

Artificial Fingernails and Indoor Air Quality

A Guide to Controlling Chemical Exposures

Introduction

Working with artificial fingernails can be harmful to health. The chemicals found in artificial nails can be harmful not only to employees, but also to customers. Chemical vapors can even escape the salon and affect neighboring businesses. However, nail work can be done safely if the proper steps are taken. This fact sheet suggests the measures that employers and employees can take.



What is the Problem?

The chemicals in artificial nail products can enter the body from breathing them, from accidentally swallowing them, or from absorbing them through the skin. Whether they affect a person's health depends on several factors:

- how often and how long one is exposed to the chemicals
- how the chemicals enter the body
- the amount of the chemicals in the air or on the skin
- the kinds of harm a specific chemical can cause

Artificial nail products can irritate the skin and cause a rash. They can also cause dryness, flaking and cracking of the skin.

An allergy to some chemicals may also develop, resulting in redness, itching, hives and sometimes blisters. Once an allergy to a chemical develops, exposure to even a tiny amount can cause an allergic reaction – which in extreme cases can be life-threatening. Nail products which can produce an allergic skin reaction include methacrylates, formaldehyde and benzoyl peroxide.

Eyes

Contact with vapors and airborne dusts can cause irritation and redness, burning, itching or discomfort. The eyes may water and vision may briefly become distorted. Chemicals which can cause these effects include acrylates and many solvents, such as methyl ethyl ketone (MEK) and acetone.

Nose, Throat and Lungs

These same chemicals can also irritate the nose, throat and lungs. Symptoms include irritation or soreness of the nose and throat, hoarseness, coughing, lung congestion, chest tightness and shortness of breath. Cigarette smoking can worsen these symptoms. Chronic bronchitis can develop from repeated exposure to chemicals that irritate the lungs.

Repeated exposure to some of the artificial nail products, such as ethyl methacrylate, can cause asthma. Symptoms of asthma include difficulty breathing, wheezing, coughing, shortness of breath and tightness in the chest. Once a person becomes sensitized to a chemical, extremely small amounts of that chemical (or even similar ones) can cause asthmatic attacks. Occupational exposure limits established by recognized reference organizations (such as OSHA and the American Conference of Governmental Industrial Hygienists [ACGIH]) do not typically protect against sensitization. Therefore, exposure to chemicals that cause asthma or other allergies should be kept as low as possible.

Nervous System

Breathing in the vapors of certain chemicals can affect the brain the same way as drinking too much alcohol does. Over-exposure to these vapors can cause headaches, nausea and dizziness, as well as make one feel irritable, confused or drunk. Long-term exposure can affect the brain (including the ability to learn and to concentrate). Some of these chemicals are MEK, acetone, toluene, xylene, ethyl ether and methacrylates.



Cancer

Most of the substances used in artificial nails have not been adequately tested to see if they can cause cancer. Formaldehyde and methylene chloride are suspected of causing cancer. Avoid products that contain these chemicals.

Reproductive System

Most of the chemicals used in artificial nails have not been adequately tested to see if they can harm a developing baby or affect the fertility of men or women. Organic solvents are used in artificial nail products and can be absorbed into the body by inhalation or by skin contact. This type of chemical can cause birth defects when a pregnant woman is exposed to them. They can also harm the nursing infant. Avoid the use of acetonitrile and the glycol ethers if at all possible.

How Can I Identify Dangerous Chemicals?

The products that a manicurist or nail technician uses are made up of many different chemicals. It is important to know the ingredients and hazards of the chemicals being used.

The Right to Know

The Hazard Communication Standard is a regulation of the federal Occupational Safety and Health Administration (OSHA) that gives employees the right to know the health and safety hazards of the products that they use on the job. This standard requires chemical manufacturers and importers to provide hazard information to employers by means of a fact sheet, called a Material Safety Data Sheet (MSDS). It is the employer's responsibility to obtain the MSDSs from the manufacturer or distributor for all hazardous products used in the salon and to make them easily available to employees.

Material Safety Data Sheets

An MSDS must list the hazardous ingredients of a product, discuss any health and safety hazards and suggest ways to use the product safely. The MSDS must also describe any fire and explosion hazards, first aid and procedures for cleaning up leaks and spills.

Employees who believe that they are exposed to a chemical which might affect their health should ask their supervisor for the MSDS for that product. Employers should ask their suppliers for the MSDS.

Sometimes MSDSs can be hard to understand. To help workers understand them, the Massachusetts Department of Labor Standards (DLS) has a publication, "Understanding MSDSs: Your Right to Know" (see **For More Information**, at the end of this pamphlet). MSDSs can also be incomplete or just plain wrong. If you have difficulty getting an MSDS, or you think that they may be wrong, contact your local OSHA office (see **For More Information**).

Worker Education

In addition to an MSDS, employers are required to have an education program to tell employees about the hazards of the chemicals with which they work, as well as how to work safely with them.

What Protective Measures Can I Take?

In the nail salon, to get rid of the chemical vapors in the air, nail technicians should apply artificial fingernails at a ventilated work table. It is also helpful to keep all bottles of fingernail liquid tightly capped. In addition, it may be helpful to look at work habits to see if they can be improved. Finally, proper general room ventilation is important to keep toxic chemicals from drifting into nearby businesses.

Use a Ventilated Table

A ventilated table is a table that has a fan that pulls the chemical vapors into a duct and away from both the nail technician and the customer. A ventilated table protects the technician and customer best against breathing toxic chemicals. The ventilation system should be designed to vent contaminated air to the outside, not inside the shop (for details on how to design and install a ventilated table, obtain the NIOSH publication, "Controlling Chemical Hazards During the Application of Artificial Fingernails" – see **For More Information**).

Keep Dispenser Bottles Closed

Use dispenser bottles that have small openings, only large enough for an application brush to enter. The bottle stoppers should be pressure-sensitive. A dispenser bottle with a pressure-sensitive stopper and small opening will result in less evaporation of the fingernail liquid and, thus, will cut down on possible exposures to methacrylates and waste less product.

Improve Your Work Habits

Nail technicians can also lower their exposures to these airborne chemicals by changing some of their work habits:

1. Place chemical-soaked gauze pads in a sealed bag before throwing them in the trash can.
2. Change trash can liners daily.
3. Pour only the amount of fingernail liquid needed into the closed dispenser bottle.
4. Nail technicians should wear personal protective clothing and glasses. When technicians remove artificial nails, chips of acrylic often fly off, creating a need for eye protection. In addition to safety glasses, technicians also should wear long sleeves and gloves to protect their skin from acrylic dust. To protect against breathing the dust, a dust mask should be worn.
5. Technicians should wash their hands, arms and face with mild soap and water several times throughout the day to remove potentially irritating dust.
6. Do not eat or drink where artificial fingernails are applied or in other working areas. Methacrylates in nail dust can be carried accidentally to the mouth or face on a cup or other food item, and this contact may cause a skin rash. Also, many other chemicals are used in a salon that could cause health problems if swallowed.
7. Prohibit smoking in the entire salon because many of the chemicals in a beauty shop, including nail products, catch fire easily.

Provide Adequate Room Ventilation

As with any indoor environment, artificial nail salons should provide general dilution ventilation with an adequate supply of outside air.

The minimum recommended amount is 25 cubic feet per minute of fresh air per occupant for beauty salons. To avoid spreading chemical vapors to neighboring businesses, nail salons should not share the same ventilation system with another business and should have negative air pressure in relation to adjacent spaces. To maintain negative pressure, the salon should exhaust slightly more air than is supplied so that any leakage of vapors will not enter adjacent businesses. A ventilation contractor can measure the amount of fresh air and air pressure in the salon.

In addition, walls separating the salon from other businesses should have no holes, gaps or cracks. Check with your local board of health to find out about any local regulations that may apply to nail salons.

For More Information

To obtain more information about health and safety in artificial nail salons or about other occupational safety and health issues:

Massachusetts Department of Labor Standards

Phone: 617- 969-7177

www.mass.gov/dols

U.S. Occupational Safety and Health Administration (OSHA)

Braintree: 617- 565-6924

Methuen: 617-565-8110

Springfield: 413-785-0123

www.osha.gov

National Institute for Occupational Safety and Health (NIOSH)

Phone: 1-800-356-4674

www.cdc.gov/niosh

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