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Press release

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Using vacuum cleaners to investigate indoor pollution

Particle pollution is a global issue often associated with the outdoor environment. Shedding light on this problem from another perspective, Electrolux has initiated “The Invironment Project” – a research initiative to investigate what indoor pollution looks like in consumer homes, from Los Angeles to Singapore.

“Seeing is believing and we aim to turn what’s invisible at home visible. 90% of our time is spent indoors and therefore the “invironment” is just as important to consider as the environment. Indoor environment is at the core of our business and real life testing also generates insights of what is demanded from future generations of vacuum cleaners,” said Nicolas Lanus, President of Electrolux Small Appliances EMEA.

Dust was collected from cities with various air pollution issues – Los Angeles (USA), Sao Paulo (Brazil), Stockholm (Sweden), Singapore, Paris (France), Seoul (South Korea) and Taipei (Taiwan). Two homes were sampled in each city through a normal vacuuming session with an Electrolux UltraOne, a vacuum cleaner with a completely sealed system. Senior scientist and PhD, Gulaim Seisenbaeva, at the Swedish University of Agricultural Science (SLU), executed the analysis using an elemental detector to identify non-organic particles in the dust.

“Particle research and equipment is usually focused on measuring particle amount and size. In the vacuum cleaner study together with Electrolux we’ve instead been focusing on quality rather than quantity – what actually constitute the particles,” Seisenbaeva said. “The vacuum cleaner system captured and contained particles for the analysis and is in many ways analogue with normal methods when controlling indoor environment. In fact, the dust bag was so effective that the filter was almost completely clean when we analyzed it.”

A dust bag says more than a thousand words

The particle findings encompass a wide range; from common materials including plastic and concrete to soot particles and electronic capacitor filling with heavy metals such as zirconium, niobium, cadmium and barium, which depending on the amount can cause allergy and respiratory damage. The results show that 58% of the particles originate from outdoor sources and are dependent on context. For instance iron-rich gypsum, a traditional and widely used coagulant to produce Chinese-style tofu, was found in Taipei, and traces from skeletons of marine organisms were found in the Los Angeles dust bags.

Habits, preferences, activities and personal possessions also have a significant impact on the indoor environment, the study showed. Having a dog equals traces of excrements. Playing tennis equals traces of grass or clay. Wearing shoes indoors created higher particle levels in general. In other words: the dust bag tells the truth about the consumer and his/her lifestyle. Read more about the findings [here](#).

As a part of the initiative to make what’s invisible visible, the visual elements from the analysis have been heavily enlarged into a series of photographs. The images features magnified particles of various kinds from the vacuum cleaners, which in this form engender beautiful shapes and patterns, instantly perceived as abstract artworks. The collection is on display now via [Pinterest](#).

A completely sealed system

A vacuum cleaner is a good tool for maintaining a clean home environment. However, earlier studies by SLU show that older vacuum cleaners may in fact contribute to indoor air pollution by releasing bacteria and dust particles into the air, potentially spreading infections and triggering allergies. In other words, the age and quality of vacuum cleaners makes a significant difference.



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The vacuum cleaner used in the Invironment Project is a new generation of Electrolux' flagship model, the UltraOne. This highly efficient vacuum cleaner has a front-to-end sealed system – from nozzle to air outlet. Due to a well-balanced combination of suction, airflow and dust pick-up, the UltraOne worked as a useful tool for collecting particle samples for the elemental detector analysis. It is fitted with both a specially developed dust bag, called Ultra Long Performance s-bag®, and a highly efficient HEPA 13 filter. All together the vacuum cleaner captures 99.999% of all particles it vacuums, preventing them to be released back into the indoor environment.

For further information, please contact: Electrolux Press Hotline, +46 8 657 65 07.

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