi/abs/10.1021/es802193n

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