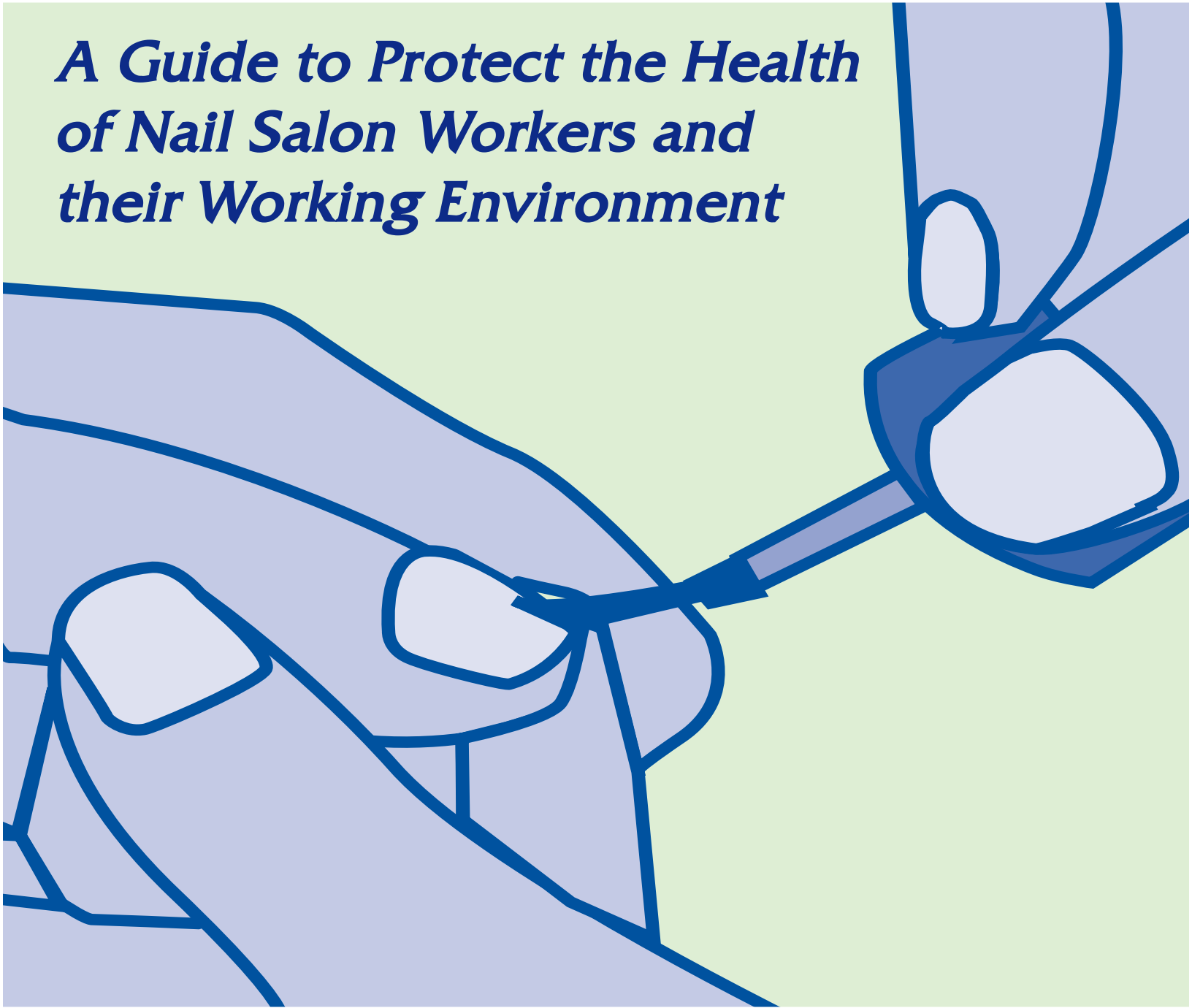


Pollution Prevention Practices for Nail Salons

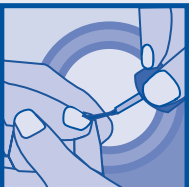
A Guide to Protect the Health of Nail Salon Workers and their Working Environment



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United States Environmental Protection Agency
Region 6
Office of Pollution Prevention and Toxics
Office of Administration and Resource Management
EPA 906-F-04-001
May 2004

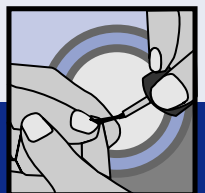


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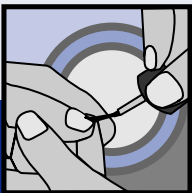
This Guide was funded by the U.S. Environmental Protection Agency's Region 6, Office of Pollution Prevention and Toxics, and Office of Administration and Resource Management through contract 68-W-02-024 with ERG.

Much of our work could not have happened without the vital partnership we established with our pilot shops, other federal, state, local government agencies, and many individuals and organizations from the Asian-American communities in Houston, Texas. We are also grateful to our peer reviewers who had provided their valuable assistance to the content of this document. We sincerely thank all of these individuals and organizations for the incredible resources they provided and for continuing to inspire our efforts and motivate our work.

U.S. Environmental Protection Agency - Design for the Environment Program
U.S. Environmental Protection Agency - White House Initiative on Asian Americans and Pacific Islanders
U.S. Environmental Protection Agency - Office of Environmental Justice
U.S. Environmental Protection Agency - Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency - Regions 3, 5, and 9
U.S. Food and Drug Administration
U.S. Occupational Safety and Health Administration
Texas Cosmetology Commission
Texas Department of Health
City of Houston
Center for Research on Minority Health at the University of Texas M.D. Anderson Cancer Center
University of Texas Health Science Center at Houston - School of Public Health
Asian American Health Coalition
Nails for You Training Academy
Pioneer Valley Project
Saigon Houston Radio
Vietnamese American Community Health Network
Vietnamese American Physicians Group in Arlington, Texas



Nail salon products may contain many potentially harmful chemicals that can be a major cause of occupational asthma as well as other health and environmental concerns. Nail salon workers, often times, are new immigrants and not aware of the risks with chemicals in nail products that they are using every day. As requested by the Asian-American community in Houston, Texas, EPA Region 6, in collaboration with the Design for the Environment program, is partnering with nail salons to investigate and improve health and environmental practices. To make shop owners and employees more aware of the day-to-day health and environmental concerns that they face, this Guide provides information on chemicals that are typically found in nail salon products and their potential health effects. It also explains various types of important information a Material Data Safety Sheet contains that shop owners and employees should know. Finally, this Guide recommends many better shop practices that a salon should consider adopting to reduce or minimize potential health and environmental effects inside the shop.

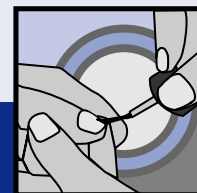


NAIL SALON CHEMICALS AND THEIR POTENTIAL HEALTH EFFECTS

Nail salons use many products that contain a variety of chemicals, such as solvents, hardeners, fragrances and drying/curing agents, that may be hazardous to workers, customers, and the environment if not used or disposed of properly.

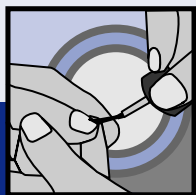
Many chemicals present in nail products are very volatile; they will evaporate into the air at room temperature where nail technicians and customers may breathe them. In addition, nail technicians and customers may also breathe in dust that is produced when filing artificial nails. This dust may contain harmful substances such as glues, benzoyl peroxide, silica and methacrylate polymers.

The table on the next page summarizes chemicals typically found in nail care products and their potential health effects.



Potential Health Effects of Chemicals Present in Nail Care Products

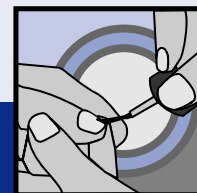
CHEMICAL	USAGE	POTENTIAL HEALTH EFFECTS*
Acetone	nail polish remover, fingernail glue remover	headache, dizziness, irritation to skin and eyes, loss of appetite, inability to sleep, depression
Acetonitrile	fingernail glue remover	irritation to eyes, skin, nose, and throat, chest pain, vomiting, muscle contraction, weakness, exhaustion, near or total unconsciousness, liver and kidney damage in animals
Benzene	fingernail glue	a known cancer-causing chemical to workers, irritation to eyes, skin, nose, mouth, throat, and lungs, dizziness, headache, nausea, difficulty walking, loss of appetite, weakness, exhaustion, skin rash, fever or chills, bruising or bleeding
Benzoyl peroxide	powder-acrylic artificial nails	irritation to eyes, skin, nose, mouth, throat, and lungs, skin rash
n-Butyl acetate	nail polish	irritation to eyes, skin, nose, mouth, and throat, headache, drowsiness, confusion and/or haziness
sec-Butyl acetate	nail polish	irritation to eyes, skin, nose, mouth, and throat, headache, drowsiness, confusion and/or haziness
tert-Butyl acetate	nail polish	irritation to eyes, skin, nose, mouth, and throat, headache, drowsiness, confusion and/or haziness
Butyl methacrylate	liquid-acrylic and porcelain artificial nails	irritation to eyes, skin, nose, mouth, throat, and lungs, skin rash, loss of appetite, inability to sleep and concentrate, depression, asthma
Camphor	nail polish	irritation to eyes, skin, and nose, nausea, vomiting, diarrhea, headache, dizziness, excitement, uncontrollable muscle contraction
Di-n-butyl phthalate	nail polish, nail hardener, nail base, nail top coat, nail thickener	irritation to eyes, mouth, nose, throat, and stomach, reproductive hazard
Ethyl acetate	nail polish, fingernail glue	irritation to eyes, skin, nose, throat, skin rash, confusion and/or haziness
Ethyl cyanoacrylate	fingernail glue	irritation to eyes, skin, nose, throat, skin rash from prolonged contact, asthma
Ethyl ether	nail polish remover, fingernail glue remover	irritation to eyes, skin, nose, mouth, throat, and lungs, headache, drowsiness, excitement, confusion and/or haziness, nausea, vomiting, skin rash



Potential Health Effects of Chemicals Present in Nail Care Products

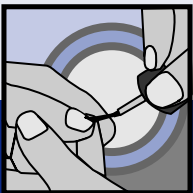
CHEMICAL	USAGE	POTENTIAL HEALTH EFFECTS*
Ethyl methacrylate	liquid - acrylic and porcelain artificial nails	irritation to eyes, skin, nose, mouth, throat, loss of appetite, inability to sleep, depression, skin rash, asthma
Formaldehyde	nail polish, nail hardener	might cause cancer to workers, irritation to eyes, nose, throat, and lungs, runny eyes, cough
Fiberglass	fabric overlay - artificial nails	irritation to eyes, skin, nose, and throat, breathing difficulty
Hydroquinone	primer - acrylic and porcelain artificial nails	irritation and inflammation to eyes, skin, and the cornea, central nervous system excitement, colored urine, nausea, dizziness, suffocation, rapid breathing, muscle contraction, excitement, unconsciousness, skin rash
Isobutyl methacrylate	liquid - acrylic artificial nails	irritation to eyes, skin, nose, mouth, throat, and lungs, skin rash, high concentrations can cause loss of appetite, inability to sleep, depression, asthma
Methacrylic acid	primer - acrylic and porcelain artificial nails	irritation to eyes, skin, and nose, burning of eye and skin, asthma
4-methoxyphenol	liquid & primer - acrylic artificial nails	irritation to eyes, skin, nose, and throat, burning of eye and skin, loss of appetite, inability to sleep
Methyl ethyl ketone	primer - acrylic artificial nails	irritation to eyes, skin, and nose, headache, dizziness, vomiting, skin rash
Methyl methacrylate	liquid - acrylic and porcelain artificial nails	irritation to eyes, skin, nose, and throat, skin rash, asthma
Neoprene	fingernail glue	skin rash
Nitrocellulose	nail polish	heart rate elevation, clumsiness, nausea, vomiting
Titanium dioxide	nail polish, powder - acrylic artificial nails	might cause cancer to workers, permanent scarring of the lungs
Toluene	nail polish, fingernail glue	irritation to eyes and nose, weakness, exhaustion, confusion, dizziness, headache, pupils dilation, teary eyes, anxiety, muscle fatigue, inability to sleep, feelings of numbness, burning, skin rash, liver and kidney damage

* Depending on conditions of exposure which may be reduced by the use of personal protective equipment such as mask, gloves, etc. See the References in the back of this Guide for sources cited.



LIQUID METHYL METHACRYLATE (MMA) MONOMER

- Liquid MMA monomer was a commonly used ingredient in artificial nail products for many years
- Liquid MMA monomer is a chemical substance that evaporates easily and bonds strongly with the nail
- Liquid MMA monomer may cause damage to the nail bed, permanent loss of the nail plate, and loss of sensation in the fingertips of customers and technicians
- Liquid MMA monomer may cause exposed people to develop an allergic reaction after repeated exposure
- Testing done on animals that had been exposed to liquid MMA monomer suggests that liquid MMA monomer may cause permanent damage to the respiratory system and to the liver from long-term exposure.
- In the early 1970s, the Food and Drug Administration (FDA) received a number of personal injury complaints associated with the use of fingernail extenders containing liquid MMA monomer. After investigations and discussions with medical experts, the FDA concluded that liquid MMA monomer was a poisonous and harmful substance that should not be used in fingernail preparations. Court rulings resulted in legal action against one firm, as well as several seizure actions and voluntary recalls to remove products containing 100 percent liquid MMA monomer from the marketplace.
- Across the United States, 30 states have restricted or banned the use of liquid MMA monomer
- Unlike liquid MMA monomer, powder MMA polymers are comparatively safe because they do not readily evaporate or penetrate the skin



MATERIAL SAFETY DATA SHEETS (MSDS)

What is a MSDS?

- A very important document that explains the risks, precautions, and response actions related to exposure to a particular hazardous chemical, both during normal work shifts and in emergency situations. A sample MSDS is shown on the next page.

Why is it important to keep MSDSs in your shop?

- The law requires that MSDSs must be kept in a nail salon
- Keep MSDSs in your shop to ensure that all employees:
 - Are aware of the dangers posed from hazardous chemicals stored in the salon
 - Know how to respond in an emergency or overexposure
 - Know how to dispose of hazardous waste properly
 - Know what protective equipment (e.g., masks, gloves) should be worn when working with a chemical

What should nail salon technicians do with MSDS?

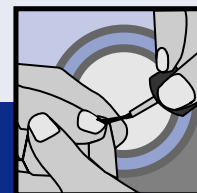
- Review and understand the content of MSDS
- Know where they are kept in the salon

What should nail salon owners do with MSDS?

- Ask for the most up-to-date version of the MSDS every time nail products are purchased. Pay particular attention to those chemicals listed on pages 4 and 5
- Keep a binder that has MSDSs for all hazardous chemicals stored and used in the salon
- Store MSDSs in a location accessible to employees
- Inform employees where MSDSs are stored
- Provide training for reading and interpreting the MSDSs
- Read MSDSs to know what kind of protective equipment (e.g., masks, gloves) should be purchased for employees

How can you get copies of MSDSs for your shop?

- From your nail products suppliers. By law, your suppliers must provide you with a copy of an MSDS for each product that contains hazardous chemicals when you request one.
- From the manufacturer of the product. Call the phone number provided on the label of the product container or log on to the product manufacturer's Web site to fill out your request.



MATERIAL SAFETY DATA SHEET

SECTION I - MANUFACTURER'S NAME AND CONTACT INFORMATION

Manufacturer's name and address

Emergency phone number

Call this number in case of an emergency

Chemical name can be found here

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Lists hazardous components and exposure limits

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical state (gas, liquid, or solid), boiling point, freezing point, vapor pressure, specific gravity

This section explains what may cause the chemical to catch fire and how to put out fire

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash point, extinguishing media, special fire fighting procedures, unusual fire and explosion hazards

SECTION V - REACTIVITY DATA

Stability, incompatibility, hazardous decomposition or by-products

This section explains the health hazards and symptoms workers may have if they have been overexposed

SECTION VI - HEALTH HAZARD DATA

Routes of entry/exposure

Health Hazards

Carcinogenicity

Signs and symptoms of exposure

Medical conditions generally aggravated by exposure

This section indicates if this chemical can cause cancer

This section lists illnesses that can be worse if exposed to this chemical

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Emergency and First Aid Procedures

Steps to be taken in case material is released or spilled

Waste disposal methods

Precautions to be taken in handling and storing

This section explains how to clean up spills

This section explains what to do in an emergency

This section describes how to dispose of this chemical properly

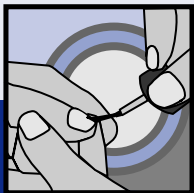
SECTION VIII - CONTROL MEASURES

Respiratory protection

Ventilation requirements

Personal Protective Equipment

This section describes the proper personal protective equipment (e.g., gloves) to wear and ventilation requirements when using this chemical



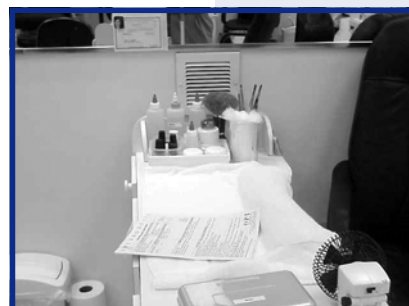
The following best shop practices were developed in collaboration with actual shops and project partners. They are recommended to reduce or minimize the environmental and human health risks from the exposure to potentially hazardous chemicals present in nail care products. Since state and local requirements may be mandated that differ from any of these recommendations, contact your local Cosmetology Board and/or your state Health Department for more information.

To Minimize Breathing In Chemicals

- Install a local exhaust ventilation system - The general heating, ventilating and air-conditioning system (HVAC) only dilutes a small percentage of the air inside the shop. A nail salon should have one or a combination of the following to capture vapors and dust, and to exchange indoor air with fresh air from outside the building:
 - ventilated table with dust and charcoal filters
 - ceiling-mounted exhaust vent
 - wall-mounted exhaust vent
- Install free standing air purifiers at work tables
- Turn the general ventilation system (HVAC) on during work hours
- Replace charcoal and dust filters regularly and according to the manufacturer's directions
- Keep the top of the ventilated table clear of obstructions
- Close nail care product containers when not in use
- Get only the amount of chemicals needed per application
- Keep chemicals in smaller-sized glass (or nalgene) bottles at the work table
- Transfer nail care products from large containers to smaller containers - Perform this task in a well-ventilated area, such as outside or near an open window or door, and wear an organic vapor cartridge respirator.
- Place a trash bin, preferably metal, with a secure lid at each station
- Keep trash bins completely covered at all times
- Place waste soaked with chemicals in a sealed container (e.g., a used plastic milk jug or resealable bag) before disposing it in a closed-lid trash bin



Exhaust vent embedded in nail care workstation



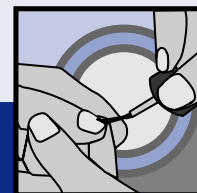
Wall-mounted exhaust vent located near nail care workstation



Individual charcoal air purifiers located at each nail care workstation



Nail care workstation with an individual charcoal air purifier





Autoclaving is the best way to sterilize nail care instruments

- Change trash bin liners at least daily
- Wear dust mask recommended in the MSDS when working on customers to prevent inhaling particles

To Minimize Skin Exposure

- Wash hands before and after working on each customer, before eating, and after handling chemicals and using the bathroom
- Wear gloves recommended in the MSDS when handling nail care products and working on customer
- Replace gloves immediately if there are signs of cuts, tears or holes
- Wear long-sleeved clothing
- Keep containers closed when not in use
- Get only the amount of chemicals needed per application
- Keep chemicals in smaller size glass (or nalgene) bottles at the work table to reduce the risk of spills and potential skin exposure
- Transfer nail care products from large containers to smaller containers
- Wear gloves recommended in the MSDS, eye protection or an organic vapor cartridge respirator and use a funnel to avoid spills while transferring products to smaller containers

To Prevent Accidentally Swallowing Chemicals

- Wash hands before eating and drinking
- Do not eat or drink at the work table
- Do not keep/store food and drink around work area
- Store nail care products in a separate area away from food and the eating area
- Designate a dining area far from chemical storage and work area

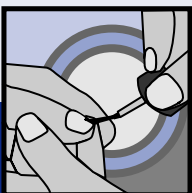
To Ensure Adequate Sanitation

It is important to keep your shop clean. Germs and bacteria can be transferred between customers from dirty nail implements and other supplies used in your shop.

- Use a new towel for each customer



One kind of autoclave that is used to sterilize nail care instruments

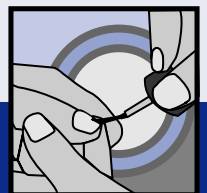


- Wash hands before and after each customer
- Clean and sterilize nail care instruments after each use
- Follow your state Cosmetology Board's instructions on proper sanitation techniques. It is best to sterilize instruments in an autoclave or totally immerse them in an EPA-registered tuberculocidal disinfectant for at least 10 minutes. Less than 10 minutes will not be sufficient for disinfection and instruments should not be used.
- Use disposable implements on only one customer
- Use a new pair of gloves for each customer
- Store nail implements of customers in separate containers
- Do not use sharp instruments to shave calluses. These devices can cause injuries requiring medical attention and have been banned by most state Cosmetology Boards



Other Best Shop Practices

- Do not allow anyone to smoke in your shop because most chemicals stored and used in nail salons are flammable
- Provide training on hazard communication (OSHA 29 CFR 1910.1200) and the proper storage and handling of flammable liquids (OSHA 29 CFR 1910.106) to nail technicians as required by the U.S. Occupational Safety and Health Administration (OSHA)
- Read and understand the state Cosmetology Board's Handbook
- Keep a copy of the most updated state Cosmetology Board's Handbook in the shop
- Keep the latest version of the MSDS for each hazardous chemical stored and used in the salon
- Keep all MSDSs in a binder and store this binder in the same place you store your chemicals
- Read and understand the content of these MSDSs
- Ask nail products suppliers for an MSDS every time nail products are purchased
- Label all containers so that nail technicians can easily identify the contents
- Dispose of liquid waste according to instructions on the product label or MSDS



MASKS AND RESPIRATORS

Why should nail salon workers wear dust masks?

- To minimize breathing in particles
- Refer to page 9 for shop practices that will minimize breathing in vapors because dust masks do not protect against vapors

When should nail salon workers wear dust masks?

- When working with nail powders
- When filing, shaping or buffing artificial nails

Why is it very important to wear the right kind of dust masks?

- Different kinds of masks provide different levels of protection
- One kind of mask will not protect workers from all chemicals used in nail shop

What kind of dust masks should nail salon workers wear?

- Dust masks approved by the National Institute for Occupational Safety and Health (NIOSH)
- Or refer to the MSDS for recommendation on the right kind of masks to wear

Why should nail salon workers wear respirators?

- To prevent breathing in potentially harmful chemical vapors
- Refer to page 9 for more shop practices that will minimize breathing in vapors

When should nail salon workers wear an organic vapor cartridge respirator?

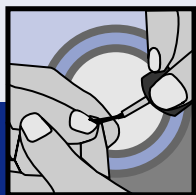
- When working with larger amounts of solvents, such as when transferring chemicals from large to smaller containers

Are there other requirements that nail salon owners and workers must be aware of when using respirators?

- The U.S. Occupational Safety and Health Administration (OSHA) has the Respiratory Protection standard that includes specific requirements such as training, fit testing, care and maintenance, and medical surveillance that shop owners and workers may need to follow when workers wear respirators
- Contact OSHA at (202) 693-1888 or (800) 321-6742 for more information on the requirements that apply to your shop or for a copy of the Respiratory Protection standard (29 CFR 1910.134) and/or the Hazard Communication standard (29 CFR 1910.1200)



Wear an organic vapor cartridge respirator to protect against vapors



Why should nail salon workers wear gloves?

- To prevent chemicals from damaging skin
- To prevent skin from absorbing harmful chemicals which may cause health problems

Why do solvents cause more concerns than other nail salon chemicals?

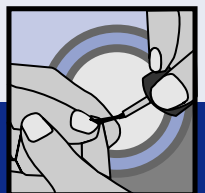
- Skin can easily and quickly absorb solvents
- Solvents damage skin making it easier for other chemicals to enter the body

What kind of gloves should nail salon workers wear?

- Latex or vinyl gloves
- Nitrile gloves or other kind of gloves that provide more protection when working with large amounts of solvents such as when transferring chemicals from large to smaller containers
- Always refer to the MSDS for recommendation on the right kind of gloves to wear

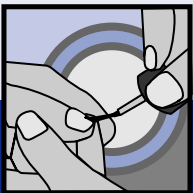
How do nail salon owners and workers find more information about what kind of gloves to wear?

- Call the glove manufacturers and personal protective equipment distributors. Their phone numbers are listed in the phone book. These companies often offer technical advice and free samples
- Ask your shop's nail care products and personal protective equipment vendors



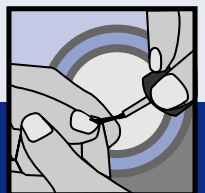
BEST SHOP PRACTICES CHECKLIST FOR OWNERS/MANAGERS

- Post no smoking, no eating and no drinking signs in the shop's work area
- Post a sign near the shop's sink to remind workers to wash their hands before and after each customer
- Post a step-by-step procedure on how to clean and sanitize nail instruments near the shop's sink and in the shop's work area
- Install ventilated table(s) for your shop
- Keep the general ventilation system (HVAC) on during work hours
- Change dust and/or charcoal filters regularly with manufacturer recommended replacement parts
- Place a trash bin (preferably metal) with secure lids at every work station
- Label all chemical containers properly
- Purchase masks and gloves recommended in the MSDS for your technicians
- Do not buy any nail product containing 100 percent liquid methyl methacrylate (MMA) monomer
- Designate a chemical storage area far away from the dining area and equipped with local exhaust ventilation
- Provide an adequately ventilated dining area for nail technicians, partitioned from the shop's work area
- Designate a storage place for a binder of MSDSs for all hazardous chemicals in the shop
- Ask for the most updated MSDS every time nail products are purchased
- Inform employees where MSDSs are kept
- Provide training required for reading and interpreting the MSDSs
- Provide training on hazard communication and proper storage and handling of flammable liquids to nail technicians as required by OSHA
- Maintain a latest copy of the state Cosmetology Handbook



BEST SHOP PRACTICES CHECKLIST FOR WORKERS

- Keep top of ventilated table clear of any obstruction
- Keep nail product bottles closed when not in use
- Get only the amount of chemicals needed per application
- Keep nail products in smaller-sized glass (or nalgene) bottles at work table
- Keep trash bin completely covered at all times
- Place waste soaked with chemicals in a sealed container before disposing them in the trash bin
- Wear mask and gloves recommended in the MSDS when handling chemicals
- Wash hands before and after working on customers
- Wash hands before eating and drinking and after handling chemicals
- Wear long-sleeved clothing
- Do not eat, drink or store food at the work table
- Use a new towel and a new pair of gloves for each customer
- Use disposable nail implements on only one customer
- Clean and sterilize nail care instruments properly after each use
- Do not use sharp instruments to shave calluses
- Do not smoke in the shop
- Read and understand the content of MSDSs
- Know where to find MSDSs in the shop
- Dispose of liquid waste properly



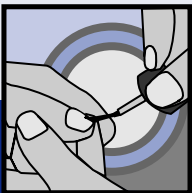
Potential Health Effects of Chemicals Present in Nail Care Products

All health effects were obtained from:

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2. National Institute for Occupational Safety and Health (NIOSH); International Chemical Safety Cards; available at www.cdc.gov/niosh/ipcs/nicstart.html
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4. California Department of Health Services, 1999. Artificial Fingernail Products: A HESIS Guide to Chemical Exposures in the Nail Salon. www.dhs.cahwnet.gov/ohb/hesis/artnails.htm. March 1999, Third Internet printing.

Liquid Methyl Methacrylate (MMA) Monomer

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