

NAILING IT: HOW TO ENHANCE IAQ AND SAVE ENERGY IN NAIL SALONS

RenewAir ERVs provide cleaner and healthier indoor air for nail salons while generating major energy savings

By Nick Agopian

Nail Salons are Especially Vulnerable to Deficient IAQ

Nail salons can contain some of the most polluted indoor air of any type of building. This is due to the numerous chemicals, toxins, vapors, gases, odors, sub-micron particles and other harmful Total Volatile Organic Compounds (TVOCs) that are off-gassed from the solutions, creams, sprays, hardeners, glues and liquids commonly used in nail salons. Not to mention the considerable amount of dust released into the air from constant nail filing.

This continuous and intense build-up of internally generated contaminants makes nail salons especially vulnerable to deficient indoor air quality (IAQ)—a problem that's magnified by the small spaces salons normally occupy since this leads to higher concentration levels. Deficient IAQ can be extremely harmful to indoor occupants as it causes many short- and long-term health problems, such as respiratory difficulties, skin infections, cancer, lung diseases and a myriad of reproductive-health complications.¹

Specifically, four chemicals that are commonly off-gassed from nail products are the worst offenders in the salons. These are:

- ◆ **Dibutyl phthalate (DBP):** A chemical used to make nail polish and other products pliable that's banned in the European Union since it can cause developmental defects, reduced sperm counts and changes in the testes and prostate.²
- ◆ **Toluene:** A chemical used to help nail polish glide on smoothly that can impair cognitive and kidney function and harm a developing fetus.³
- ◆ **Formaldehyde:** A hardening agent that's banned in the European Union since it can cause cancer in humans.⁴
- ◆ **PM_{2.5}:** Fine, inhalable particulate matter (PM) with diameters 2.5 micrometers and smaller that can penetrate deeply into lungs and impair respiratory function.⁵

Further, nail salons can suffer from elevated indoor levels of carbon dioxide (CO₂), a constituent of exhaled breath, due to high occupant densities. This is troubling as well since the Harvard School of Public Health and Lawrence Berkeley National Laboratory found that CO₂ negatively impacts thinking and decision-making at levels commonly found inside all buildings,⁶ thus adding to the challenges posed by deficient IAQ for nail salons.

Increased & Balanced Ventilation Enhances IAQ in Nail Salons

The best way to provide cleaner and healthier air inside all buildings, and particularly in nail salons, is through increased and balanced ventilation. By replacing stale indoor air with the same amount of fresh and filtered outdoor air, effective ventilation will achieve high-quality indoor air.



Nail salons are vulnerable to deficient IAQ
Image source: Asian Fortune News

Unlike exhaust-only systems, balanced ventilation exchanges equal parts of air, thus averting pressure fluctuations and preventing outdoor contaminants from being drawn indoors uncontrolled. Plus, balanced ventilation with a push-pull strategy is the best and most economically beneficial way to achieve high ventilation effectiveness to control indoor pollutants.

Awareness of nail salons' vulnerable state in terms of contaminated indoor air, as well as the effectiveness of increased and balanced ventilation in enhancing IAQ, are growing. In fact, New York State recently passed legislation requiring ventilation systems in nail salons to meet standards outlined in the 2015 International Mechanical Code, which is the most widely used mechanical code in the U.S.⁷ These requirements include:

- ◆ Fresh outdoor air must be supplied sufficiently to remove all chemicals, vapors, fumes, dust and other air contaminants from the salon, and these pollutants must all be exhausted safely to the outdoors.⁸
- ◆ Ventilation systems must assure that no exhaust air will be recirculated into the salon or into any other space in the building where the business is operating.⁹
- ◆ Specific exhaust systems must be installed at all manicure and pedicure workstations.¹⁰

¹ Nir, Sarah Maslin, "Perfect Nails, Poisoned Workers," New York Times, May 8, 2015, https://www.nytimes.com/2015/05/11/nyregion/nail-salon-workers-in-nyc-face-hazardous-chemicals.html?_r=0.

² "Dibutyl Phthalate," David Suzuki Foundation, <http://davidsozuzki.org/issues/health/science/toxics/chemicals-in-your-cosmetics---dibutyl-phthalate/>.

³ Nir, Sarah Maslin, "Perfect Nails, Poisoned Workers," New York Times, May 8, 2015, https://www.nytimes.com/2015/05/11/nyregion/nail-salon-workers-in-nyc-face-hazardous-chemicals.html?_r=0.

⁴ Nir, Sarah Maslin, "Perfect Nails, Poisoned Workers," New York Times, May 8, 2015, https://www.nytimes.com/2015/05/11/nyregion/nail-salon-workers-in-nyc-face-hazardous-chemicals.html?_r=0.

⁵ "Indoor Air Quality Survey of Boston Nail Salons," JBS Environmental Health and Justice Program, Brandeis University, <https://www.brandeis.edu/jbs/pastprograms/f2011/nailstudy.pdf>.

⁶ Joe Romm, "Exclusive: Elevated CO₂ Levels Directly Affect Human Cognition, New Harvard Study Shows," Climate Progress, October 26, 2015, <http://thinkprogress.org/climate/2015/10/26/3714853/carbon-dioxide-impair-brain/>.

⁷ "Governor Cuomo Announces New Ventilation Standards For Nail Salons," Office of the Governor of New York State, July 22, 2016, <https://www.governor.ny.gov/news/governor-cuomo-announces-new-ventilation-standards-nail-salons>.

⁸ "Governor Cuomo Announces New Ventilation Standards For Nail Salons," Office of the Governor of New York State, July 22, 2016, <https://www.governor.ny.gov/news/governor-cuomo-announces-new-ventilation-standards-nail-salons>.

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¹⁰ "Governor Cuomo Announces New Ventilation Standards For Nail Salons," Office of the Governor of New York State, July 22, 2016, <https://www.governor.ny.gov/news/governor-cuomo-announces-new-ventilation-standards-nail-salons>.

RenewAire ERVs Enhance IAQ Energy-Efficiently, Cost-Effectively & Sustainably

Increased and balanced ventilation is the most effective way to enhance IAQ, but conventional systems waste energy and therefore lead to additional costs. What's the best way to enhance IAQ energy-efficiently, cost-effectively and sustainably? The answer is via RenewAire Energy Recovery Ventilators (ERVs), which are designed to generate the simplest form of source capture and air change with fresh outdoor air, all while optimizing energy efficiency and ventilation effectiveness.

RenewAire ERVs replace stale indoor air with fresh and filtered outdoor air that's tempered with the otherwise-wasted energy of the heat and humidity from the exhaust airstream. This process results in a lower steady-state concentration of the gases and contaminants generated from the inside, as well as less energy used by the HVAC system, thus realizing significant annual energy savings over the long-term.

What's more, RenewAire ERVs are simple to apply, install, maintain and operate. Consisting of a durable static core, there are no moving parts and there's minimal maintenance, thus ensuring ultimate reliability. Further, RenewAire offers an industry-leading 10-year performance warranty so building owners can have peace of mind and be assured that they can downsize capital equipment and save energy every year for the life of the ERV.

Nail Salons Can Enhance IAQ While Saving Energy with RenewAire ERVs

By installing RenewAire ERVs, nail salons can enhance IAQ while generating major energy savings at the same time. The direct beneficiaries are the indoor occupants who can: 1) Experience fewer short- and long-term health problems, 2) Be able to achieve more coherent thinking and decision-making and 3) Have fewer sick days, thus boosting productivity and earning potential—which all adds up to an improved human condition.

In addition, tenants will appreciate decreased energy costs achieved by RenewAire ERVs and building owners will see an impressive return on investment (ROI) due to lower capital and operating costs, increased lease potential and greater building asset value. In fact, with an average RenewAire ERV internal rate of return of over 45 percent, the net present value of future cash flows on an investment of \$6,000 is nearly \$40,000 over 15 years. RenewAire ERVs have no increased costs, and the cash flow and ROI are always positive no matter the metric.

In Sum

Nail salons are incredibly susceptible to deficient IAQ, which harms health, cognitive function and productivity, thus impairing wellbeing. To enhance IAQ, while also realizing major energy savings, the solution is increased and balanced ventilation via RenewAire ERVs, which provide cleaner and healthier indoor air energy-efficiently, cost-effectively and sustainably. This not only better indoor occupants' human condition, it also boosts the bottom line.

To enhance IAQ and save energy in your building, [contact](#) RenewAire today to specify an ERV.

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