

Laser Printer Emissions

Research Study on Laser Printer Emissions

On August 1, 2008, a study by Lidia Morawska, Congron He and Len Taplin in Australia was published in the journal, *Environmental Science and Technology*. It is at the link below:

<http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2007/41/i17/abs/es063049z.html>

This research suggests that office printers emit ultrafine particles which may pose a potential health hazard. The links immediately below are to articles regarding the paper.

http://pubs.acs.org/subscribe/journals/esthag-w/2007/aug/science/nl_printers.html

<http://pubs.acs.org/cen/news/85/i32/8532news4.html>

(The following site is no longer available. To retrieve this story, click the link to news archives, search for laser printer emissions and pay a small fee for the story.)

<http://www.bellinghamherald.com/330/story/146580.html>

Background

As described on the Harvard University website at the link below, people are often concerned about what is being emitted from printers and copiers and whether there are health effects.

The website includes information that the Occupational Safety and Health Administration (OSHA) has established permissible exposure limits (PEL) for specific chemicals and particulate materials.

The PELs are regulatory limits on the amount or concentration of a substance in the air. OSHA PELs are based on an 8-hour time weighted average (TWA) exposure.

As described at the link below, the emission rates for office equipment are generally ten to 100 times below the PELs.

http://www.uos.harvard.edu/ehs/onl_fac_ind_pho.shtml

New studies form the basis for informing experts about potential health issues and must be considered within a wide background of information.

For example, the U.S. Environmental Protection Agency's Indoor Air Quality website at the link shown below shows that in indoor spaces, air quality can be affected by a wide number of possible items.

Laser Printer Emissions

<http://www.epa.gov/iaq/pubs/insidest.html>

Laser Printer Emissions

What We Can Do

Printer emissions are generally at low levels. Most of us have no immediate health effects related to printer use. While more research is needed to understand the impacts of printer use on indoor air quality and long-term implications for those who use printers, we can do certain things to help ourselves.

We can recognize that the media is able to emphasize issues in ways that create news. For example, did you know of a research study several years ago about volatile organic compounds related to printer use? We can attempt to place these research findings into balance with risks we accept without thinking which might be more hazardous.

To paraphrase Professor Morawska, we can make efforts to place printers in areas with adequate ventilation, try to locate them a bit further from us when possible, and recognize that printing certain types of documents can create more particles.

Hewlett Packard (HP) Information

During August 2007, Hewlett Packard, the company that makes many of the printers on campus, has sent the University a safety statement regarding their printers. It is reproduced below

In the fall 2007, Hewlett Packard provided the following link on their website regarding this issue:

http://www.hp.com/hpinfo/newsroom/emissions.html?jumpid=reg_R1002_USEN

High level of user safety with HP LaserJet and HP Color LaserJet printing systems

Release of dust and material emissions of HP laser printing systems are well below applicable occupational limit values

HP is consequently driving the development of user-friendly printing technologies and products. Vigorous tests under standardised operating conditions are an integral part of HP's responsible research and development as well as strict quality control procedures. HP laser printing systems, original HP print cartridges and papers are assessed for dust release and possible material emissions. As a globally active company, HP follows internationally valid health and safety requirements and considers scientifically recognised assessment and certification criteria.

Laser Printer Emissions

Tested toner safety

Original HP toner and HP print cartridges undergo defined quality testing and are strictly examined according to the assessment criteria for preparations in the European Union (Directive 1999/45/EC, as amended). The manufacturing of HP toners and HP print cartridges follows international standards such as ISO 9001:2000 (quality assurance in production) and ISO 14001 (environmental management system).

Low release of material emissions

HP laser printing systems comply with applicable and internationally recognised occupational safety standards. Accordingly, under intended conditions of use, potential device emissions such as ozone and styrene are significantly below the applicable emission limit values of the US Occupational Safety and Health Administration (OSHA)(1) and the German occupational exposure limit values (AGW)(2). Moreover, HP laser printing systems are vigorously checked to meet the stringent office equipment emission guidelines of the US GREENGUARD programme(3) and the emission guide values of the German Blue Angel programme(4) (according to RAL-UZ 85 or RAL-UZ 114).

For the purpose of a preventive health and consumer protection, always the whole HP laser printing system (device, print cartridges and papers) is examined in special test chambers in order to determine potential emission sources comprehensively. Measurements are performed under extreme usage conditions and closely follow the guidelines of the international standard ECMA-328(5), the emission criteria of GREENGUARD(3) and of the Blue Angel programme(4).

Minimal dust emissions

The closed design concept of HP LaserJet and HP Color LaserJet print cartridges effectively limits potential dust release as the imaging drum, the developer roller and other important imaging components are located inside the print cartridge. Besides, HP print cartridges are generally equipped with excess toner reservoirs for the excess toner particles which collect those particles during the printing process and reduce the likelihood that particles are emitted into the room air. Remaining toner or paper particles are wiped off from the imaging drum and collected in the excess toner reservoir. Therefore, under intended handling conditions, users should not come into contact with toner dust (skin or eyes).

To ensure a high level of user safety, HP additionally measures the potential release of dust particles under extreme operating conditions. Following the well-established and generally recognised gravimetric test procedures in environmental test chambers (ECMA-328(5), RAL-UZ 85, RAL-UZ 114), the total mass or the resulting airborne concentrations of emitted particles are considerably low – therefore and because of their chemical properties, they pose no health risk according to the current state of knowledge. Like material emissions, the concentrations of dust particles of HP laser printing systems lie well below the applicable emission limit values of the US Occupational Safety and Health Administration(1) and the German occupational exposure limit values(2). Moreover, HP laser printing systems are vigorously checked to meet the stringent office equipment

Laser Printer Emissions

emission guidelines of the US GREENGUARD programme(3) and the emission guide values of the German Blue Angel programme(4) (according to RAL-UZ 85 or RAL-UZ 114).

Recently, newly deployed measurement methods have made it possible to determine the particle size distribution even for smallest particles within the very small amounts of total particulate matter. Currently available measurement results of the German Federal Environmental Agency (Umweltbundesamt, UBA) show that toner particles (average diameter from 5 to 10 µm) as well as paper dust are released only to a very small extent(6). In the context of the describing and comparing examinations of the UBA, also ultrafine particles (UFP, < 0.1 µm) were found with the new measurement methods.

Currently, it is not possible to comment on the nature and chemical composition of these particles according to the UBA.(6) Based on the available results, comments on potential health risks are not possible either.(6) Recent studies of the Fraunhofer Wilhelm-Klauditz-Institute (FhG WKI) support these observations and it is assumed that the determined UFPs are not solid particles but condensation products or small droplets that are created during the thermal printing process and measured as particles by particle counters.(7)

High user safety of HP LaserJet and HP Color LaserJet printing systems

Users of HP laser printing systems can rely on tested toner, low release of material emissions and minimum dust emissions. Thus, there are no indications for health risks when HP laser printing systems are operated as intended. Furthermore, the scientific results show that an additional margin of safety can be assumed under real-life conditions in office rooms and work spaces.

Independent experts attest safety of HP laser printing systems

HP seeks the constant dialogue with the UBA, responsible German Professional Associations and experts for environmental hygiene in order to ensure user safety of HP LaserJet and HP Color LaserJet printing systems. Independent experts and institutions attest the safety of properly operated devices – even under real-life conditions: a study on emissions at workplaces with printers and copiers in the offices of the Federal Bureau for Social Affairs, Family and Health in Thuringia demonstrated that laser printers do not figure as significant sources of dust emissions and therefore no health risk is to be expected.(8) The Professional Associations as well as independent scientific institutions of the Professional Association for the Administrative Sector, which regularly check emissions from office devices, either did not find any indications for an increased health risk due to laser printer emissions or toner dust.(9)(10)